



Dev4S4 | S/4HANA Cloud, ABAP Environment Bootcamp for Developers | Partner hands-on workshop

SAP Global Partner Solution Adoption, 2023

Day 1

Starting soon...



THE BEST RUN **SAP**





Dev4S4 | S/4HANA Cloud, ABAP Environment Bootcamp for Developers | Partner hands-on workshop

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Day 1



Day1 Bootcamp Agenda

July 11, 2023

Topic		Duration	Relevance for Public/Private
00. Recap, Work zone, Agenda		10 mins	Both
01. The cloud extensibility model used in SAP S/4HANA Cloud Side-by-side, Key user and In-App Developer Extensibility		20 mins	Both
02. Introduction to SAP S/4HANA Cloud, ABAP Environment ERP extensibility today, ABAP Environment		40 mins	Both
Break		5 mins	
03. RAP Introduction to RAP		60 mins	Both
Break		5 mins	
04. Chat & Work (Live), Landscape overview and access Systems, access, Remote desktop		15 mins	Both
05. Exercise 1 Build a small extension in S/4HANA Cloud		15 mins	Guide for Public, but can be done for Private
Offline exercise work Q&A support via SAP JAM Group		2 Hours	

Day1 Bootcamp Agenda

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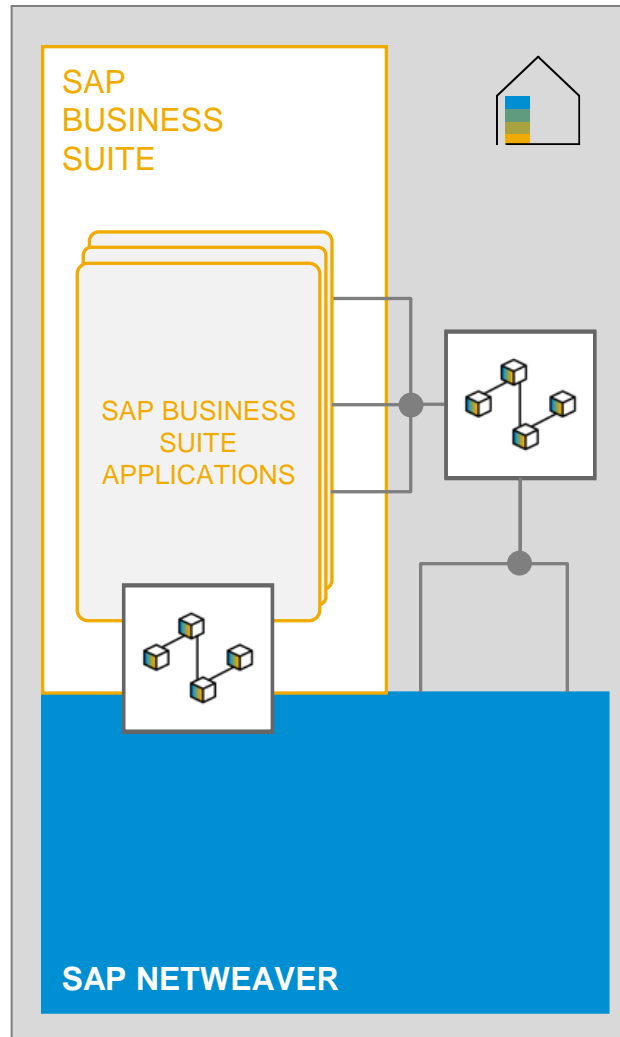
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Classic custom ABAP Code

What is the issue?



Classic Extensibility: Classic custom ABAP code in on-premise



CLASSIC CUSTOM ABAP DEVELOPMENT

Use and modify all SAP objects

ALL SAP OBJECTS CAN BE USED IN CUSTOM CODE

```
10 data mstart type mara mstart.  
11  
12 select single mstart from mara into mstart where
```

SAP OBJECTS CAN BE MODIFIED

```
18 *  
19 *      This form is called from form FV45PF0K  
20 *  
21 *-----  
22 FORM USEREXIT_MOVE_FIELD_TO_KOMK.  
23 *{  INSERT      &S&S&S&S  
24 * If...here I modify the SAP code ...*  
25 *}  INSERT  
26  
27 *      KOMK-zzfield = xxxx-zzfield2.  
28  
29 ENDFORM.  
30 *eject  
31
```

PRO

No restriction for extensions ➡ Extremely flexible and powerful

CON

There is no interface between SAP code and the extension
SAP software changes lead to high test and adaptation efforts

➡ SAP upgrade effort increases and agility/innovation speed decreases

New rules for extensions to support smooth SAP software updates

In the **public cloud**, SAP software updates run automated and for all tenants in parallel

THERE IS NO CUSTOMER SPECIFIC UPGRADE PROJECT

RULE for smooth software updates

Extensions must be clearly separated from SAP code

No modifications to SAP objects allowed

Only stable public SAP APIs (local or remote) and SAP extension points can be used

