

# Extensibility with S/4HANA and ABAP Cloud

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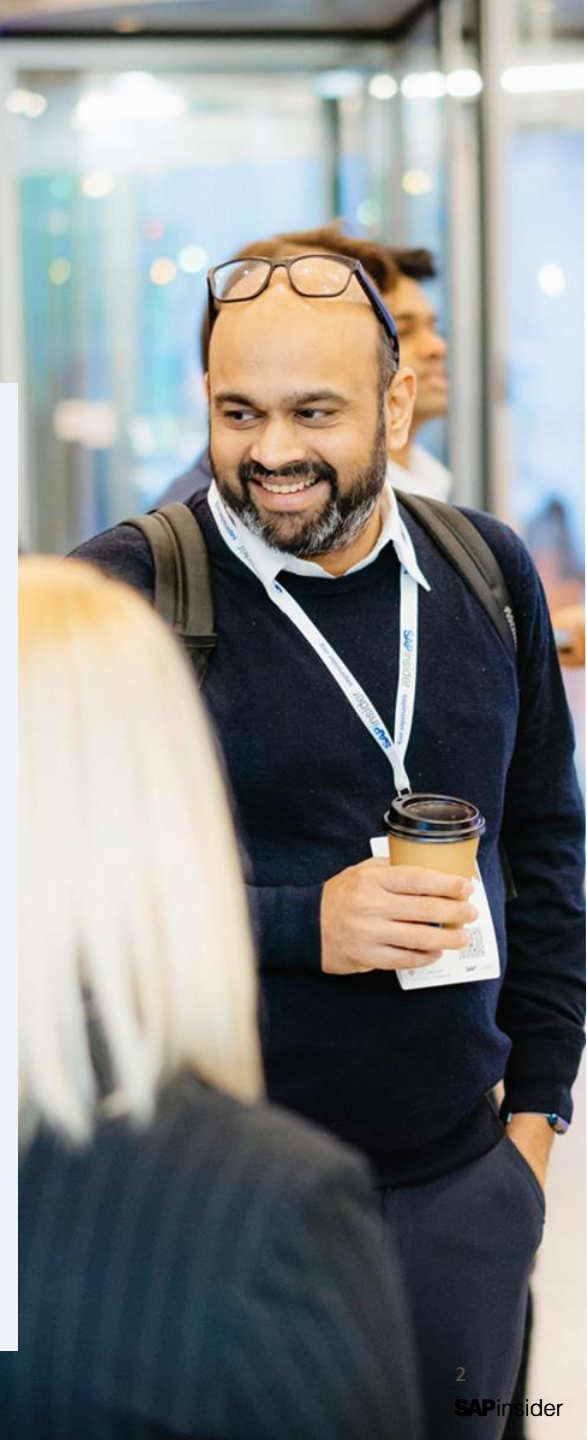
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# What We'll Cover

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- Modern Extensibility Options Overview
- ABAP Platform Overview
- ABAP Development Tools
- Custom code adaptation for SAP S/4HANA and ABAP Cloud





# Modern Extensibility Options with S/4HANA

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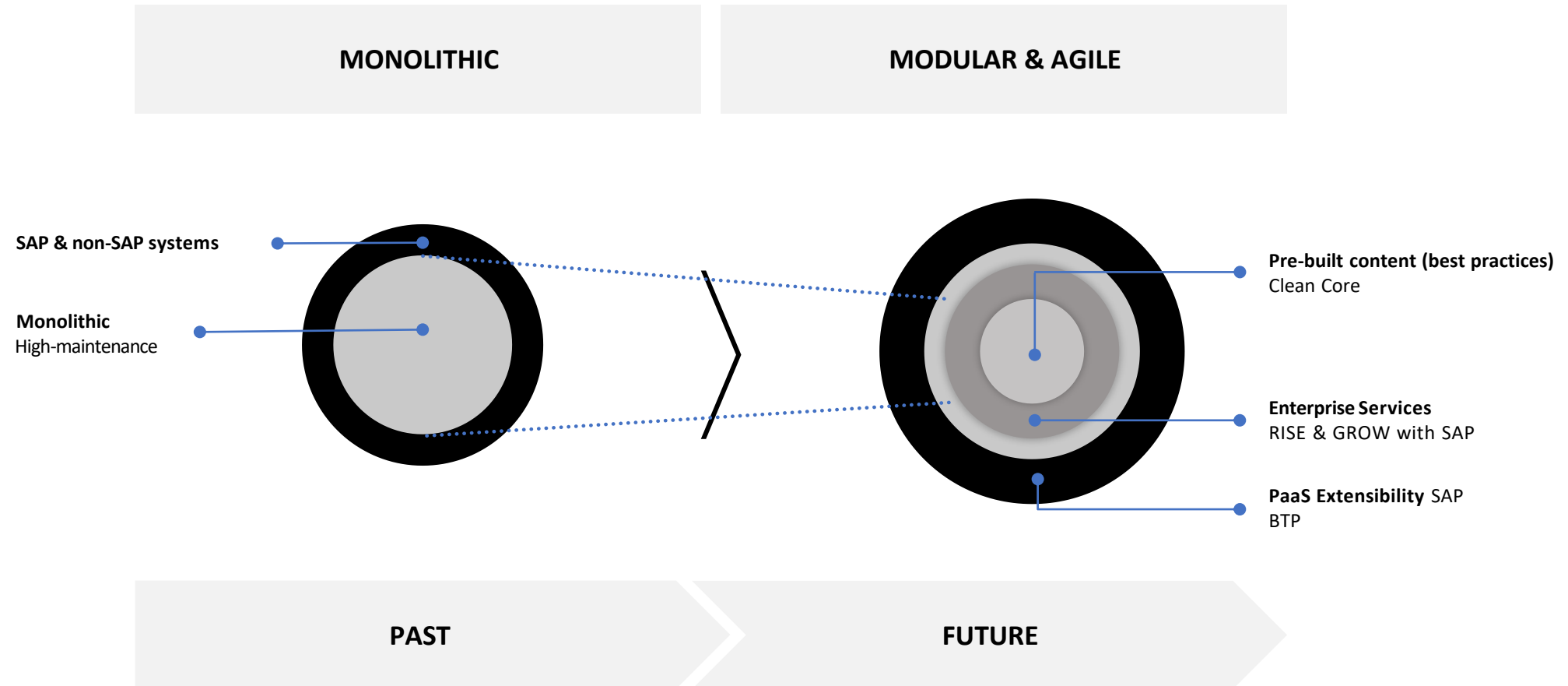
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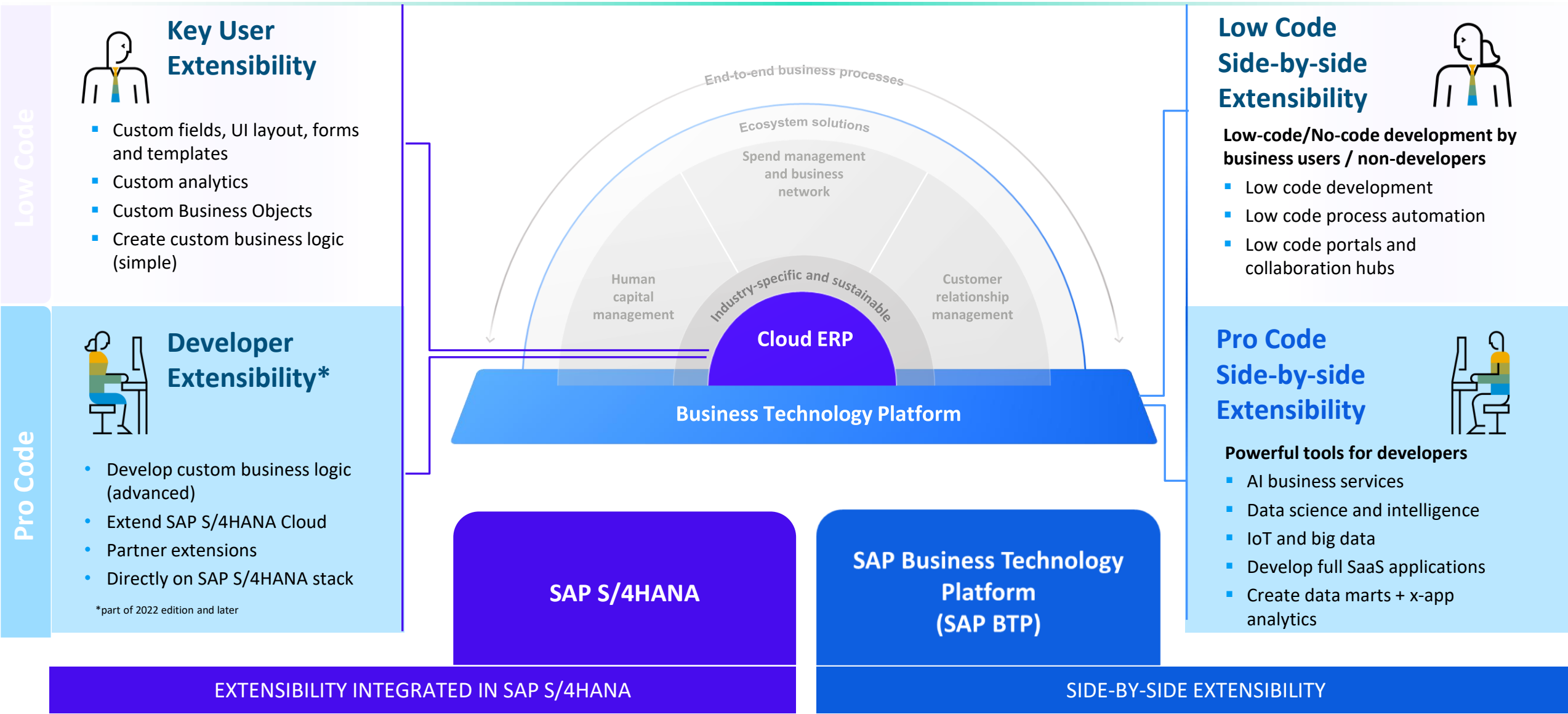
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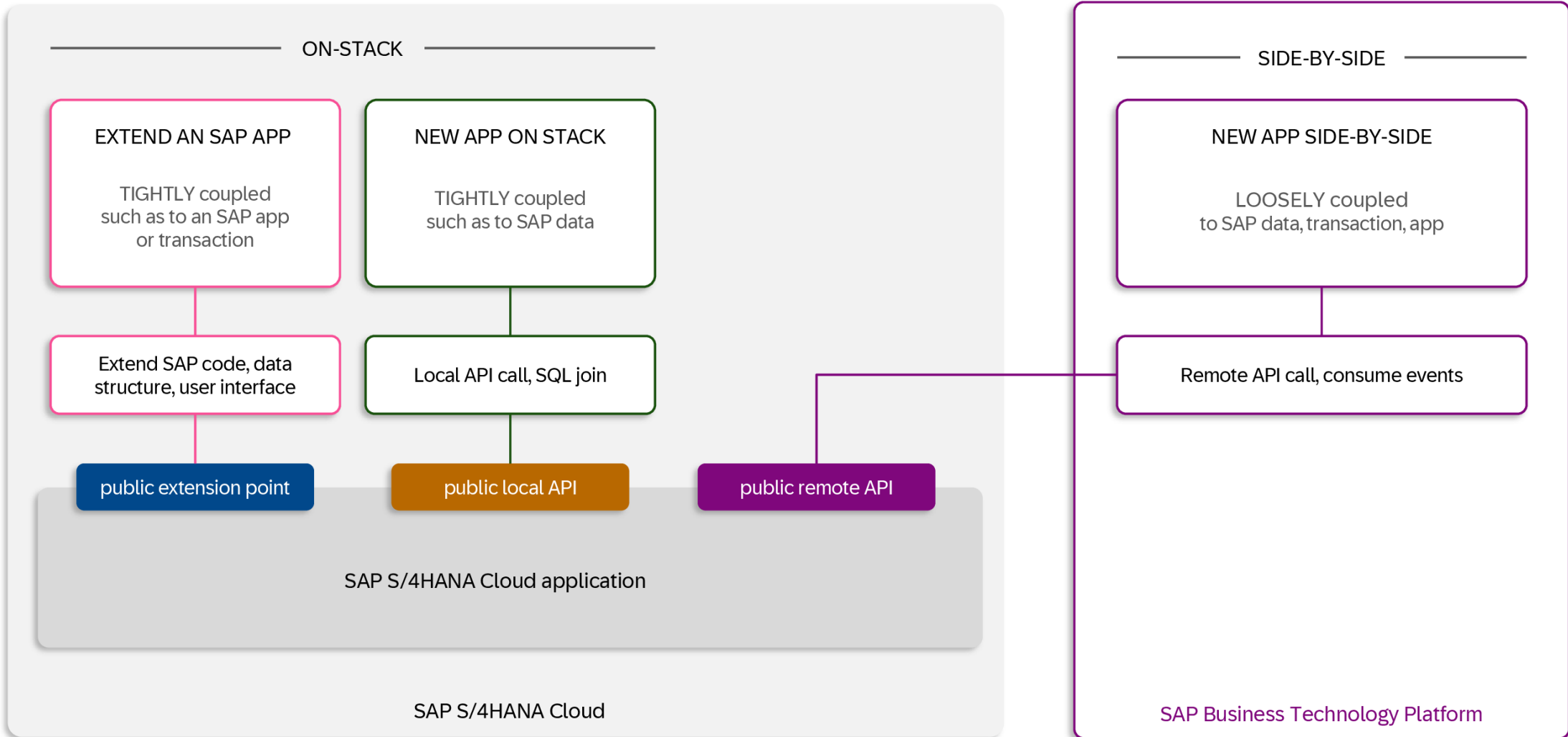
# Modern Extensibility Options to Keep the Core Clean