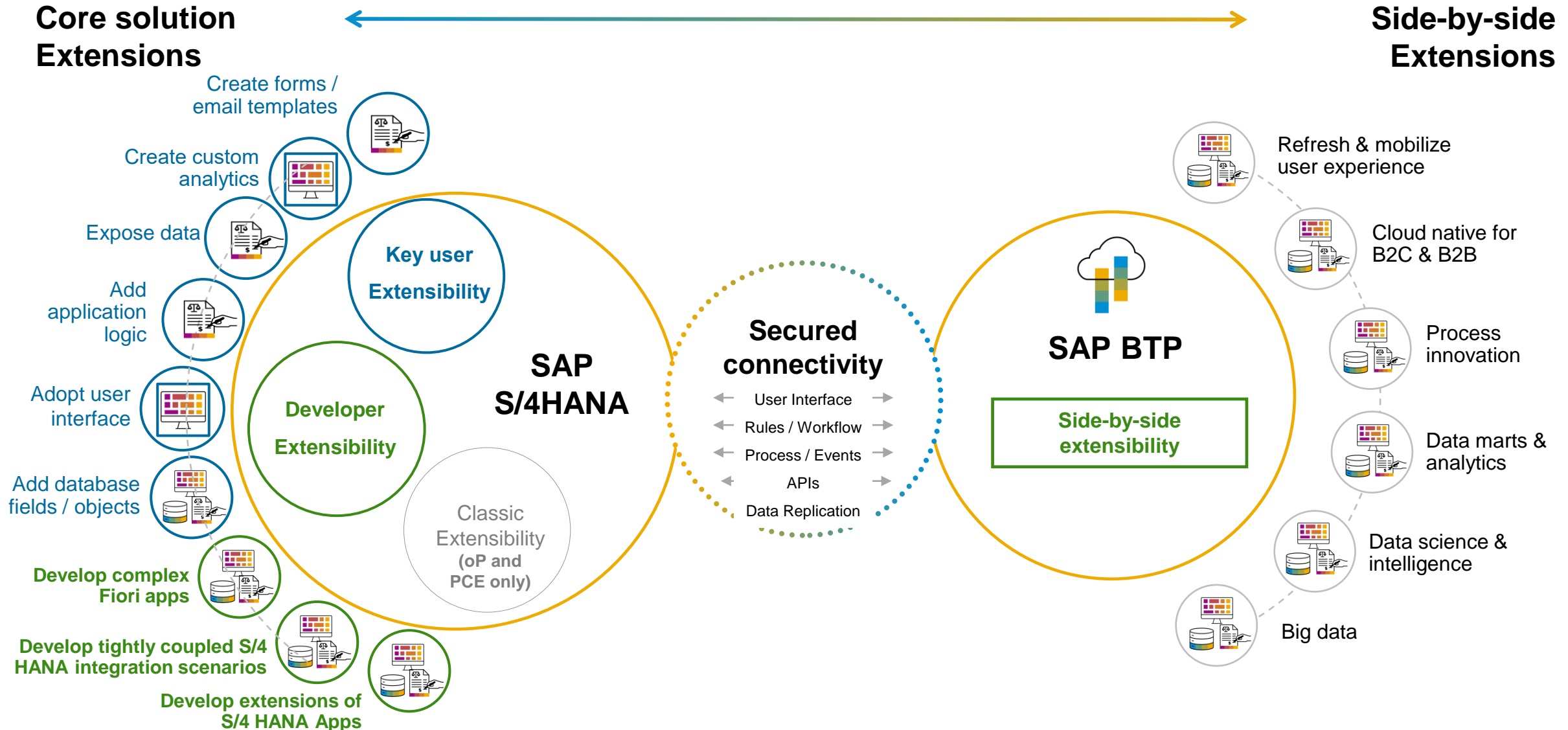
Mandatory in public cloud

Recommended in private cloud and on-premise

The SAP S/4HANA Cloud Extensibility Model



SAP S/4HANA extensibility



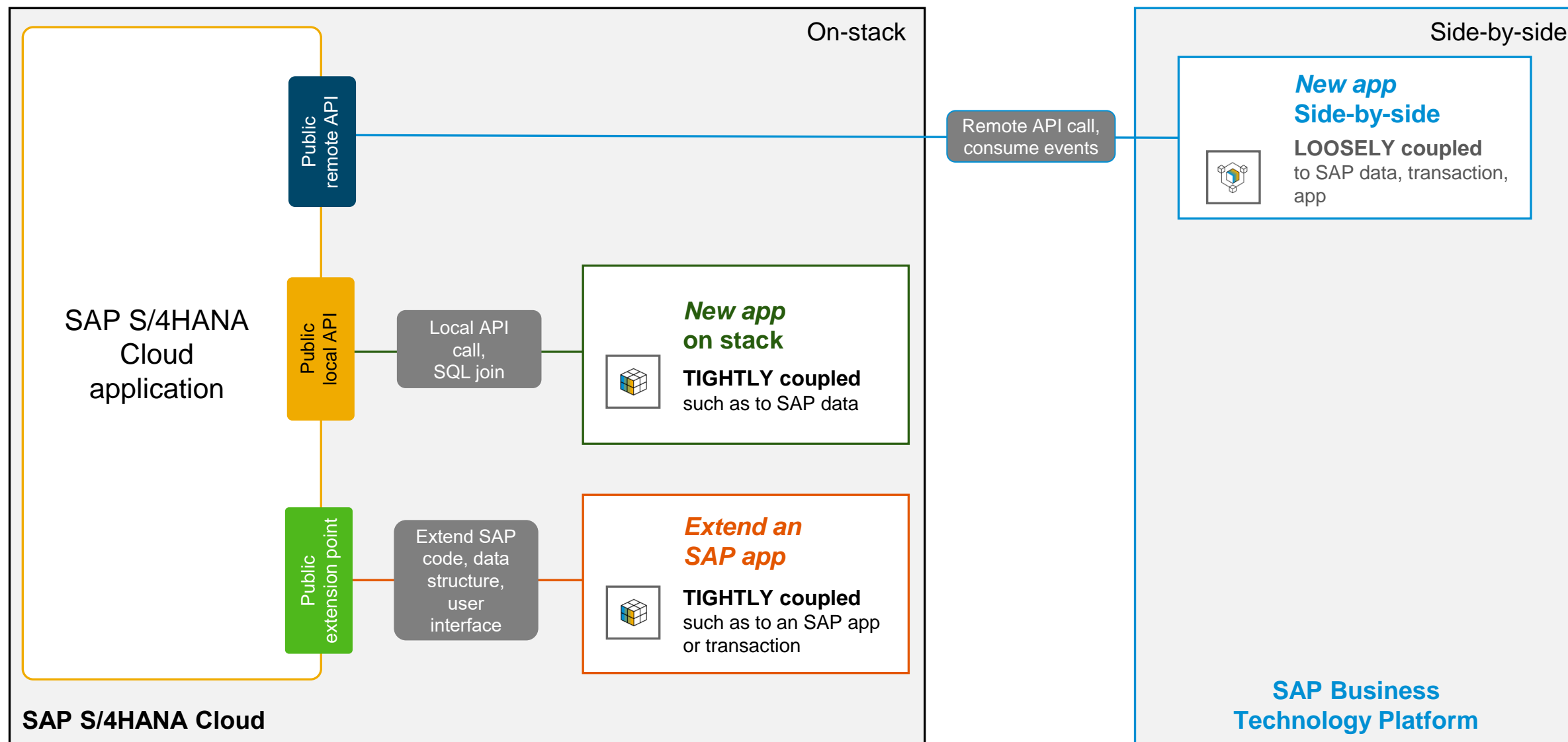


Loosely coupled

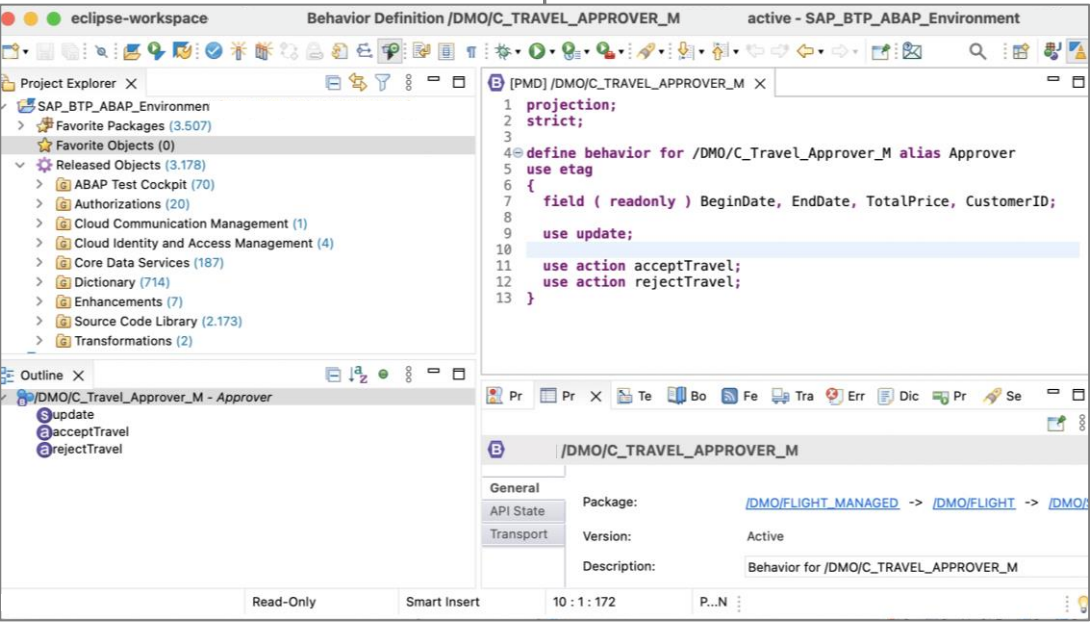
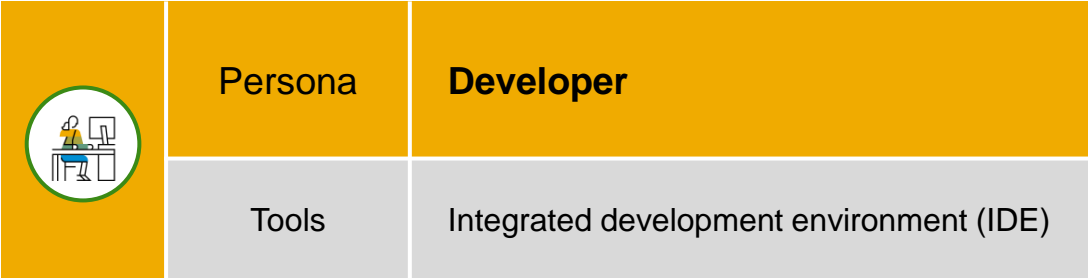
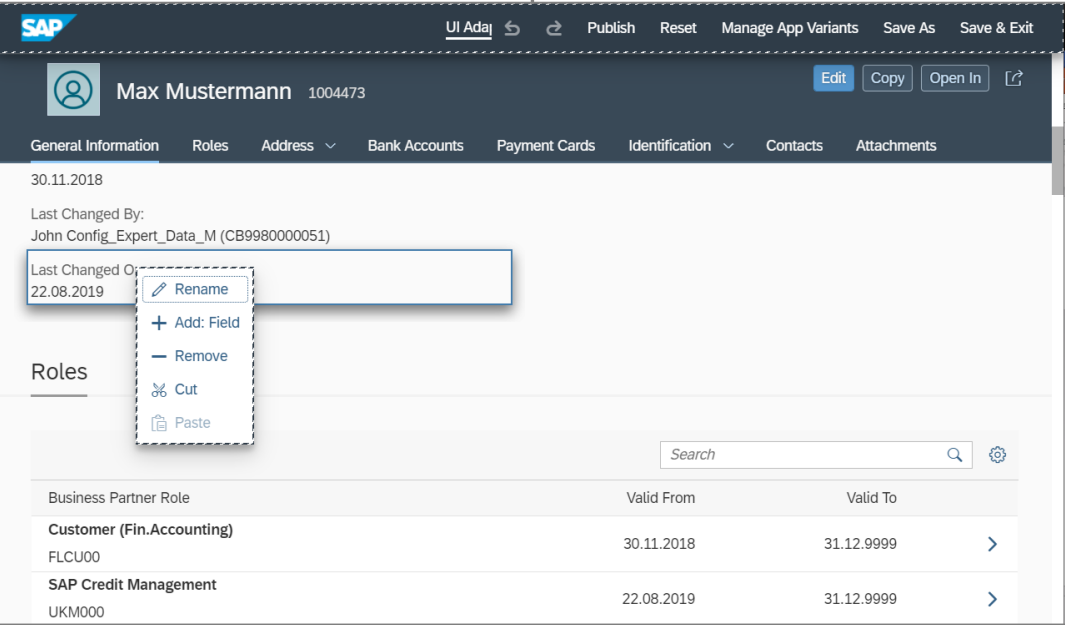
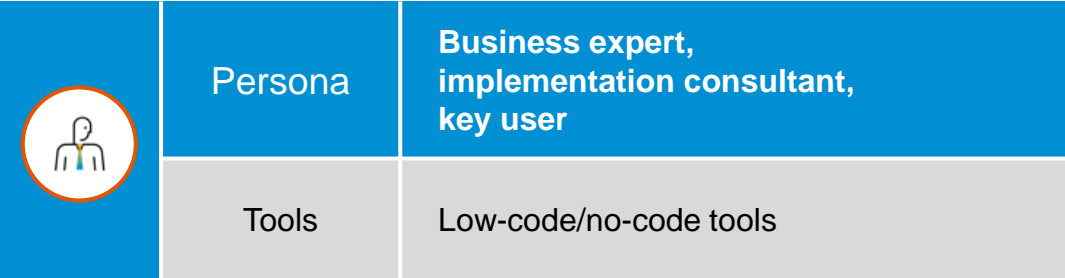


Tightly coupled

SAP S/4HANA Cloud extensibility patterns



Extensibility personas



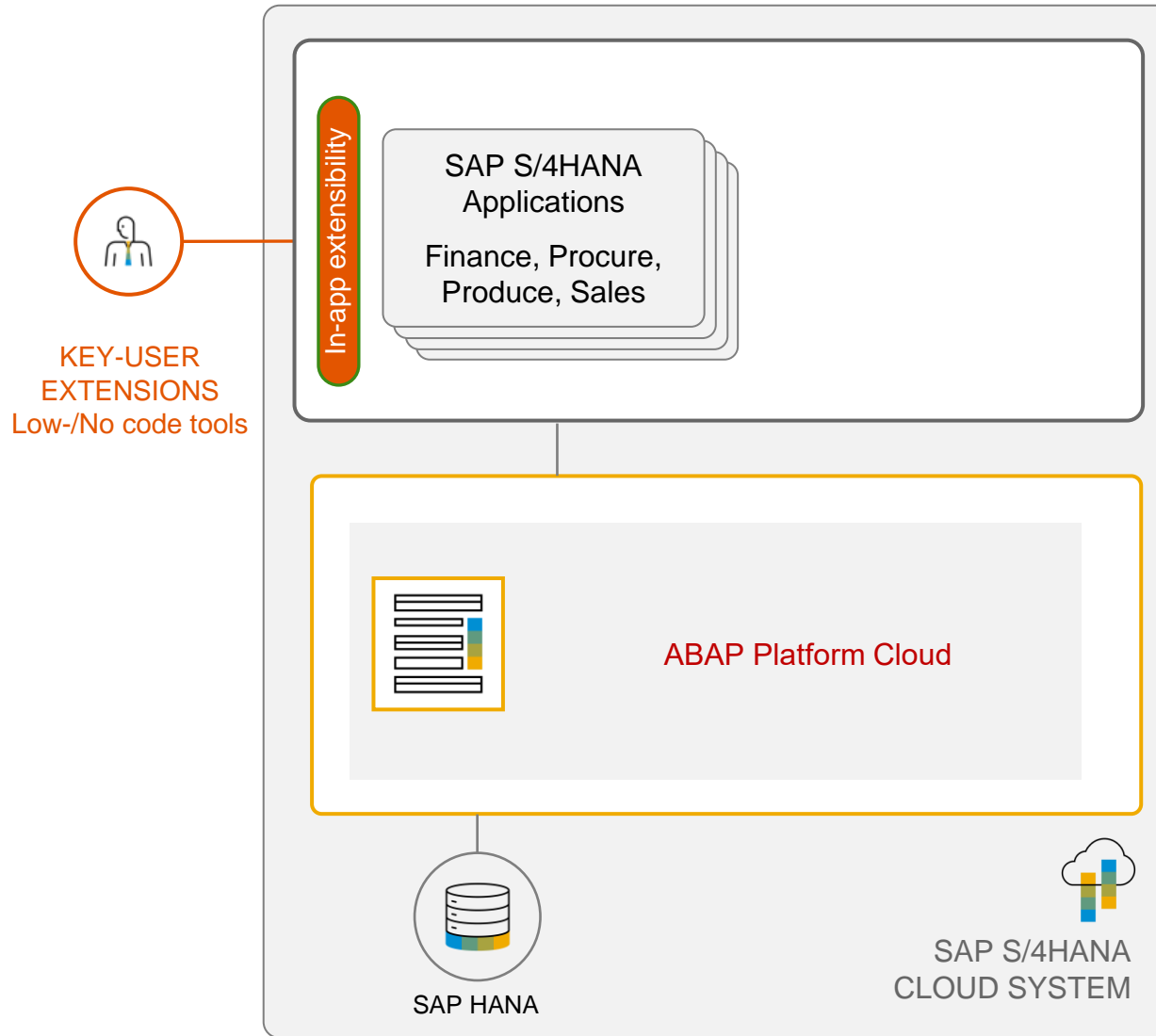
SAP S/4HANA Cloud extensibility portfolio

	On-stack extensions on SAP S/4HANA Cloud	Side-by-side extensions on SAP BTP
Business expert Key user	SAP S/4HANA Cloud key-user tools	SAP Build Apps, SAP Business Application Studio, SAP Build Process Automation, and others
Developer	SAP S/4HANA Cloud, ABAP environment	Java, Node.js, or the ABAP environment

Only upgrade-stable and cloud-ready custom ABAP code is allowed

Use ABAP Cloud !

SAP S/4HANA Cloud extensibility today - Key user extensibility



EXAMPLE: FIELD EXTENSIBILITY

Create and maintain custom fields that can be used to enhance applications and APIs

Choose different data types (e.g., Number, Text)

Custom fields can be used in applications and their UIs, Reports, Email templates, Form Templates, OData APIs and other

New Field

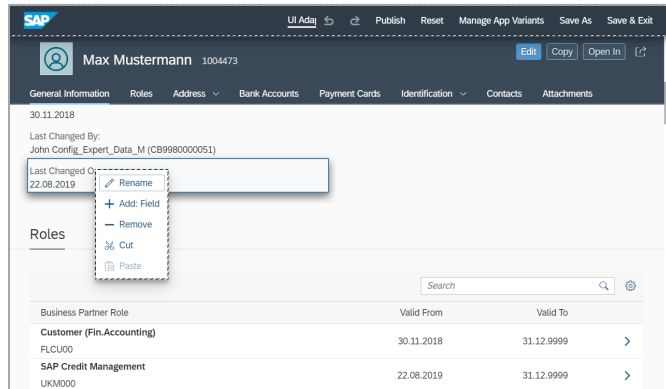
Field Properties

*Business Context:	Sales: Sales Document Item	▼
*Label:	SalesDocumentExtensionTest	
*Identifier:	YY1_	SalesDocumentExten
*Tooltip:	SalesDocumentExtensionTest	
*Type:	Text	▼
*Length:	20	

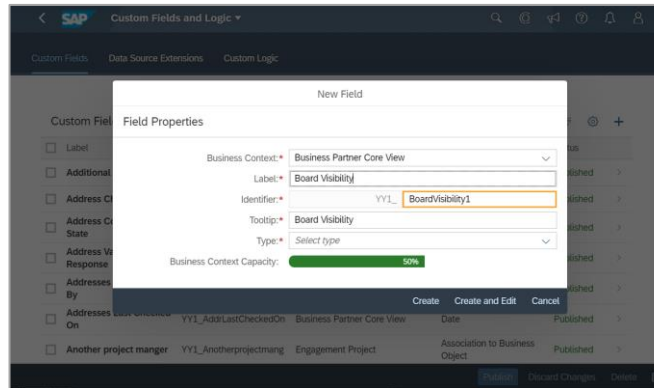
Business Context Capacity: 6%

Create Create and Edit Cancel

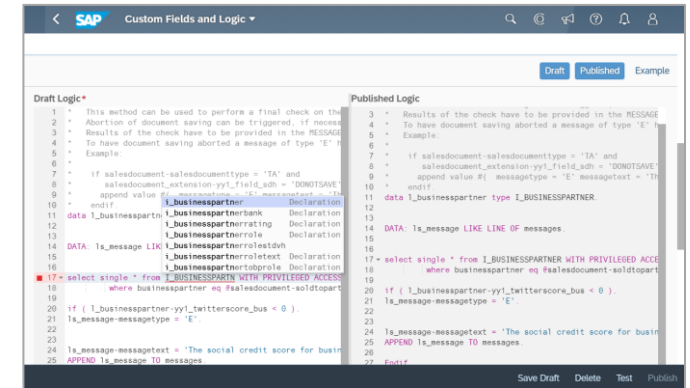
Examples for key-user tools



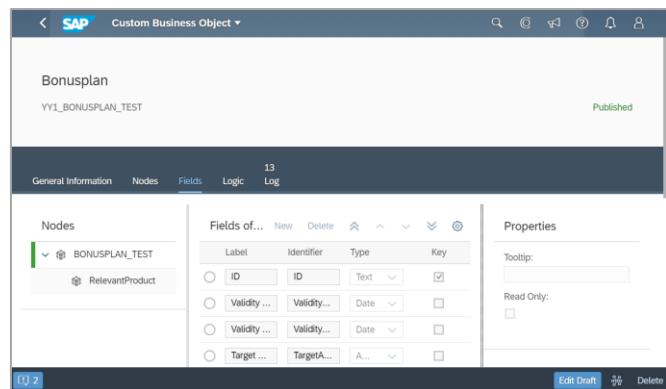
UI adaptation mode – Adaptation mode with drag-and-drop configuration



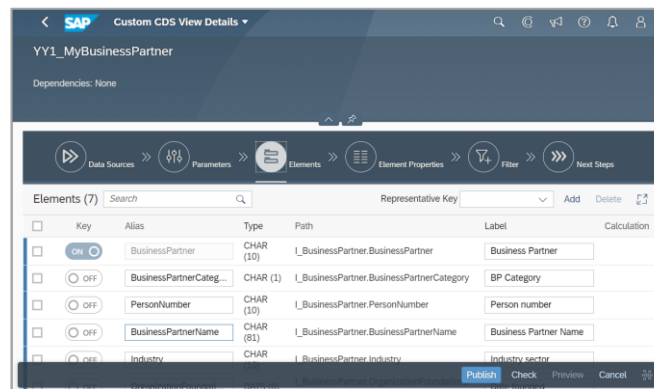
Custom fields, SAP Fiori app



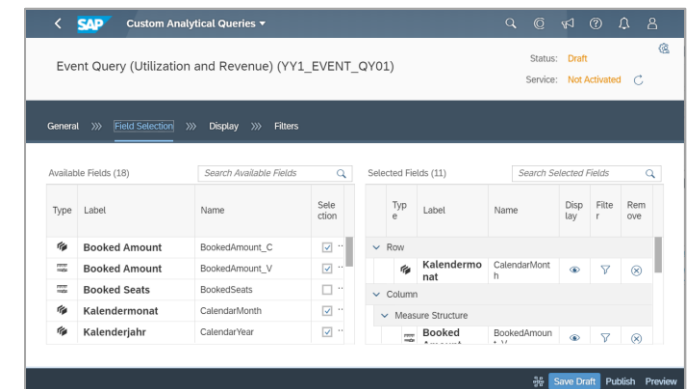
Custom business logic, SAP Fiori app



Custom business objects, SAP Fiori app

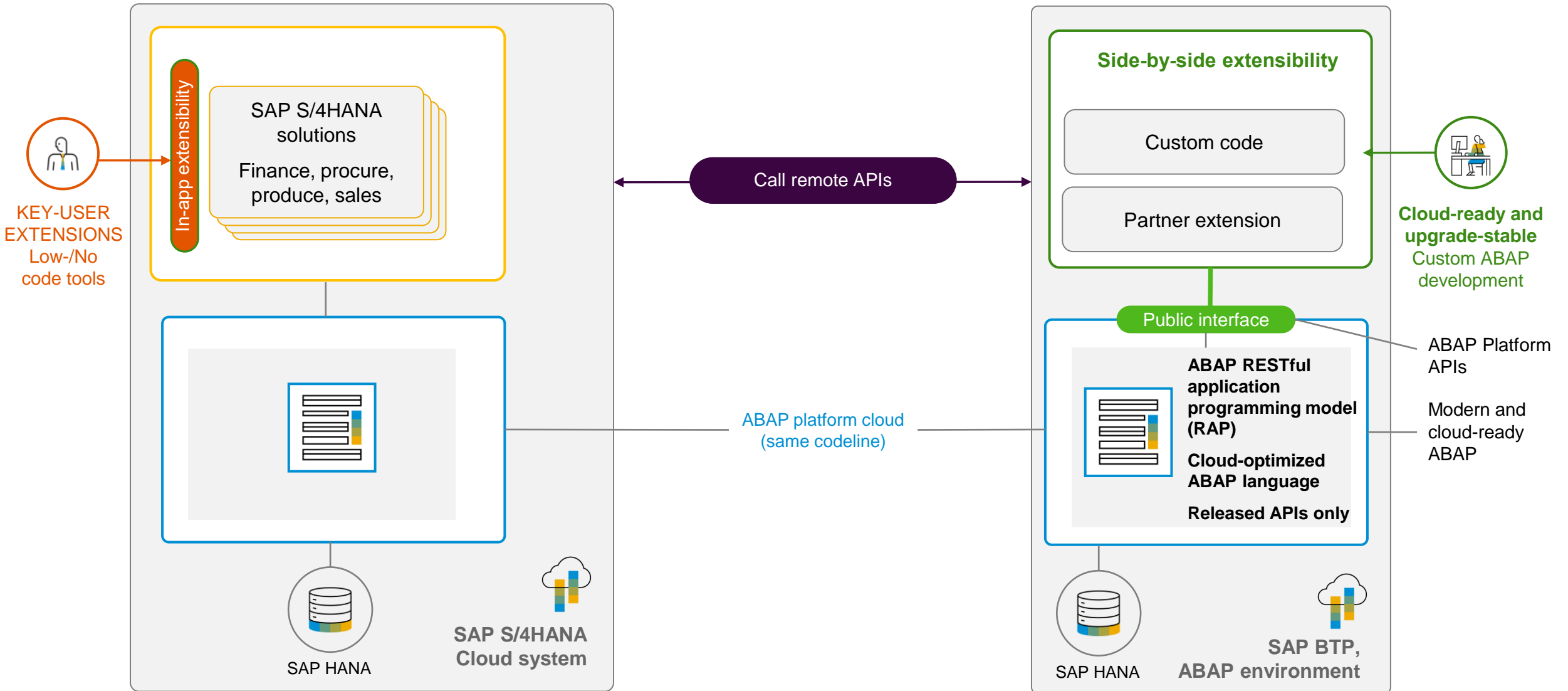


Custom CDS views, SAP Fiori app

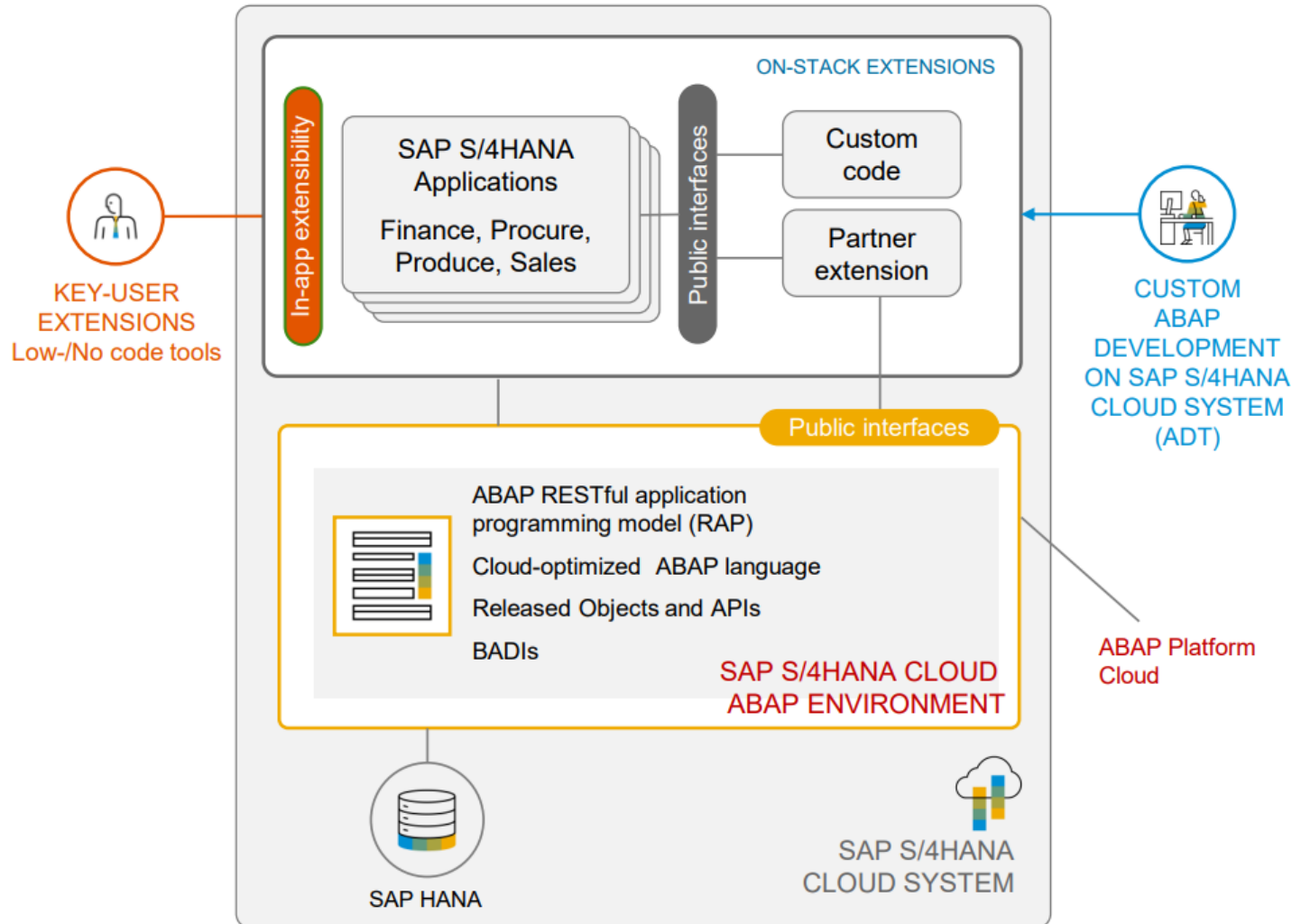


Custom analytical queries, SAP Fiori app

SAP S/4HANA Cloud extensibility today – Side by Side Extensibility



NEW: SAP S/4HANA Cloud ABAP Environment (Embedded Steampunk)