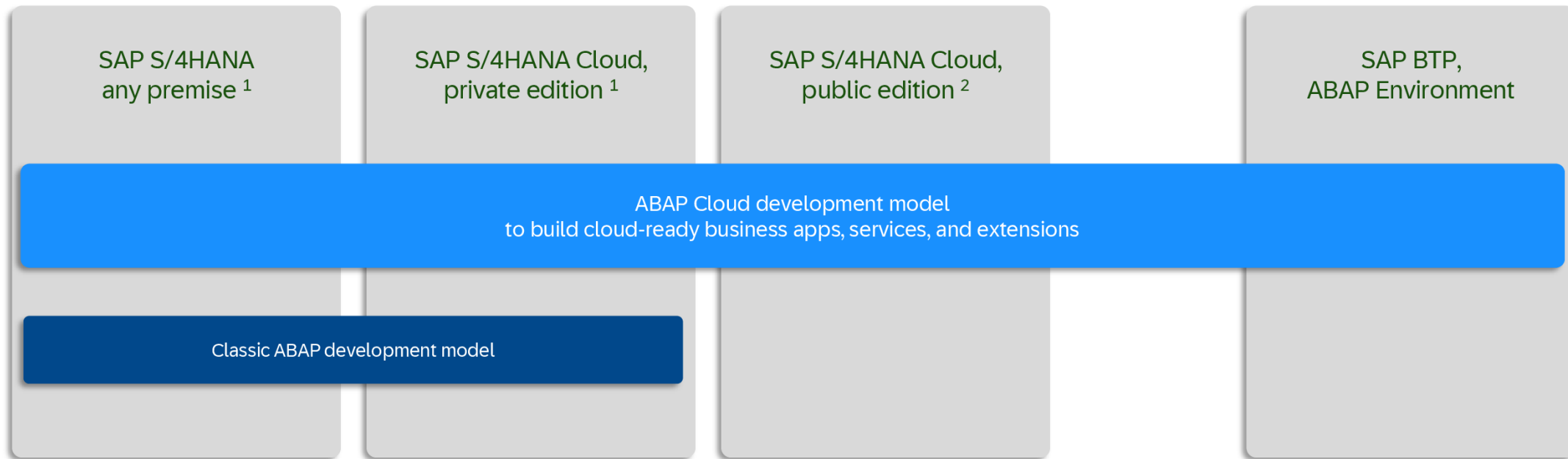
# Stay Agile, Stay Modular, Stay Flexible with Modern Extensibility Options.