**ENABLE CUSTOM ABAP DEVELOPMENT
DIRECTLY ON SAP S/4HANA CLOUD STACK**

MODERN ABAP DEVELOPMENT

**SAP, customers and partners use the same
development model**

High developer productivity

ABAP RESTful application programming model

- Development of SAP HANA-optimized apps and services
- Eclipse-based ABAP development tools

SAP Fiori tools for UI Development

Proven Lifecycle Management

RULES OF THE GAME

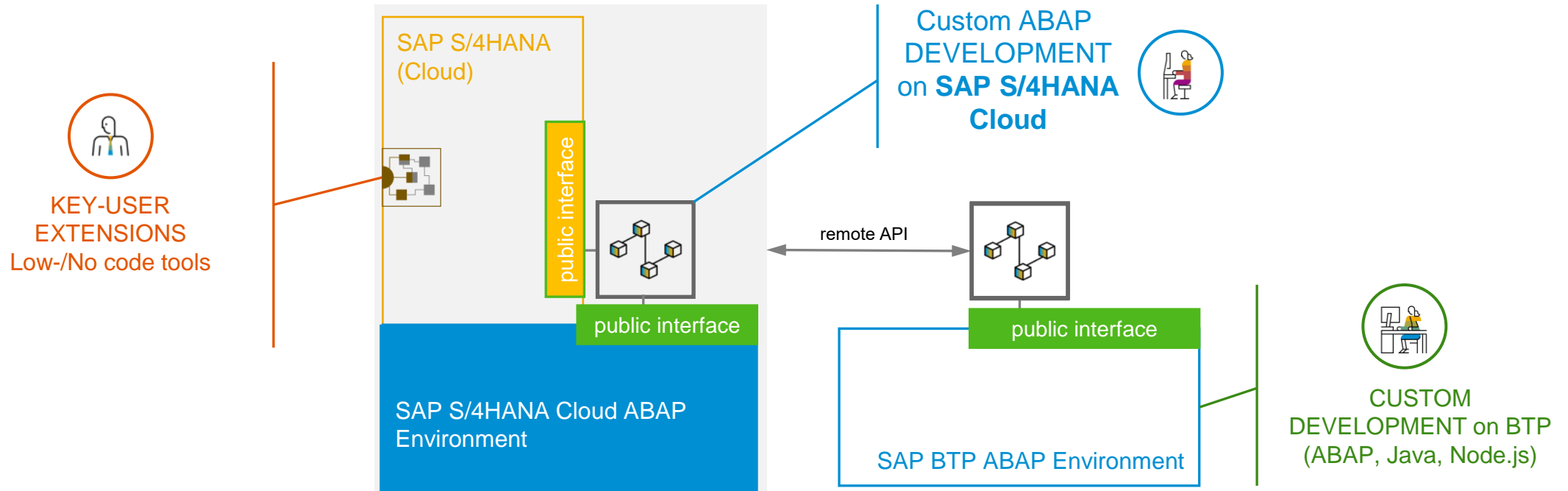
- Clear separation between SAP solutions and extensions
- Only stable and reliable public interfaces and released objects from both ABAP platform and SAP S/4HANA Cloud applications can be used
- No modifications

NOW: One common Extensibility model for cloud and on premise



On-stack extensibility

Side-by-side extensibility



Rich and flexible cloud extensibility

Keep the popular key-user extensibility for business users

Use side-by-side extensibility for decoupled extension scenarios and partner SaaS solutions

Add on-stack developer extensibility with ABAP development tools

Extensibility concept - *Embedded Steampunk: The developer perspective*

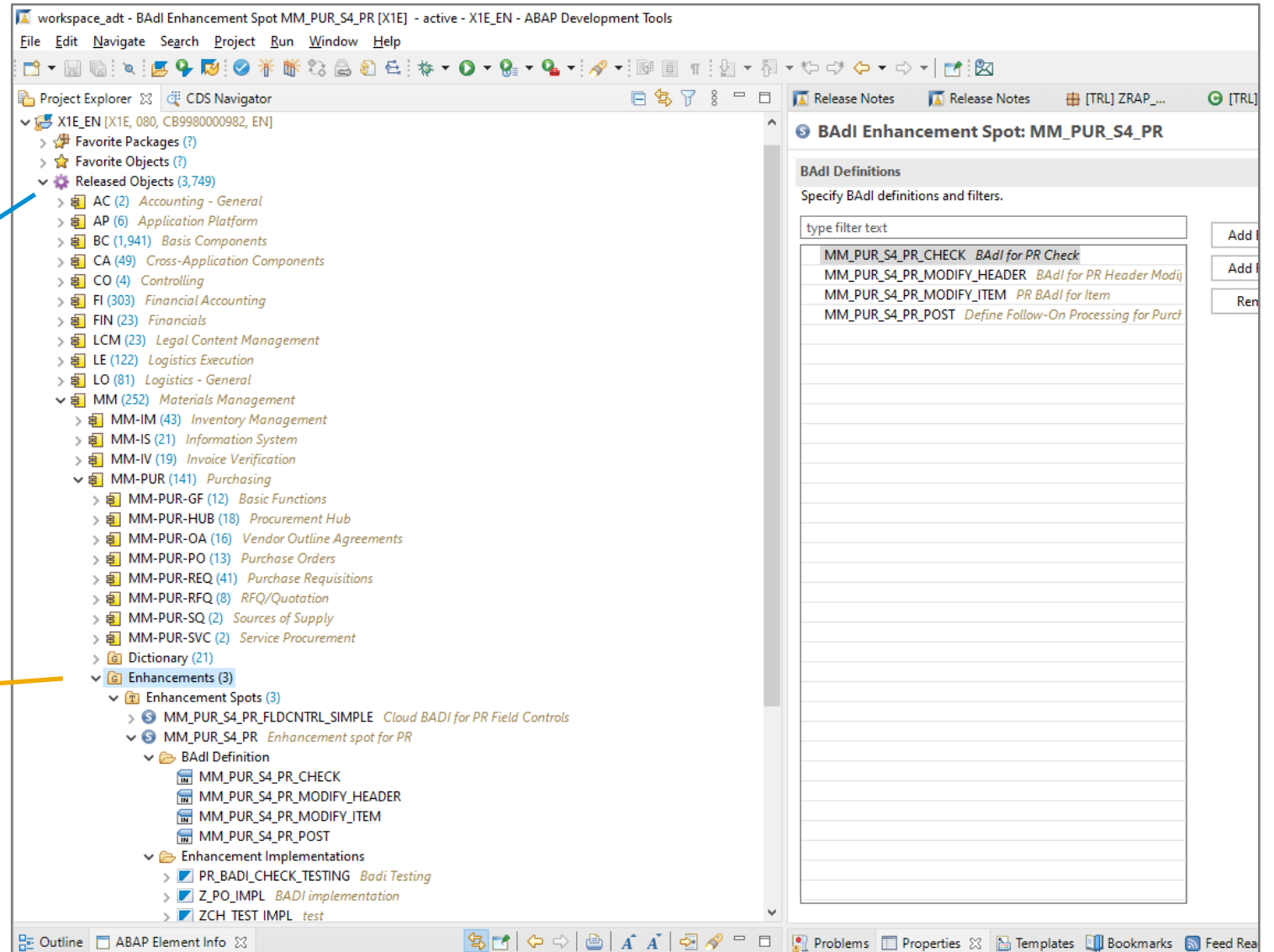
PUBLIC APIS / RELEASED OBJECTS

Clean core

Modification-free extension
development

FEATURE RICH TOOL SUPPORT

Search and identification of public API
through browsing by application
component



Released RAP facades

- ▼ Behavior Definitions (54)
 - ▶ L_BILLOFMATERIALTP_2 Bill Of Material
 - ▶ L_BUSINESSSOLUTIONORDERTP Business Solution Order
 - ▶ L_CADOCUMENTTP Contract Accounting Document
 - ▶ L_CENTRALSUPPLIERQUOTATIONTP_2 Central Supplier Quotation
 - ▶ L_CNTRLPURCHASECONTRACTTP_2 Central Purchase Contract
 - ▶ L_CNTRLREQUESTFORQUOTATIONTP_2 Central Request For Quotation
 - ▶ L_CREDITMEMOREQUESTTP Credit Memo Request
 - ▶ L_CUSTOMERRETURNTTP Customer Return
 - ▶ L_DEBITMEMOREQUESTTP Debit Memo Request
 - ▶ L_ENTERPRISEPROJECTTP_3 Enterprise Project
 - ▶ L_FINTRANSINTRSTRATEINSTRTTP Interest Rate Instrument
 - ▶ L_FUNCTIONALLOCATIONTP Functional Location
 - ▶ L_HANDLINGUNITTP Handling Unit
 - ▶ L_JOURNALENTRYTP Journal Entry
 - ▶ L_LEGALDOCUMENTTP Manage Legal Documents
 - ▶ L_LEGALTRANSACTIONTP_2 Manage Legal Transaction
 - ▶ L_MAINTENANCEITEMTP_2 Maintenance Item
 - ▶ L_MAINTENANCEPLANTTP_2 Maintenance Plan
 - ▶ L_MAINTORDERCONFIRMATIONTP Maintenance Order Confirmation
 - ▶ L_MATERIALDOCUMENTTP Material Document Interface BDEF
 - ▶ L_MEASUREMENTDOCUMENTTP_2 Measurement Document
 - ▶ L_MEASURINGPOINTTP_2 Measuring Point
 - ▶ L_MODELPRODUCTSPECIFICATIONTP Model Product Specification
 - ▶ L_PHYSICALINVENTORYDOCUMENTTP Physical Inventory Document
 - ▶ L_PLNDINDEPRQMTTP Planned Independent Requirements
 - ▶ L_PROCESSORDERCONFIRMATIONTP Process Order Confirmation
 - ▶ L_PRODUCTIONORDCONFIRMATIONTP Production Order Confirmation
 - ▶ L_PRODUCTIONSUPPLYAREATP_2 ProductionSupplyArea Interface
 - ▶ L_PRODUCTTP_2 Product
 - ▶ L_PURCHASECONTRACTTP Purchase Contract
 - ▶ L_PURCHASEORDERTP_2 Purchase Order Projection
 - ▶ L_PURCHASEREQUISITIONTP Purchase Requisition
 - ▶ L_PURCHASINGINFORECORDTP Purchasing Info Record
 - ▶ L_PURGQUOTAARRGMTTP_2 Quota Arrangement
 - ▶ L_QLTYNOTIFICATIONTP Quality Notification
 - ▶ L_REQUESTFORQUOTATIONTP Request For Quotation
 - ▶ L_RESERVATIONDOCUMENTTP Reservation Document Interface
 - ▶ L_SALESCONTRACTTP Sales Contract
 - ▶ L_SALESORDERTP Sales Order
 - ▶ L_SALESQUOTATIONTP Sales Quotation
 - ▶ L_SCHEDGAGRMTHDRTP_2 Purchasing Scheduling Agreement
 - ▶ L_SERVICECONFIRMATIONTP Service Confirmation
 - ▶ L_SERVICECONTRACTTP Service Contract
 - ▶ L_SERVICEENTRYSHEETTP_2 Service Entry Sheet
 - ▶ L_SERVICEORDERTP Service Order
 - ▶ L_SERVICEQUOTATIONTP Service Quotation
 - ▶ L_SUPLREVALUSRDFNDCRITERIATP_2 Manage User Defined Criteria
 - ▶ L_SUPPLIERINVOICETP Supplier Invoice
 - ▶ L_SUPPLIERQUOTATIONTP Supplier Quotation
 - ▶ L_SUPPLYDEMANDITEMTP Interface for SupplyDemandItem
 - ▶ L_VARCNFOBJECTDEPENDENCYTP Variant Configuration Object Dependency
 - ▶ L_VARCNFPRODUCTPROFILETP Variant Configuration Profile
 - ▶ L_VARCNFIGTABLECONTENTTP Variant Configuration table content
 - ▶ L_VARCNFIGTABLETP Variant Configuration Table