# SAP S/4HANA Cloud extensibility patterns



# ABAP Cloud – One development model for SAP S/4HANA and SAP BTP



<sup>1</sup> SAP S/4HANA any premise or SAP S/4HANA Cloud, private edition release ≥ 2022

<sup>2</sup> SAP S/4HANA Cloud, public edition release ≥ 2208, 3-system landscape required



# ABAP Platform Overview

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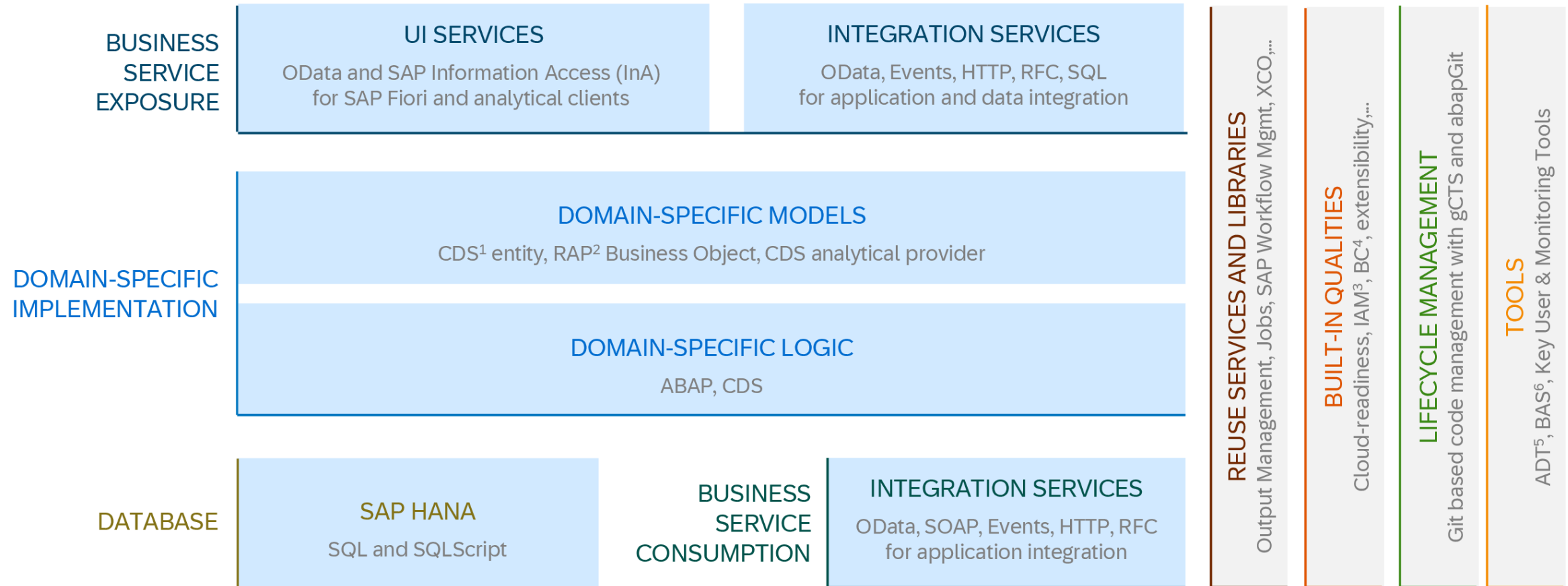
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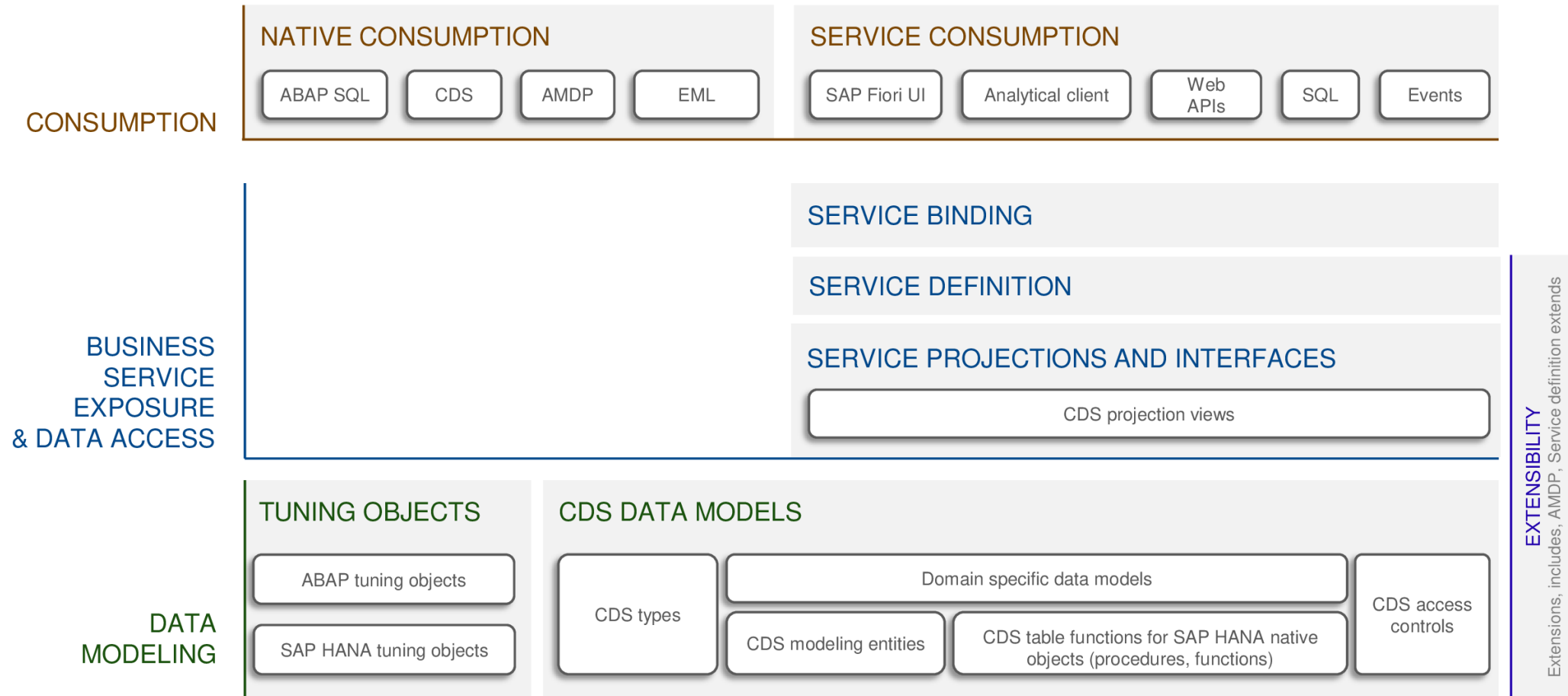
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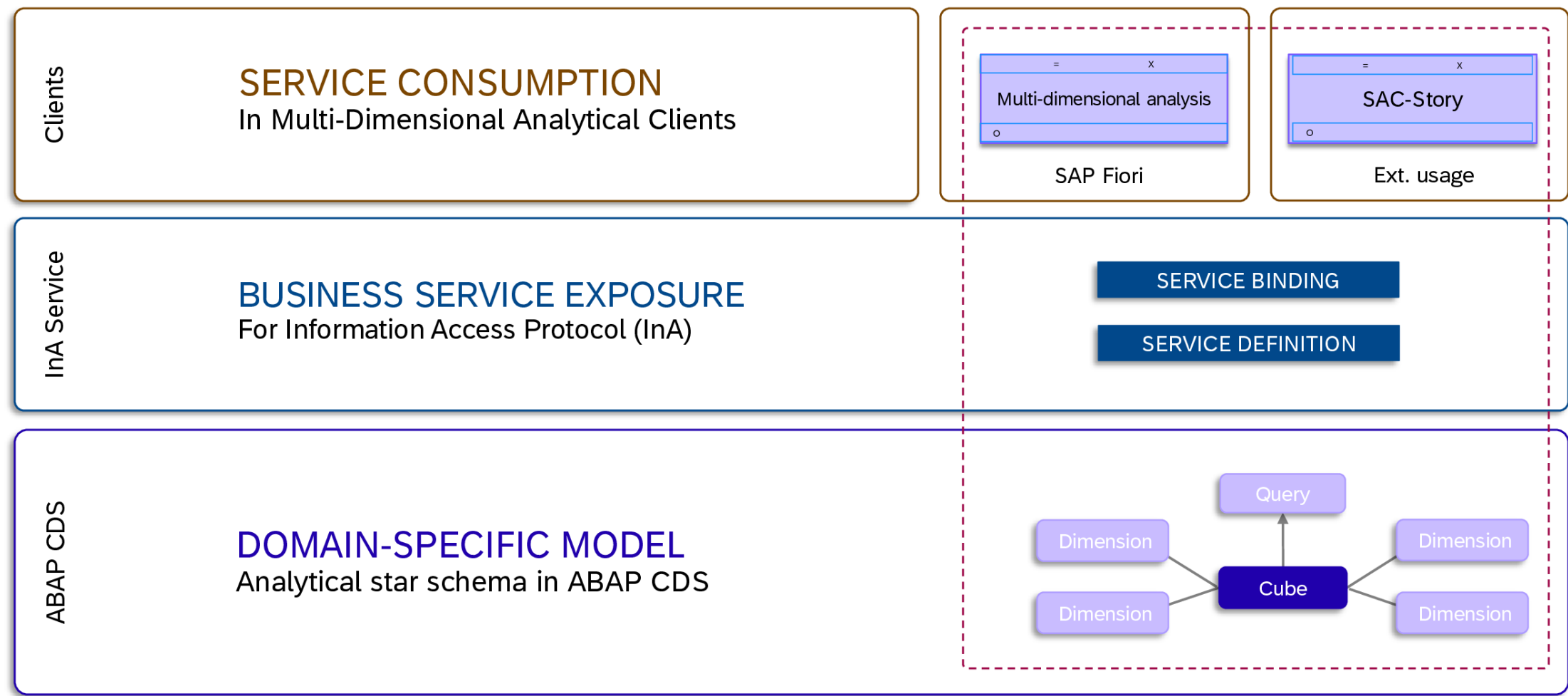
# ABAP Cloud – High-level abstraction model



# ABAP CDS data models

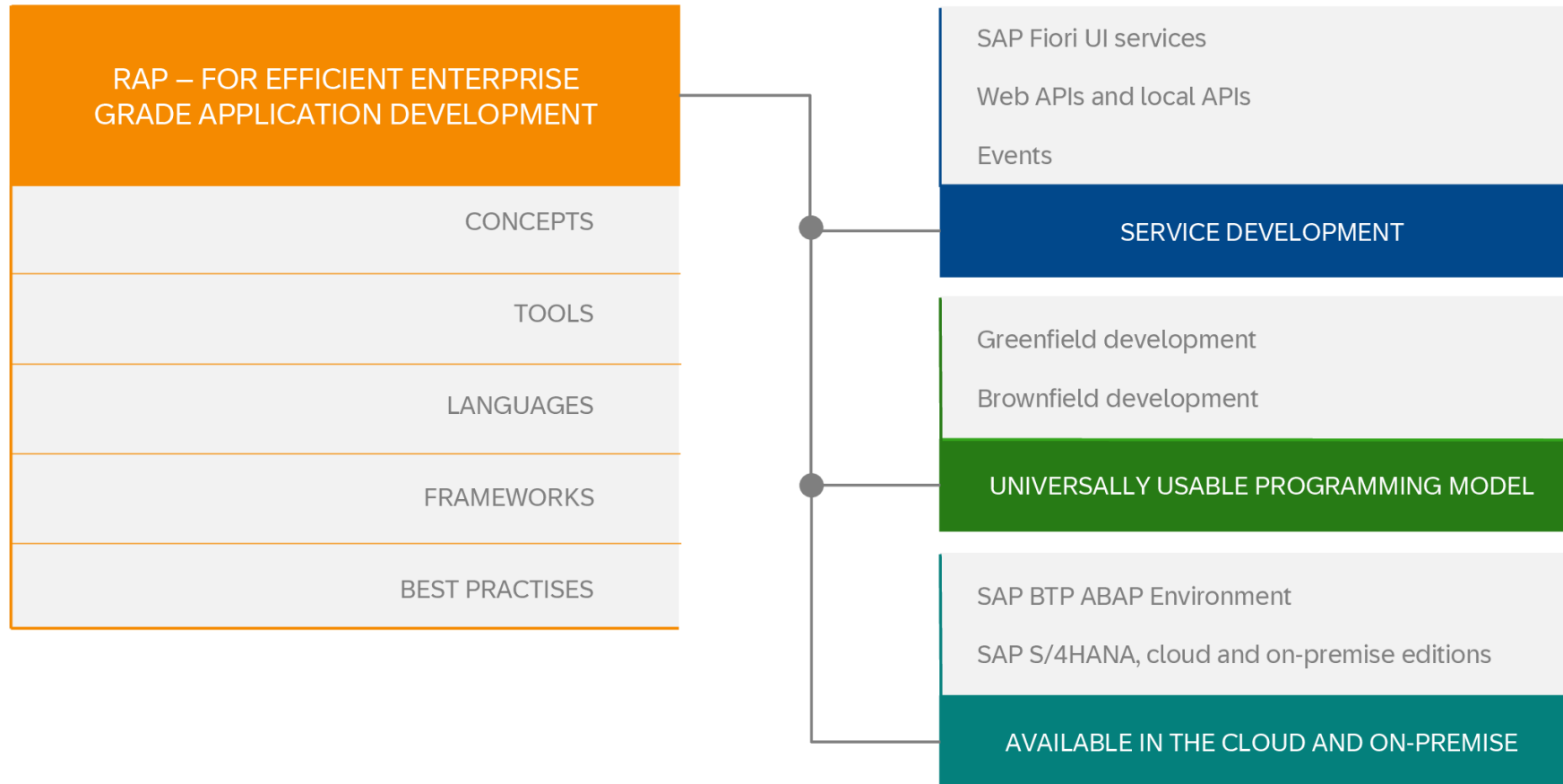


# Standard development flow



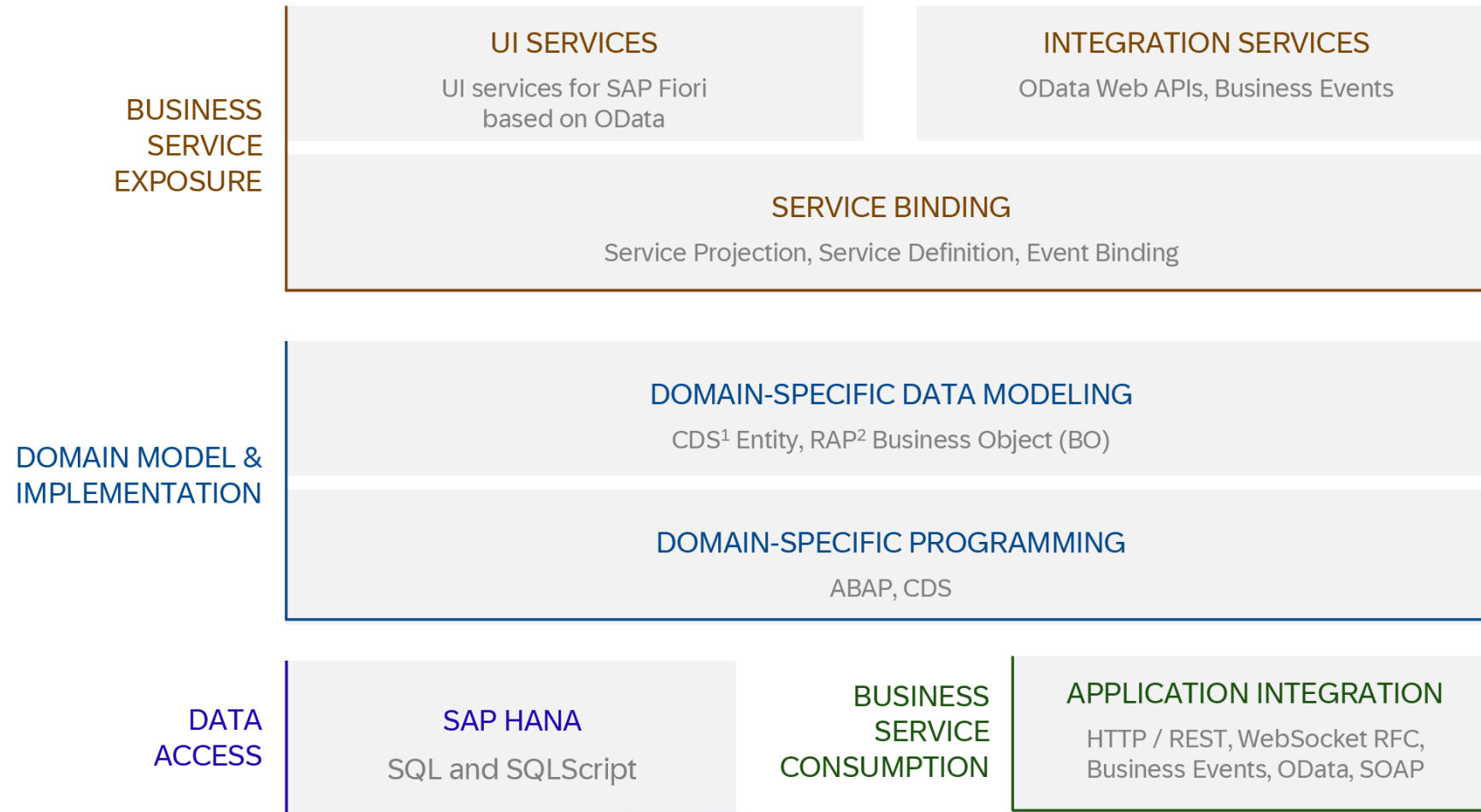
# ABAP RESTful Application Programming Model (RAP)