D [CWR] I_PRODUCT	
General	▼ Use System-Internally (Contract C1)
Specific	Release state: Released
API State	Visibility
Transport	<input checked="" type="checkbox"/> Use in Cloud Development
	<input checked="" type="checkbox"/> Use in Key User Apps

SAP released the CDS view for *ABAP cloud development*

ABAP Cloud – IDE and API examples for on-stack developer extensibility

Custom ABAP on SAP S/4HANA Cloud

ABAP development tools in Eclipse
Cloud-optimized ABAP language
Proven ABAP transport management

Access to public SAP APIs ONLY – otherwise, syntax error!

No access to old Dynpro APIs
No direct select on the MARA table from SAP

Local APIs from SAP S/4HANA

SELECT products from
SAP S/4HANA tables using the public
I_Product CDS view

```
1 CLASS zcl_bgtest DEFINITION
2   PUBLIC
3   FINAL
4   CREATE PUBLIC.
5
6   PUBLIC SECTION.
7     INTERFACES if_oo_adt_classrun.
8   PROTECTED SECTION.
9   PRIVATE SECTION.
10  ENDClass.
11
12
13 CLASS zcl_bgtest IMPLEMENTATION.
14
15   METHOD if_oo_adt_classrun~main.
16
17     SELECT CountryName FROM I_CountryText WHERE Language = @sy-langu ORDER BY CountryName INTO @DATA(l_countryname).
18     out->write( l_countryname ).
19     ENDSELECT.
20
21     CALL FUNCTION 'POPUP_TO_CONFIRM'.
22     SELECT matnr FROM mara INTO TABLE @DATA(l_matnr).
23
24     SELECT ProductExternalID FROM I_Product INTO TABLE @DATA(l_matnr_new).
25
26   ENDMETHOD.
27
28 ENDClass.
```

Global Class | Class-relevant Local Types | Local Types | Test Classes | Macros

Problems | Properties | Templates | Bookmarks | Feed Reader | Transport Organizer | Error Log | Search | Console

3 errors, 0 warnings, 0 others

Description	Resource	Path	Location	Type
Errors (3 items)				
The use of Function Module POPUP_TO_CONFIRM is not permitted.	zcl_bgtest.aclass	/CWR_EN/.adt/classli...	line 21	ABAP Syntax C...
Use of Table MARA is not permitted. See object documentation for replacement.	zcl_bgtest.aclass	/CWR_EN/.adt/classli...	line 22	ABAP Syntax C...

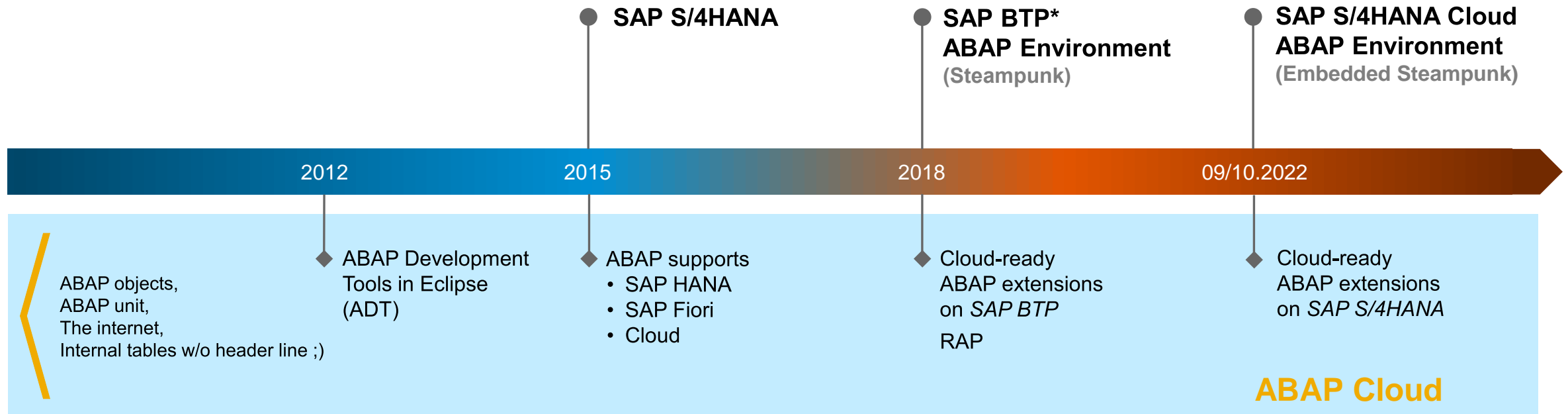
ABAP Cloud



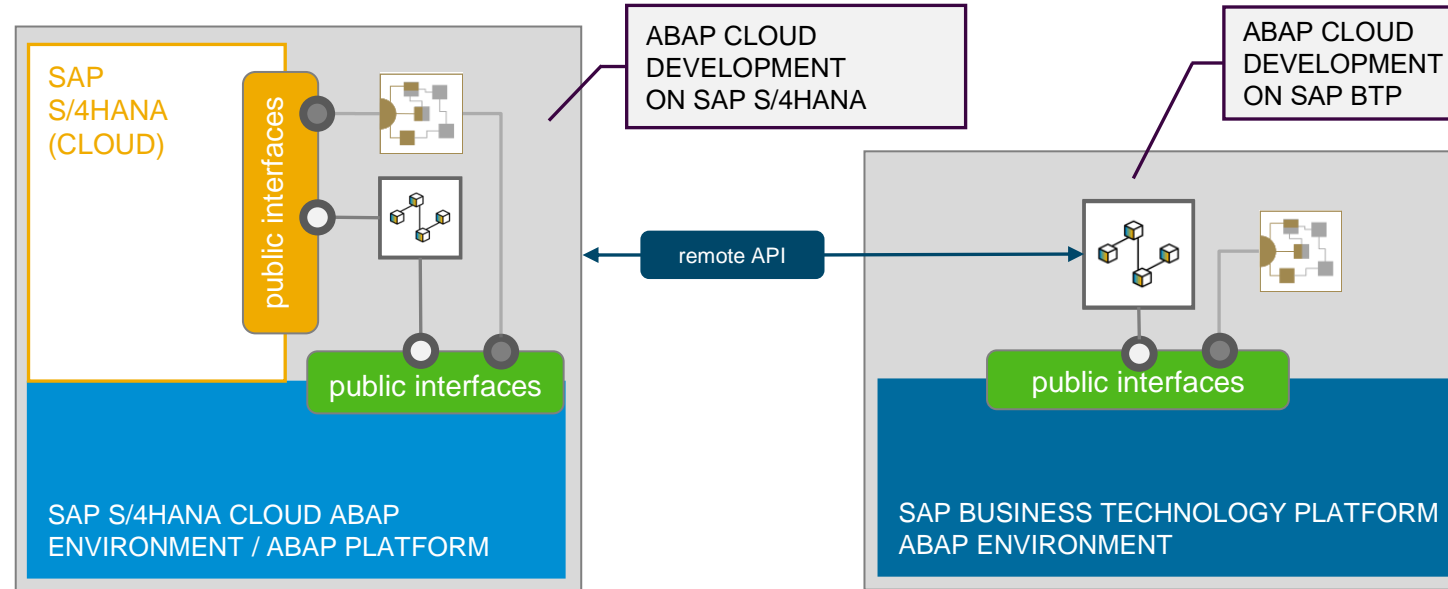
ABAP Cloud

- ... is the ABAP **development model** to build cloud-ready business apps, services or extensions
- ... comes with SAP BTP and SAP S/4HANA
- ... works with public or private cloud, and even on-premise

The evolution to ABAP Cloud



Availability of ABAP Cloud



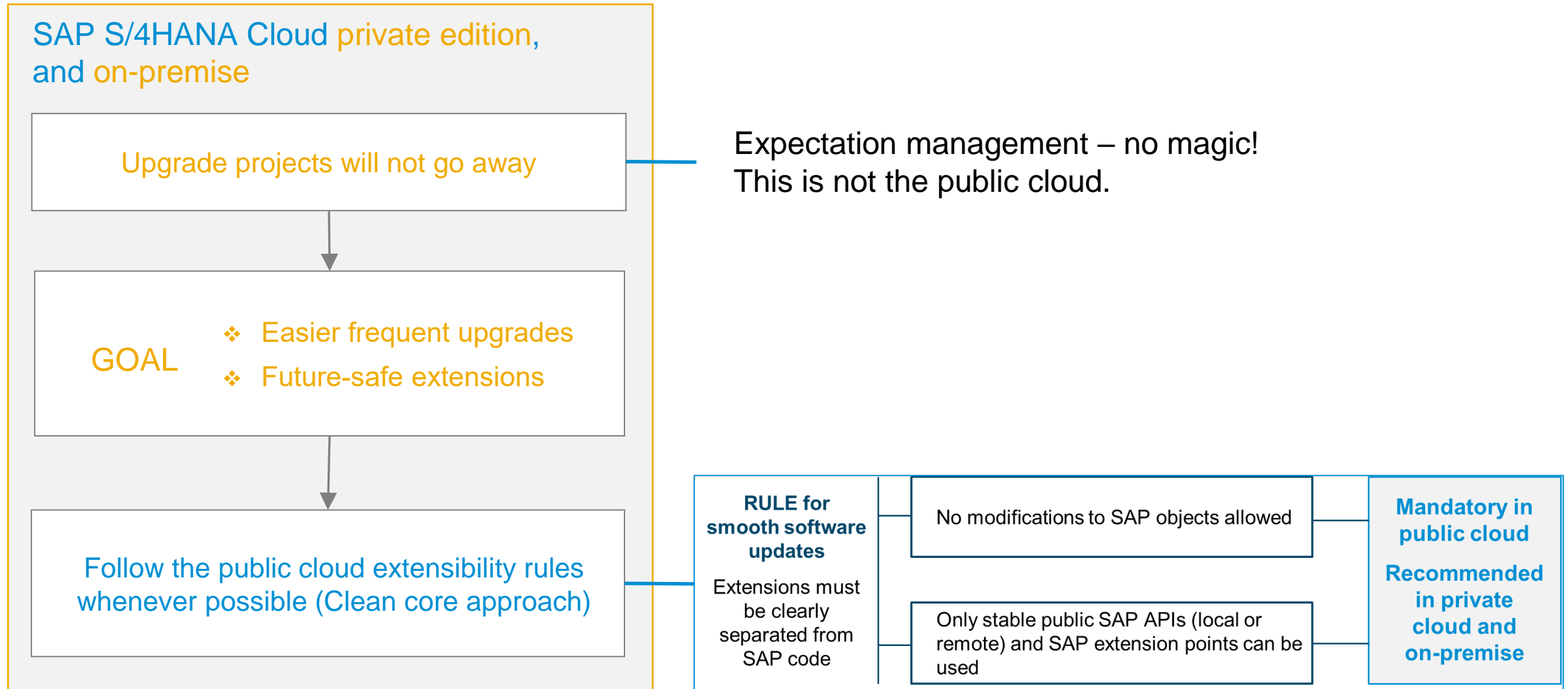
ABAP CLOUD IS AVAILABLE IN THE FOLLOWING PRODUCTS

PRODUCT	RELEASE	ABAP Cloud versus classic ABAP
SAP BTP ABAP Environment	All	Only ABAP Cloud is available
SAP S/4HANA Cloud, public edition	≥ 2208 (new customers)	Only ABAP Cloud is available
SAP S/4HANA Cloud, private edition and SAP S/4HANA on-premise	≥ 2022	ABAP Cloud is recommended Classic ABAP can still be used