At the heart of ABAP Cloud for transactional scenarios





# ABAP RESTful Application Programming Model (RAP) – The big picture



# Enterprise event enablement

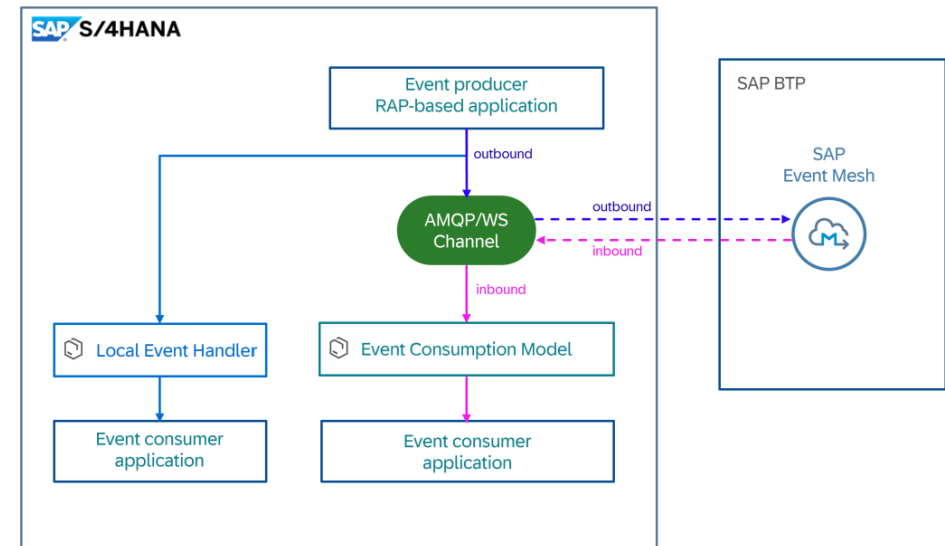
Event-driven architecture natively supported thru enablement of business event exchange between SAP S/4HANA and SAP Event Mesh on SAP BTP

Native exposure and consumption of business events on the ABAP platform

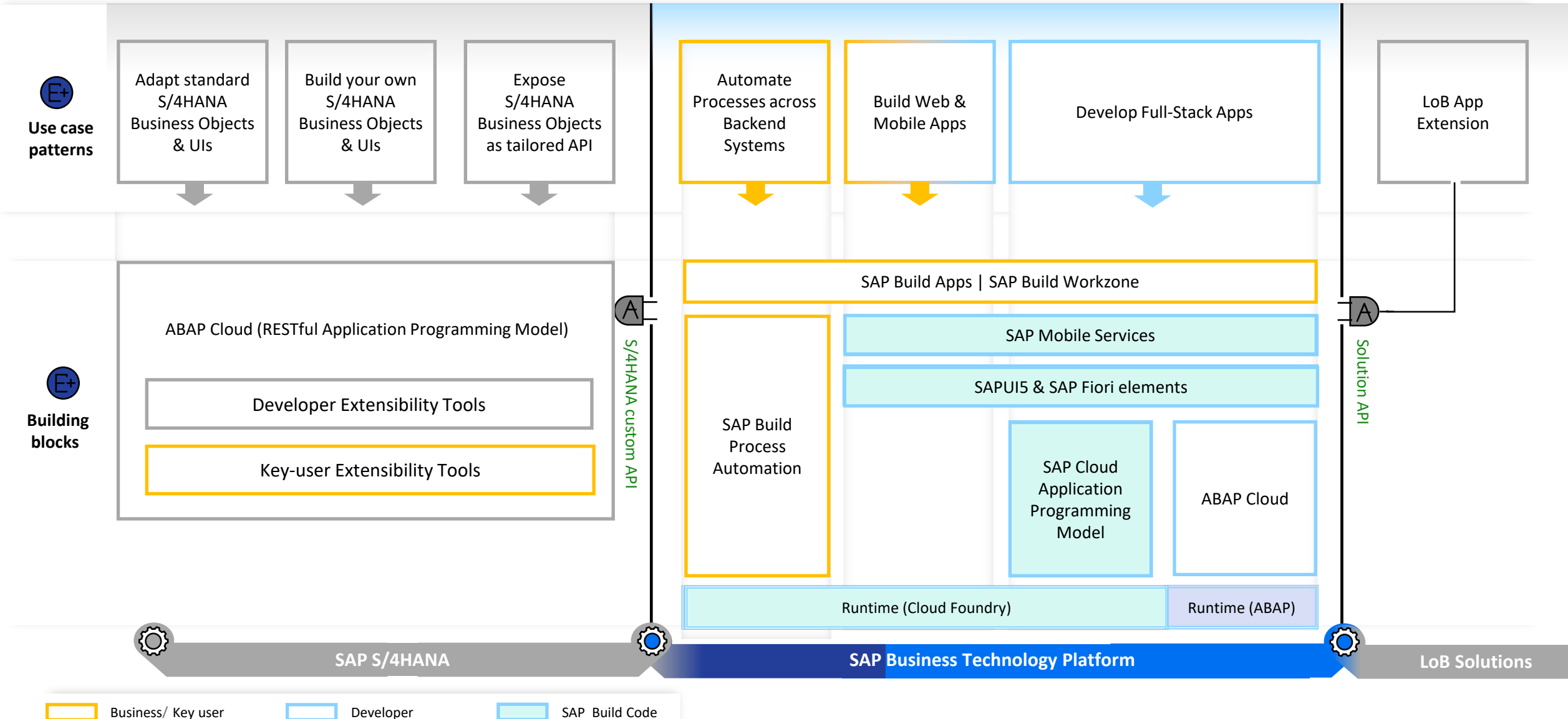
Event Consumption Model is used to enable the event consumption between SAP S/4HANA and SAP Event Mesh on SAP BTP ([more...](#))

Developers can easily define and raise business events in RAP business objects in SAP S/4HANA ([more...](#))

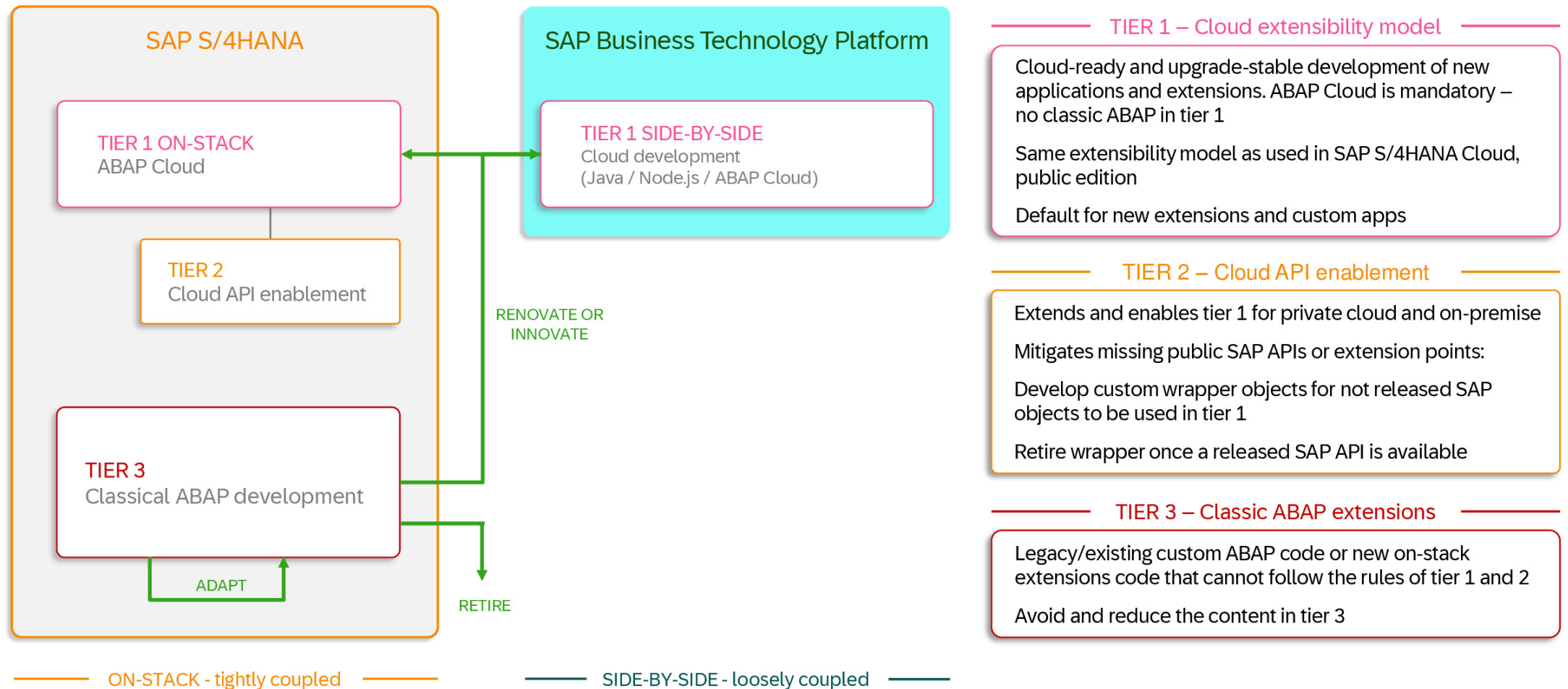
Local consumption: consume events in the same system as they are raised (with Local Event Handler) ([more...](#))



# S/4HANA Extensibility system with BTP

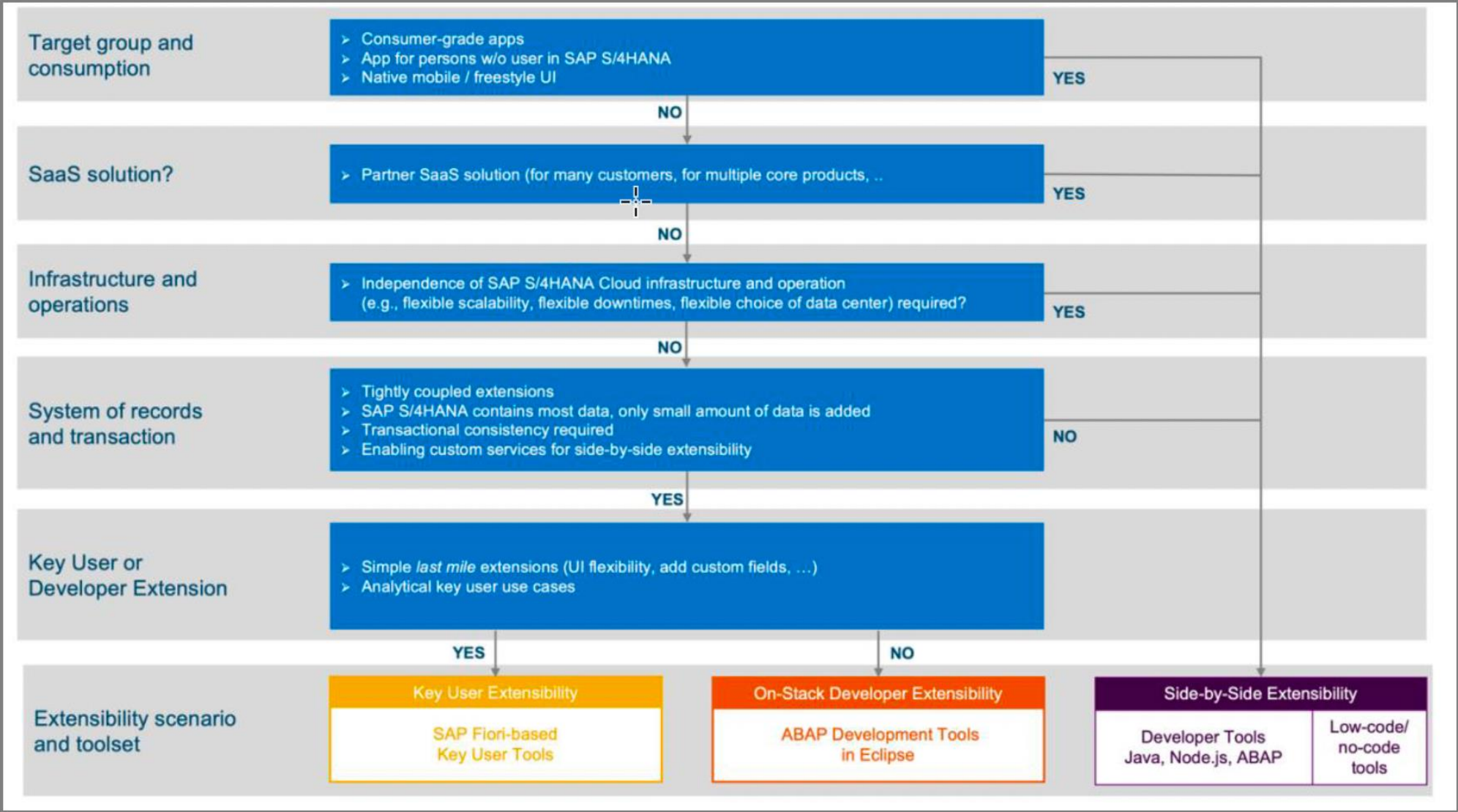


# 3-tier extensibility model for SAP S/4HANA private cloud and on-premise





# Decision Tree



# ABAP Development Tools

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# Efficient ABAP development in Eclipse

## MODERN DEVELOPMENT TOOLSET

Fully eclipse-based  
Syntax check, code completion  
Navigation, search, quick fixes  
Full support for the ABAP RESTful  
Application Programming Model and CDS

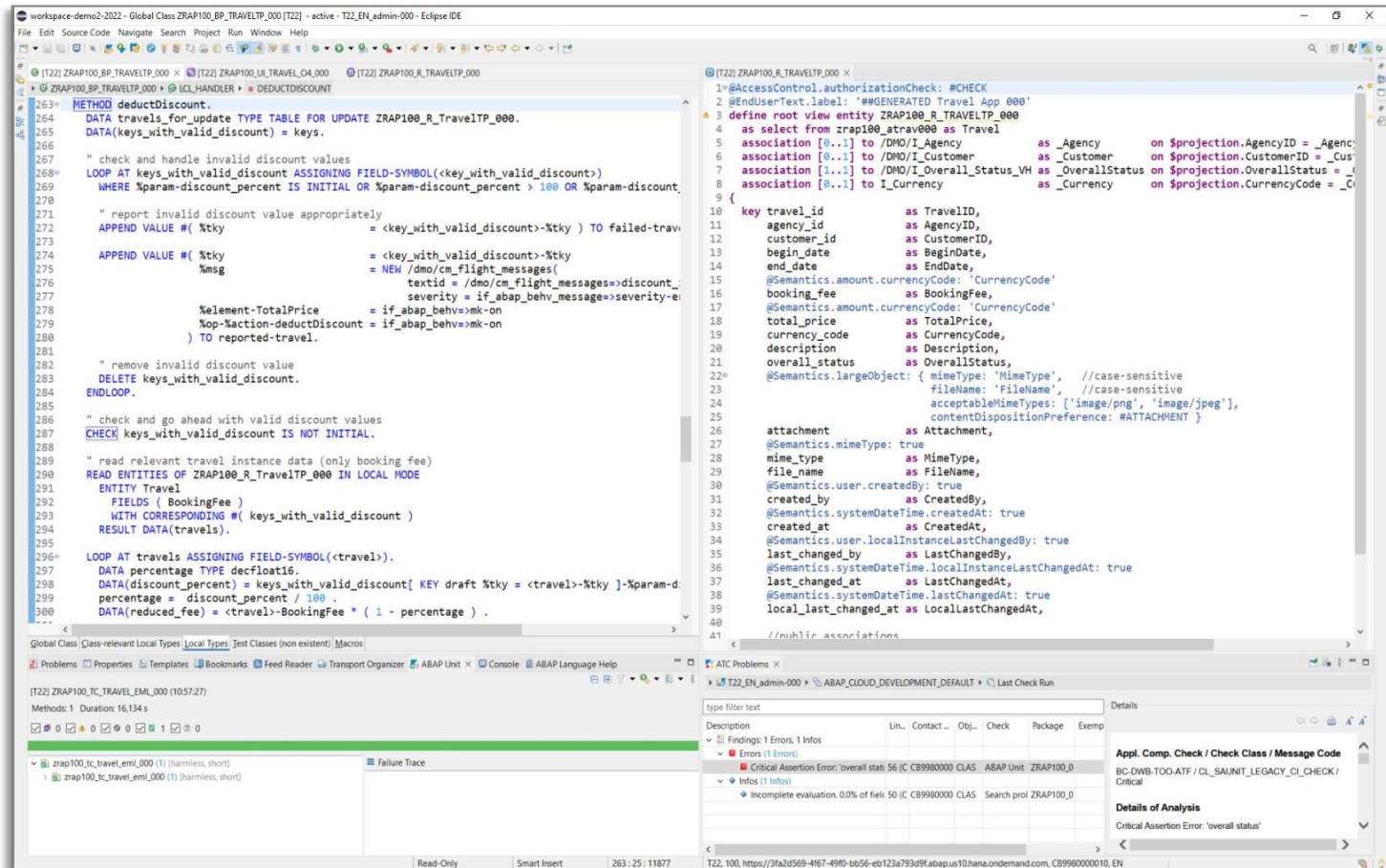
## QUALITY ASSURANCE

Static code checks (ATC, CVA) with  
remote and local scenarios  
Unit testing incl. isolation frameworks  
Test seams and injections