**What about the private cloud and on-premise editions of SAP S/4HANA?
Here we need smoother upgrades as well**

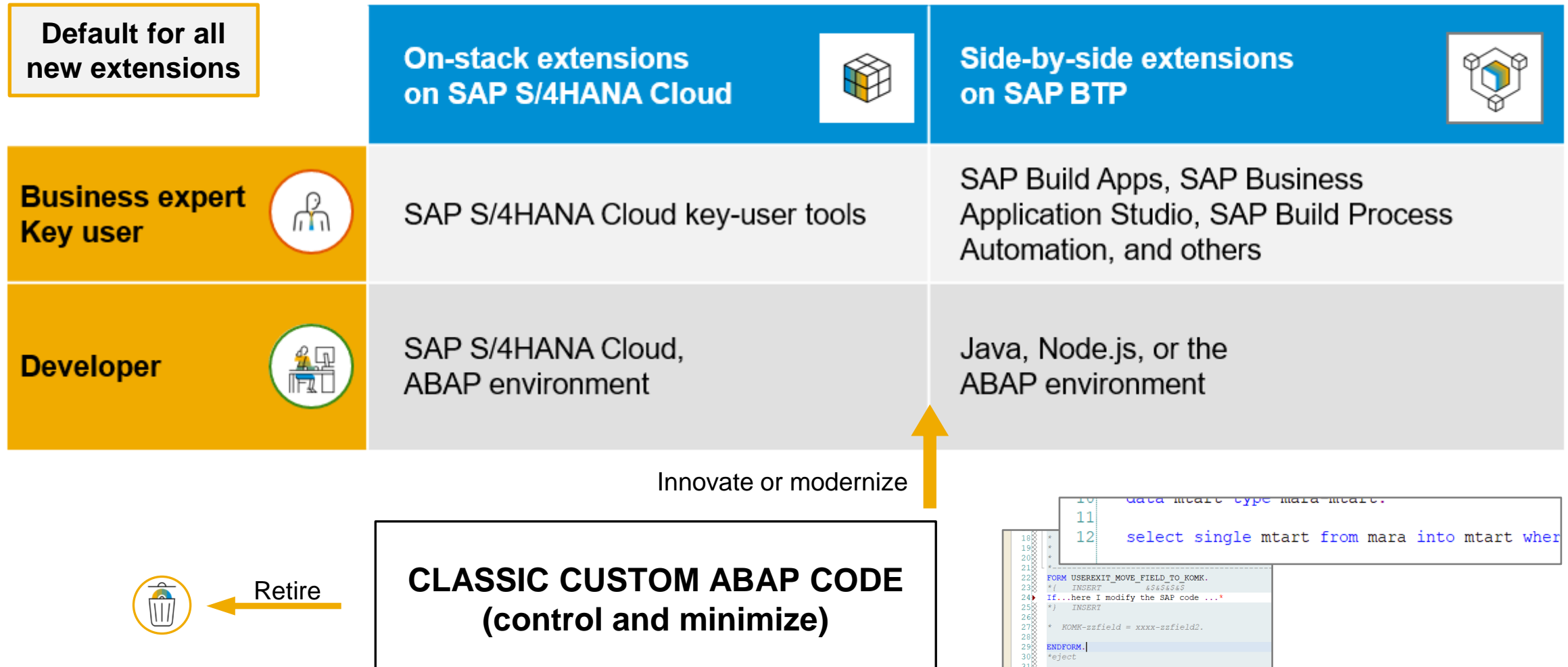


Clean core rules for extensions to support smoother SAP software updates



SAP S/4HANA, private cloud and on-premise editions

Reuse the SAP S/4HANA Cloud extensibility model

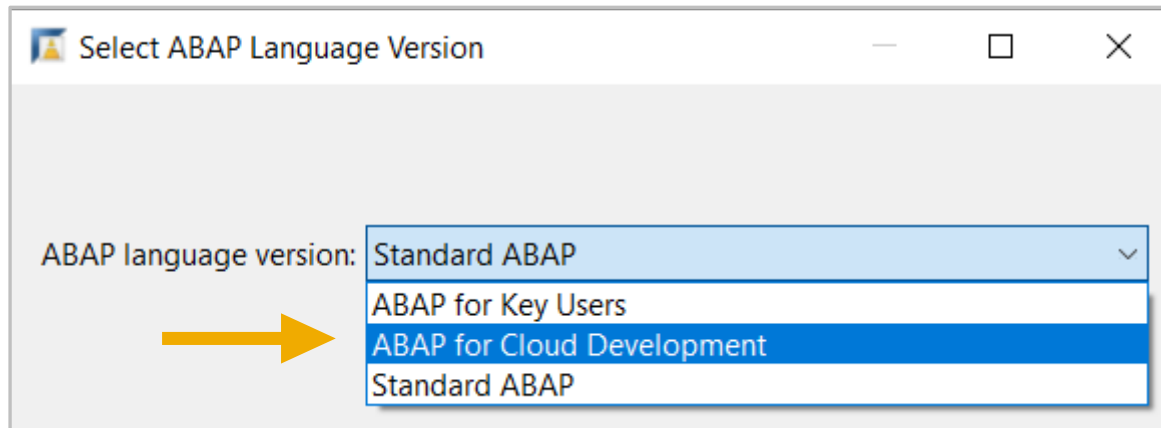


SAP S/4HANA, private cloud and on-premise editions

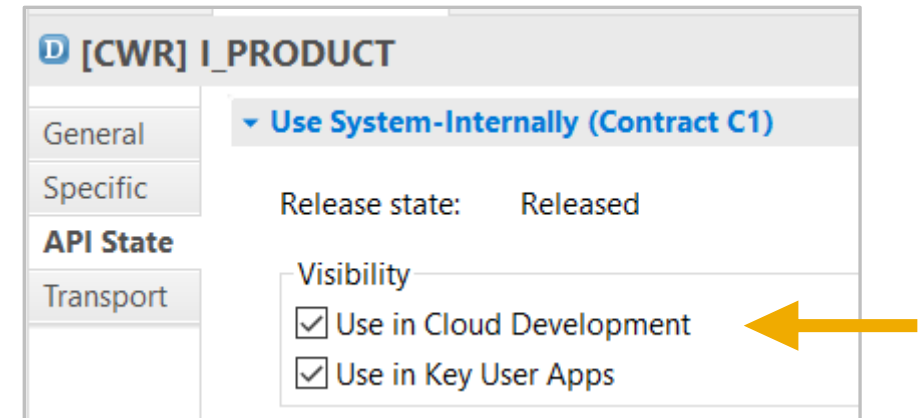
ABAP Cloud development – ABAP language version and public SAP APIs

How will I use **ABAP Cloud** in the private cloud and on-premise editions of SAP S/4HANA?

- ❖ Switch on the strict ABAP Cloud syntax check for the selected custom ABAP objects (such as a new Z-class)
- ❖ Use the public APIs that SAP released for ABAP cloud development (such as the CDS view I_PRODUCT)

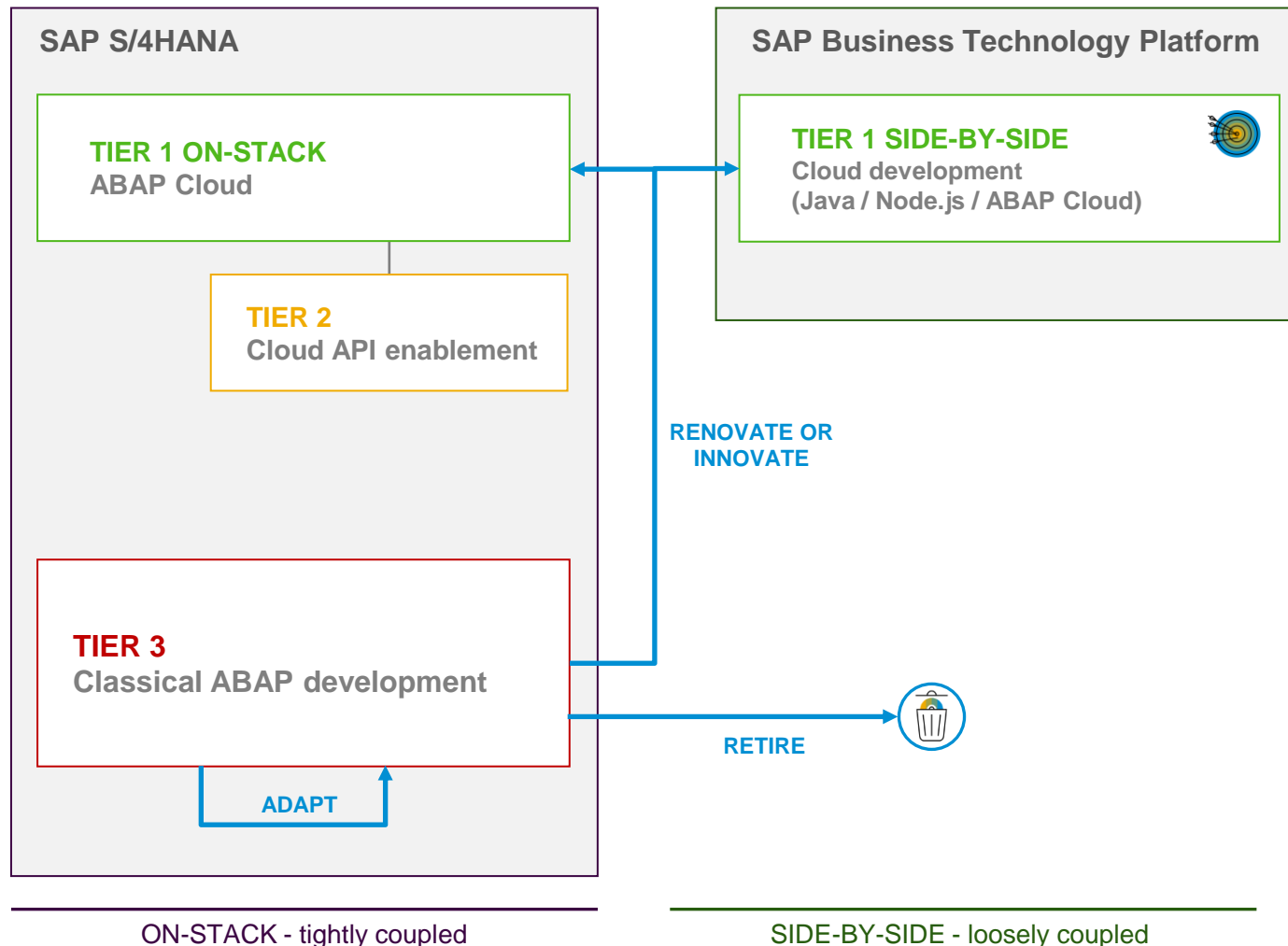


Switch from classic ABAP extensibility (Standard ABAP) to ABAP Cloud (ABAP for cloud development)



SAP released the CDS view for *ABAP Cloud development*

3-tier extensibility model for SAP S/4HANA private cloud and on-premise



TIER 1 – Cloud extensibility model

Cloud-ready and upgrade-stable development of new applications and extensions. ABAP Cloud is mandatory – no classic ABAP in tier 1.