## SUPPORTABILITY

Debugging, profiling, tracing  
Static and dynamic logging  
Runtime monitoring and analysis

## HIGH DEVELOPER PRODUCTIVITY ON-PREMISE AND IN THE CLOUD



# Modern ABAP development in Eclipse – ABAP Platform 2023 feature scope

## DEVELOPMENT

Enhancements for RAP, ABAP CDS and SAP HANA

New Object Set Playground View

Reworking the ABAP Object Search (Ctrl + H)

New Table Index editor and Extension Index editor: to create and edit database table indexes and extension indexes

Data Preview: view specific columns and set filters to restrict the entries, editor: copy contents of columns and cells

ABAP Formatter: format VALUE statements

New Custom Fields display editor (Key User extensibility)

Compare two different objects of the same type in the Project Explorer (in the same project or across different projects)

Improvements in Element Information: display appends for tables and structures, display primary and secondary keys for internal tables and RAP types

## TRANSPORTS

Transport Organizer View Configure tree hierarchy

View Action Logs in the transport **Request** editor or from the **Transport Organizer** View

Transport Editor: group the ABAP objects in the transport by object type

## QUALITY AND TROUBLESHOOTING

abapGit support of ABAP test cockpit objects

New ABAP Memory (Debugger) View to display memory consumption of a debugged ABAP program

Analysis of ABAP dumps is now only possible if a user is assigned the authorization object S\_ABAPDUMP



# ADT Highlights

## abapGit SUPPORT OF ABAP TEST COCKPIT OBJECTS

- Export and import of ATC check objects, ATC check variants and ATC check categories across on-premise and cloud ABAP systems

Check out: [Export and import ATC objects across on-premise and cloud ABAP systems](#)

## NEW ABAP MEMORY (DEBUGGER) VIEW

- Investigate changes in the memory consumption of your ABAP application while debugging it

Current debugger position

ABAP Memory view

Display of the respective memory consumption in accordance to the current debugger position

Memory Area	Used (Bytes)	Allocated (Bytes)	Peak of Used (Bytes)
ABAP Session	7,413,832 (+ 7,413,832)	7,609,956 (+ 7,609,956)	7,430,940 (+ 7,430,940)
Total (Internal Sessions: 2)			
Active Internal Session			
Total	1,009,728 (+ 1,009,728)	1,974,720 (+ 1,974,720)	1,626,716 (+ 1,626,716)
ABAP Application			
Total	116,368 (+ 116,368)	136,792 (+ 136,792)	114,948 (+ 114,948)
Static Variables	114,948 (+ 114,948)	114,948 (+ 114,948)	114,948 (+ 114,948)
Stack Variables	0 (+ 0)	18,032 (+ 18,032)	0 (+ 0)
Dynamic Objects	1,520 (+ 1,520)	3,912 (+ 3,912)	0 (+ 0)

More details in SAP Help Documentation [ABAP Memory \(Debugger\) View](#)

# ADT Highlights

## NEW CUSTOM FIELDS EDITOR (KEY USER EXTENSIBILITY)

- ▶ **Custom Fields** editor to display custom fields which have been created with the **Custom Fields and Logic** app

The screenshot shows the 'Custom Field: Z\_CF\_DEMO' editor. It features a 'General Information' section with fields for 'External Name' (Z\_CF\_DEMO) and 'Type' (Text). Below this is a 'Type Details' section with a list of properties on the left and input fields on the right. Callouts highlight specific features: 'Display external name and type' points to the top header; 'Filter and select custom field properties' points to the 'Type' dropdown; 'Display details for selected property' points to the 'Type Details' section. The 'Type Details' list includes 'Type filter text', 'Type Details' (highlighted), 'Labels and Tooltips', 'Extended Business Context Details', 'Extended CDS View Details', and 'Extended OData Service Details'. The 'Type Details' section on the right includes fields for 'Length' (20), 'Scale' (0), 'Aggregation' (None), 'Associated Business Object', 'Value Help View', and 'Dimension View'.

Custom Field: Z_CF_DEMO	
<b>General Information</b>	
External Name: *	Z_CF_DEMO
Type: *	Text
<b>General Information</b>	
type filter text	
Type Details	
Labels and Tooltips	
Extended Business Context Details	
Extended CDS View Details	
Extended OData Service Details	
<b>Type Details</b>	
Length:	20
Scale:	0
Aggregation:	None
Associated Business Object:	
Value Help View:	
Dimension View:	

# ABAP Custom Code Adaptation Tools

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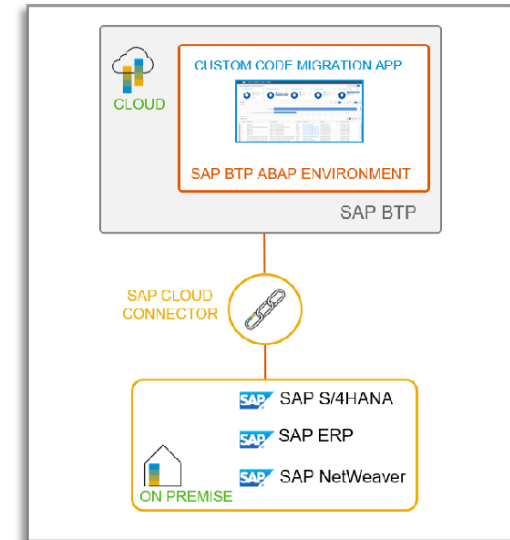
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# Custom code analysis with Custom Code Migration app

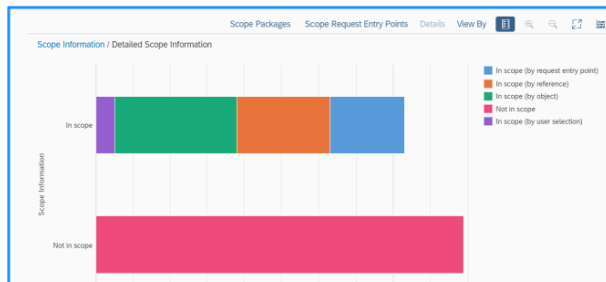
## SOLUTION OVERVIEW

- Available in an SAP S/4HANA >=1809 system or in SAP BTP ABAP Environment
- Technically based on [remote ABAP test cockpit](#)
- Analysis of custom code for SAP S/4HANA, SAP BTP, ABAP Cloud, classic ATC use cases
- Simplified custom code remediation
- Obsolete custom code removal based on usage data
- Identification of custom code candidates for back-to-standard and redesign
- Evaluation of custom code for semi-automated adaptation (quick fixes in ABAP development tools for Eclipse)

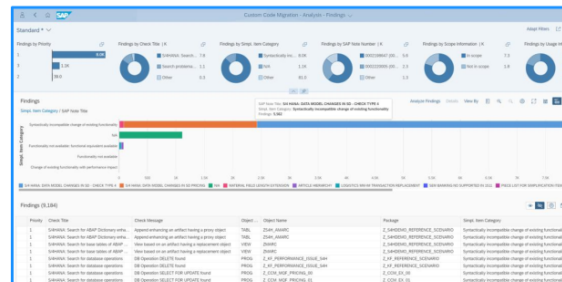


## HIGH LEVEL FEATURES

### SCOPING

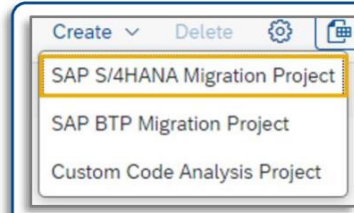


### ANALYSIS



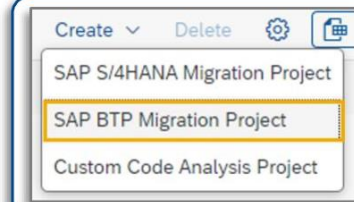


# Custom code analysis use cases with Custom Code Migration app



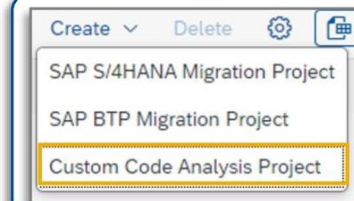
## SAP S/4HANA CONVERSION

- For tightly coupled custom code extensions
- Analysis of custom code for migration to SAP S/4HANA ([link](#))



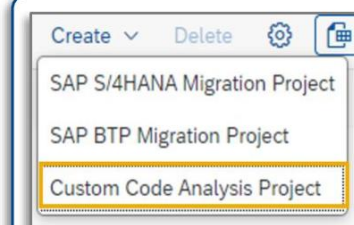
## SAP BTP MIGRATION

- For loosely coupled custom code extensions
- Analysis of custom code for migration to SAP BTP ABAP Environment ([link](#))



## CLOUD ATC

- Custom Code Migration app on SAP BTP for analysis of on-premise systems
- Analysis of code using classic ATC check variants, e.g. security CVA checks ([link](#))



## NEW USE CASE: ABAP CLOUD MIGRATION

- For analysis of custom code for ABAP Cloud in SAP S/4HANA on-premise and SAP S/4HANA Cloud, private edition systems
- Provide recommendations (based on Cloudification Repository) which released APIs and cloud-like SAP successor objects to use

# Using ATC as developer

## ABAP TEST COCKPIT (ATC)

- Tightly integrated in development ( `Run As...` menu)
- Browse all ATC check runs of the system (filter by users) using ATC Result Browser
- For custom code migration to SAP S/4HANA conversion: Simplification Item information (e.g., SAP Notes, Referenced Objects)
- Integrate checks in your on-going development activities, e.g., during transport release

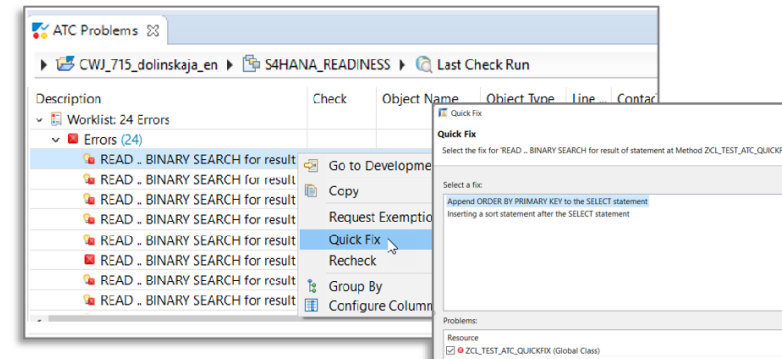
## AUTOMATIC CODE ADAPTATIONS

- Quick Fixes to minimize adaptation efforts
- Examples: No Order-Check

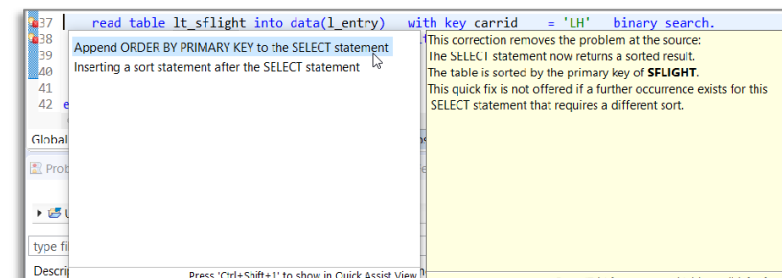
## Run ATC in ABAP Development Tools in Eclipse



## Quick fixes in the ATC problems view



## Quick Fixes in the source code editor



# Wrap Up

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## ABAP Cloud



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

# Key Points to Take Home

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First class development experience in Eclipse using enriched ABAP language and tools fully supporting ABAP Cloud

Enhanced ABAP Core Data Services (CDS) and ABAP SQL for advanced data modelling and access on SAP HANA, and embedded analytics

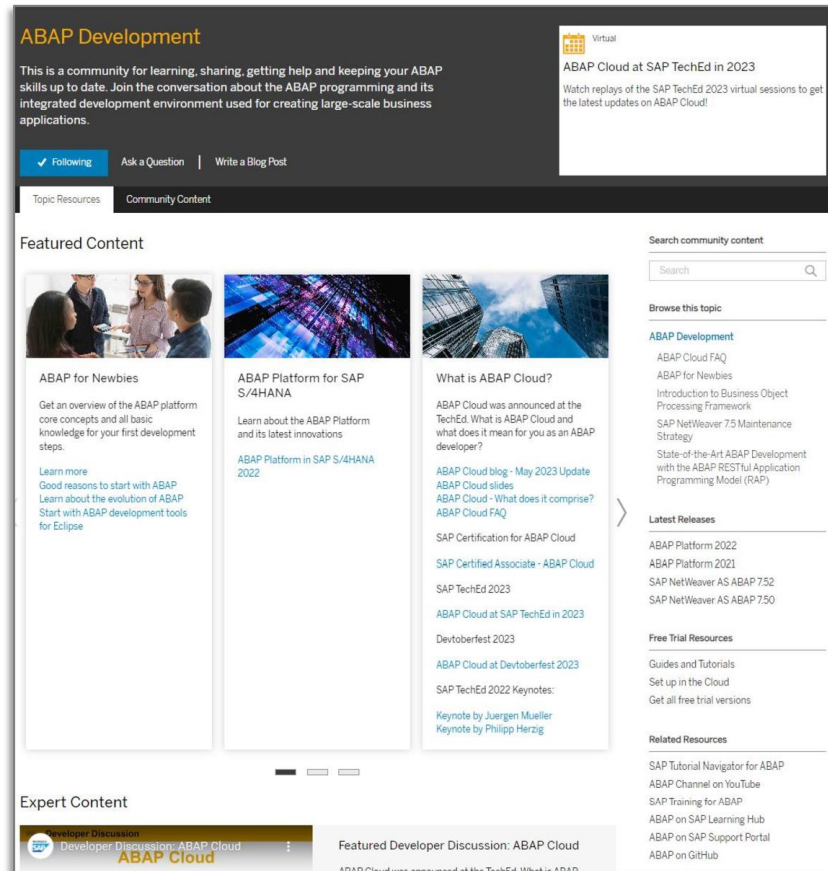
Enhanced feature set of the ABAP RESTful Application Programming Model (RAP) – incl. hierarchical tree views, side effects, extensibility options

Highly proficient ABAP tools for advanced code quality assurance fully supporting adaptation of legacy code to SAP S/4HANA and ABAP Cloud and driving adoption of ABAP Cloud for new developments

Enterprise event enablement of SAP S/4HANA, with local and remote event consumption using SAP Event Mesh on SAP BTP for the latter, real-time events with ABAP Channels and ABAP Daemons, Industrial IoT, and M2M communication, WebSocket RFC, MQTT and AMQP support

One common extensibility model for SAP S/4HANA and SAP BTP based on ABAP Cloud including key user, on-stack developer and side-by-side extensibility options for clean core ready extensions

# Where to Find More Information



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## SAP HELP PORTAL

✚ [What's New in ABAP Platform in SAP S/4HANA 2023](#)

## SAP COMMUNITY

✚ ABAP Development

<https://community.sap.com/topics/abap>

✚ ABAP Testing and Analysis

<https://community.sap.com/topics/abap-testing-and-analysis>

✚ ABAP Connectivity

<https://community.sap.com/topics/abap-connectivity>

✚ ABAP Extensibility

<https://community.sap.com/topics/abap-extensibility>

✚ SAP BTP ABAP Environment

<https://community.sap.com/topics/btp-abap-environment>

✚ SAP S/4HANA Cloud ABAP Environment

<https://community.sap.com/topics/s4hana-cloud-abap-environment>

## RELATED RESOURCES

✚ Tutorials

<https://developers.sap.com/tutorial-navigator.html?search=abap>

# Thank you! Any Questions?

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<https://www.linkedin.com/in/ruhinaazquadari/>

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