Same extensibility model as used in SAP S/4HANA Cloud, public edition

Default for new extensions and custom apps

TIER 2 – Cloud API enablement

Extends and enables tier 1 for private cloud and on-premise
Mitigates missing public SAP APIs or extension points:

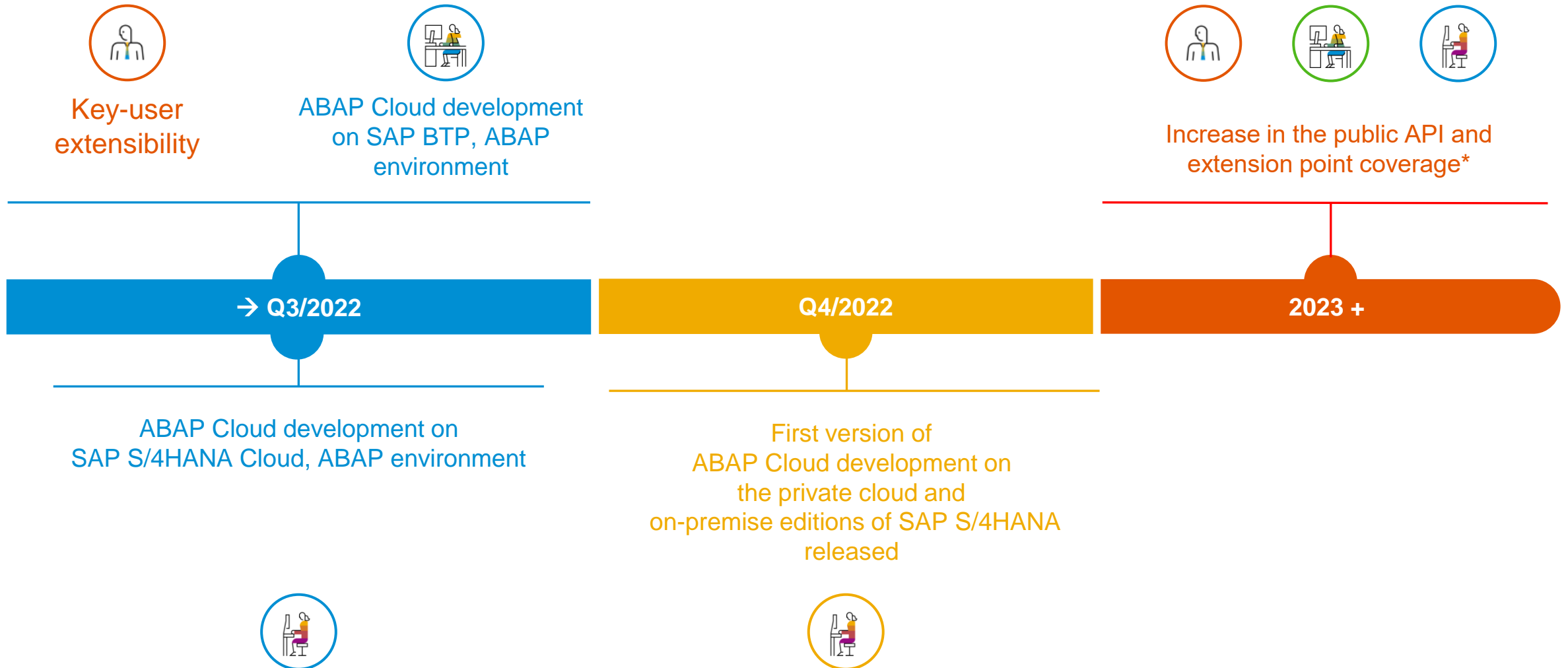
- Develop custom wrapper objects for not released SAP objects to be used in tier 1
- Retire wrapper once a released SAP API is available

TIER 3 – Classic ABAP extensions

Legacy/existing custom ABAP code or new on-stack extensions code that cannot follow the rules of tier 1 and 2

Avoid and reduce the content in tier 3

Road map – ABAP extensibility options



Extensibility options for S/4HANA - When to Use What



Big Picture - SAP S/4HANA Public Cloud Extensibility

EXTENSIBILITY INTEGRATED IN SAP S/4HANA CLOUD

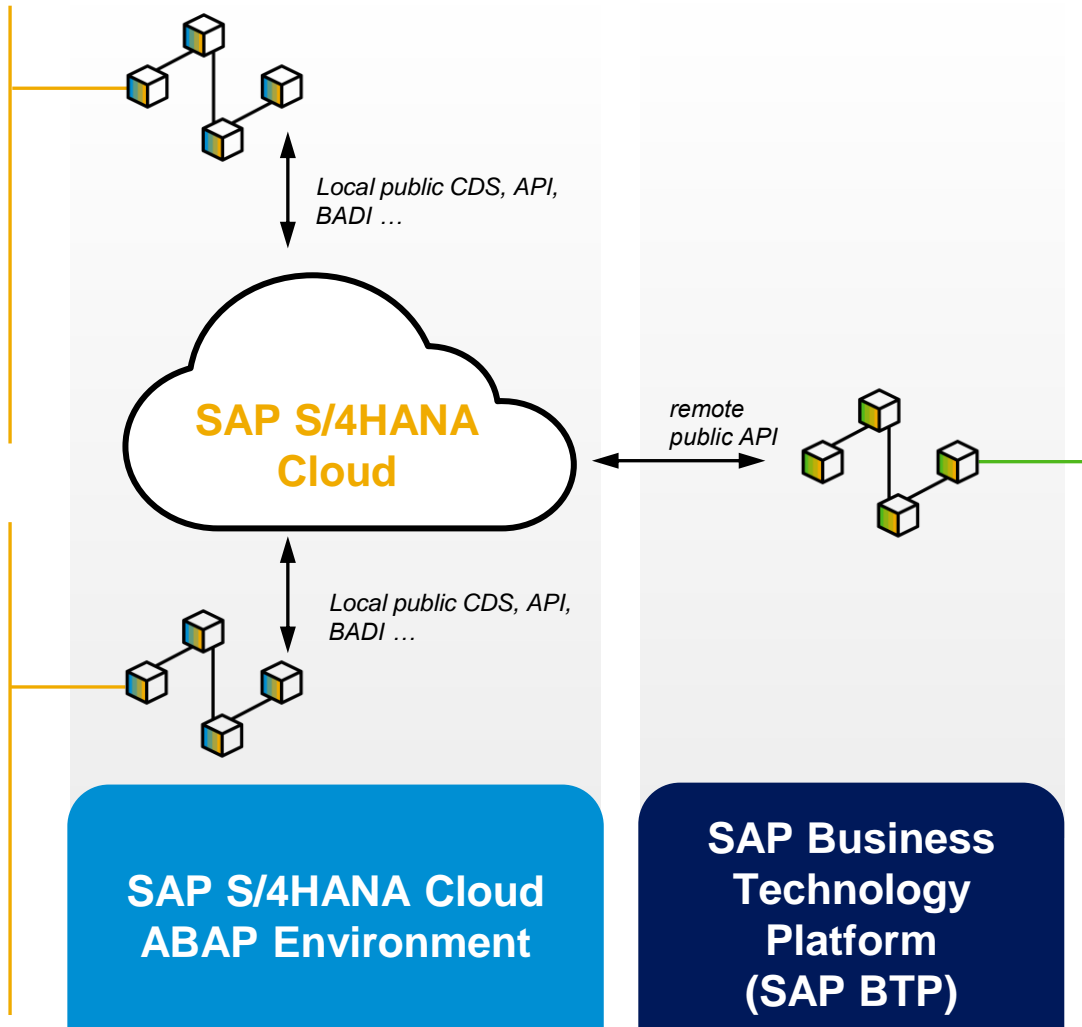
Key User Extensibility

Low-Code / No-Code Tools

- UI field layout, custom forms and templates
- Custom analytics via CDS views
- Custom Business Objects
- Custom business logic using Cloud BADIs

Developer Extensibility

- Develop custom ABAP code
- Extensions of SAP S/4HANA Cloud solutions
- Partner extensions
- Directly on SAP S/4HANA stack



SIDE-BY-SIDE EXTENSIBILITY

Side-by-side Extensibility

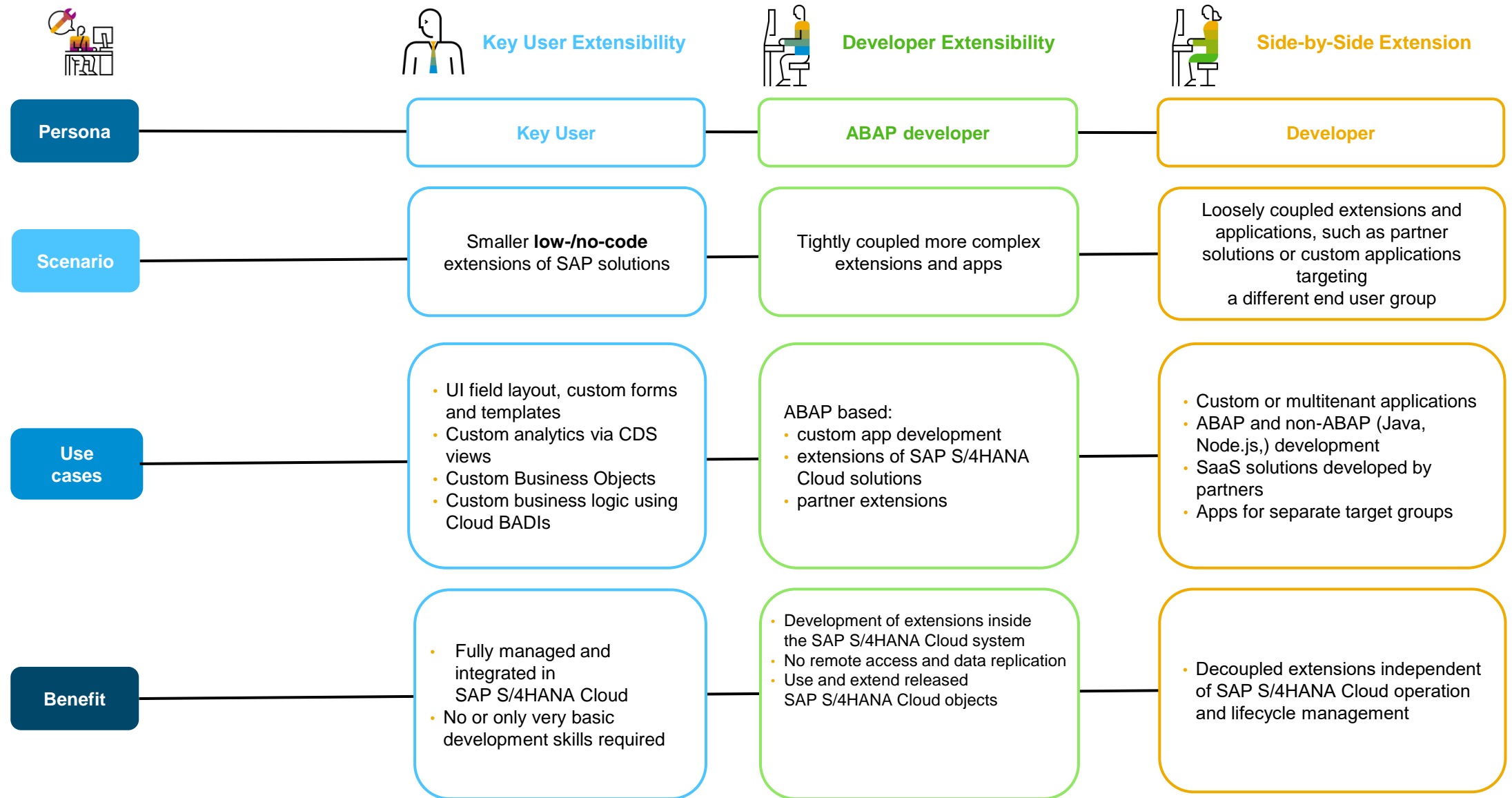
Develop custom code

- Develop extensions and SaaS solutions in ABAP, Java, ,Node.js, etc.

Integration with SAP BTP services

- AI business services
- Process automation
- Data marts and analytics
- Data science and intelligence
- IoT and big data

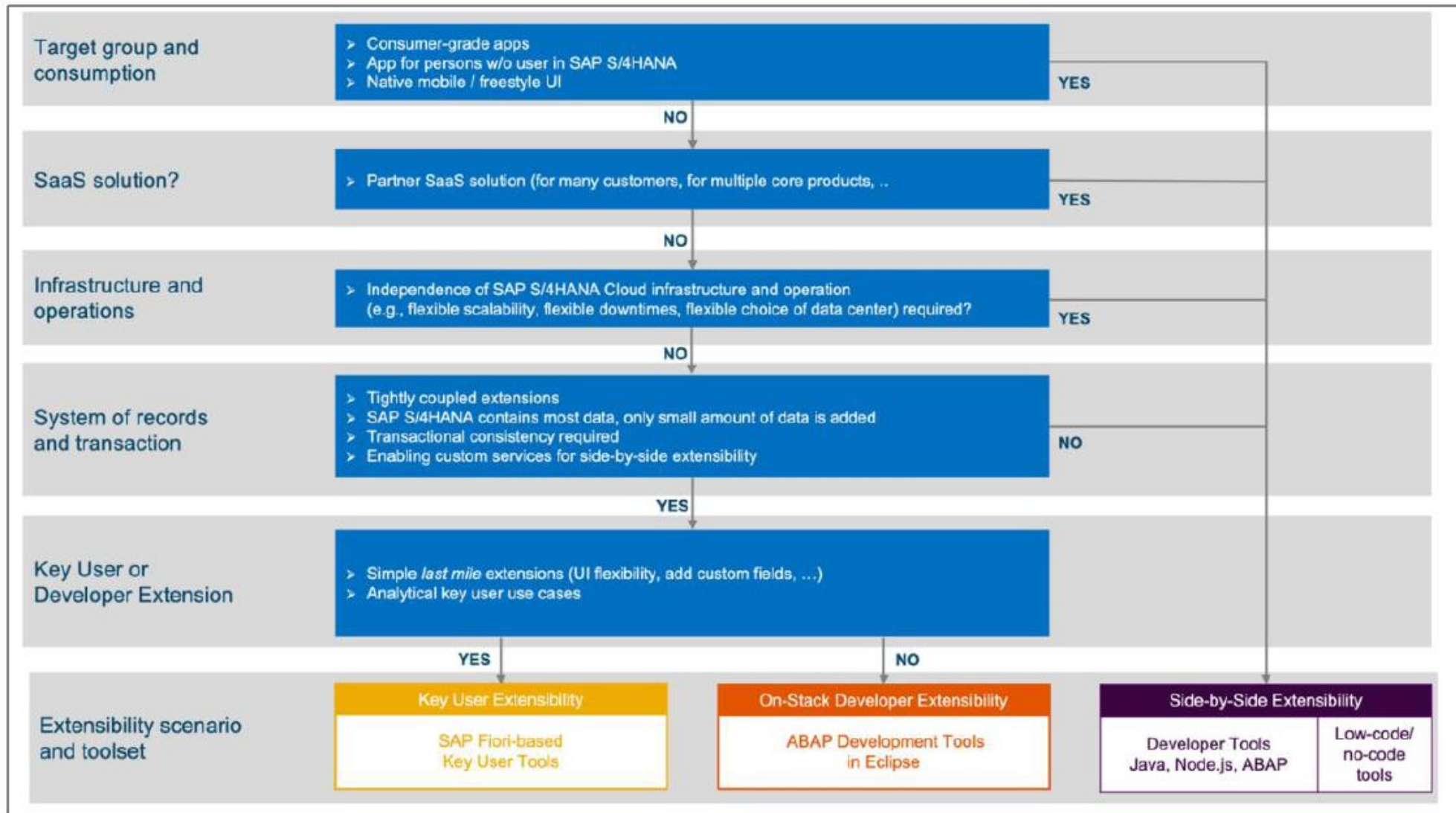
End-2-End Extensibility in SAP S/4HANA Cloud



EXTENSIBILITY INTEGRATED IN SAP S/4HANA CLOUD

SIDE-BY-SIDE EXTENSIBILITY

Decision Tree to select the Right Extensibility Option



Local APIs

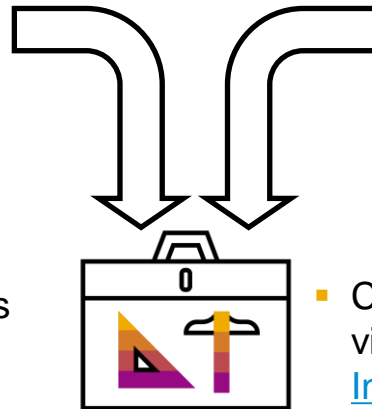


- Success of all **Extension Projects** depends on a rich set of local APIs

Upcoming New APIs



- SAP continuously delivers new local APIs with high priority

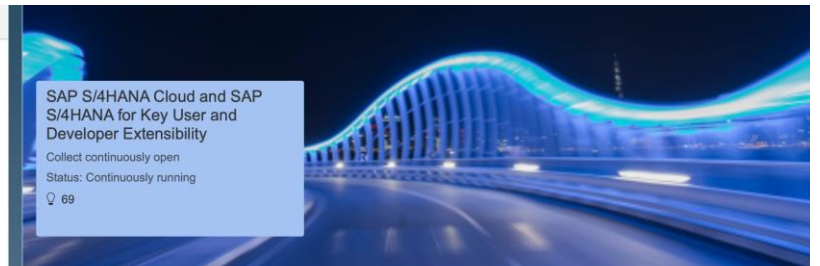


**Additional
Local APIs**



- Customers can request APIs via dedicated [Customer Influence Session](#)
- Shipment of API via Continuous Feature Delivery (CFD) or with next Release

Overview	
🔍 All Requests	69
🔍 Requests Open for Voting	29
🔍 My Requests	0
💬 My Comments	2
❤️ My Votes	0
📅 Blogs	1
🔍 Delivered Improvements	18
Submit Improvement	
You are Following	
Contact us	



Welcome to this feedback session for SAP S/4HANA Cloud and SAP S/4HANA for Key-User and Developer Extensibility

We will accept requests for new APIs, enhancements on existing APIs for the SAP S/4HANA Cloud and SAP S/4HANA product family.

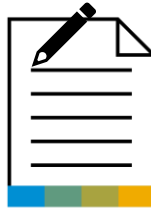
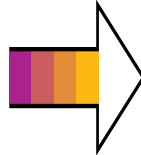
The focus of this session is to give our customers and partners a central entry point to request On-stack APIs from type "released for cloud development" to be consumed in [Key-User](#) and [Developer Extensibility](#).

Guidance – Working with Local APIs



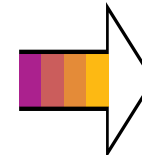
Existing Code

Investigate what needs to be refactored



New development

*you know what you need
and look for what has
changed*



No API available

*You can't find what you are
looking for which needs to
be there*

Custom Code Check for SAP S/4HANA Cloud via ATC

(see Note [2923223](#))

- Identifies objects not released for Cloud Development (e.g. tables, function modules)
- Identifies object types not available for Cloud Development (Screens, Reports)
- Checks ABAP language Version 5 compatibility

Identify local API for S/4HANA Cloud

(see Note [3088062](#))

- Work with Released Object Tree of ADT
- Identify Object released for Cloud Development
- CDS Views (DDLs), RAP Façade (BDEF), Enhancement Spot (ENHS)
- Find successor Information for not to be released objects (e.g. I_Product for MARA)

Request API released for Cloud Development from SAP

(see Note [3126893](#))

- Use [Customer Influence Session](#) to create innovation request

ABAP Extensibility - Ready for the Cloud

**IN THE PUBLIC CLOUD, SAP SOFTWARE UPDATES RUN AUTOMATED
AND FOR ALL TENANTS IN PARALLEL**

THERE IS NO CUSTOMER SPECIFIC UPGRADE PROJECT

NEW RULES FOR CLOUD EXTENSIONS

ONE

Extensions can only use released SAP APIs. SAP keeps these APIs stable.

TWO

SAP objects can only be extended via predefined extension points. NO free style modifications are allowed.

THREE

Key users and extension developers use only cloud-enabled and released technologies. The activities of developers and key users are regulated via access permissions

What's in **for** partners?



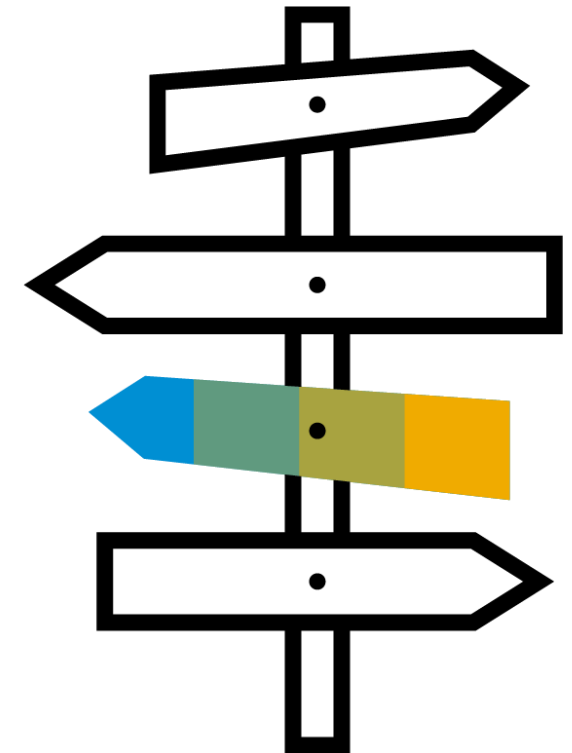
What's in **for partners?**

Why a **new extensibility** option?

- ABAP has been available for years and is one of the foundational element of SAP success with partners and customers
- First step was to provide an ABAP Platform that is not only the benchmark for enterprise-readiness, as today, but is Cloud-ready as well
- Bring this new ABAP platform into S/4HANA Cloud

Why we believe it's **relevant for you** as partner?

- You can leverage your existing ABAP expertise and evolve this to the Cloud
- You can create custom Business Objects in the system (with higher flexibility)
- You can expose the custom business objects and logic externally (e.g. for consumption with SAP BTP)



Thank you.

Dev4S4 | S/4HANA Cloud, ABAP Environment Bootcamp for Developers | Partner Hands-on workshop



WorkZone : [Dev4S4 | Partner hands-on workshop](#)

Game Time

