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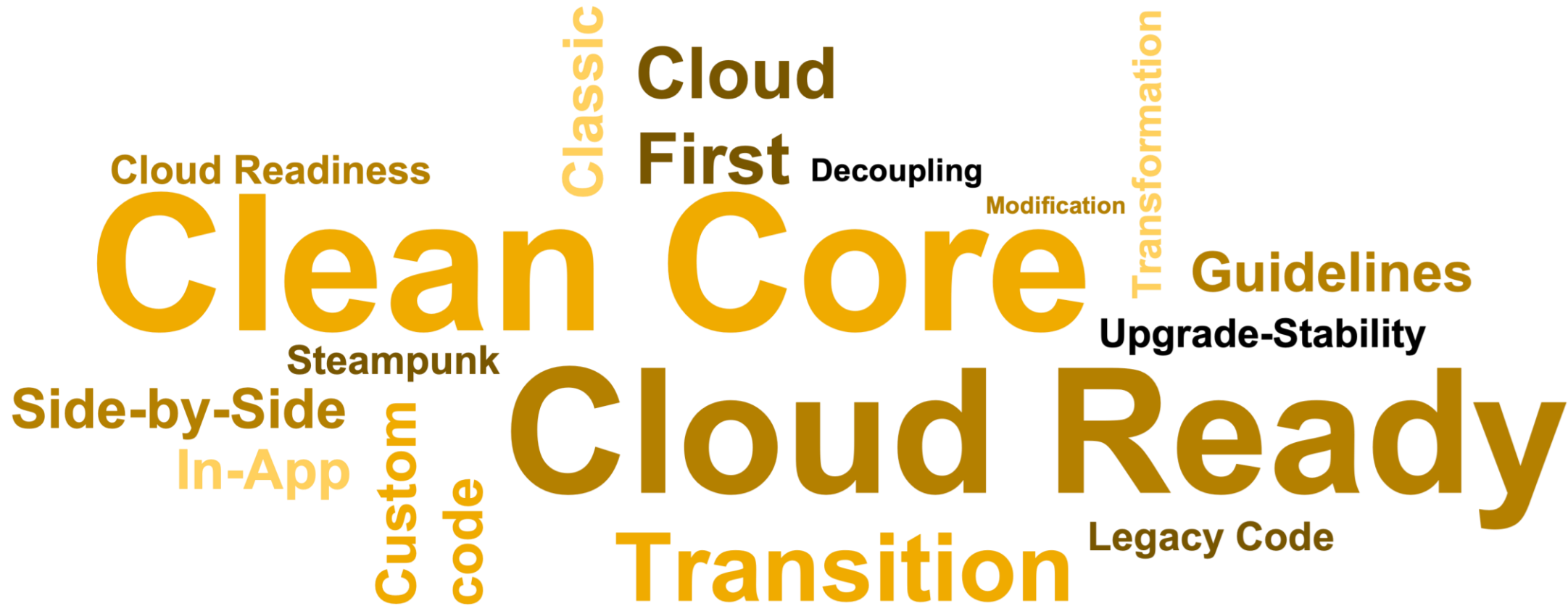# SAP Application Extension Methodology
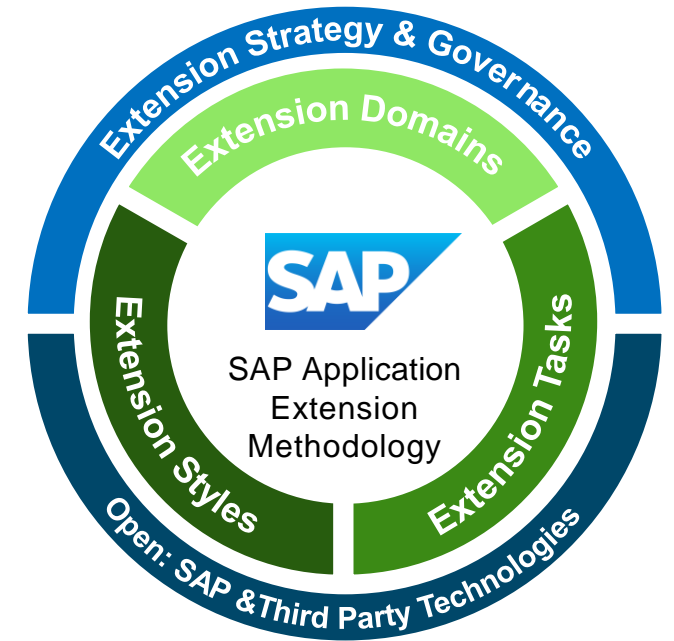
SAP Application Extension Methodology

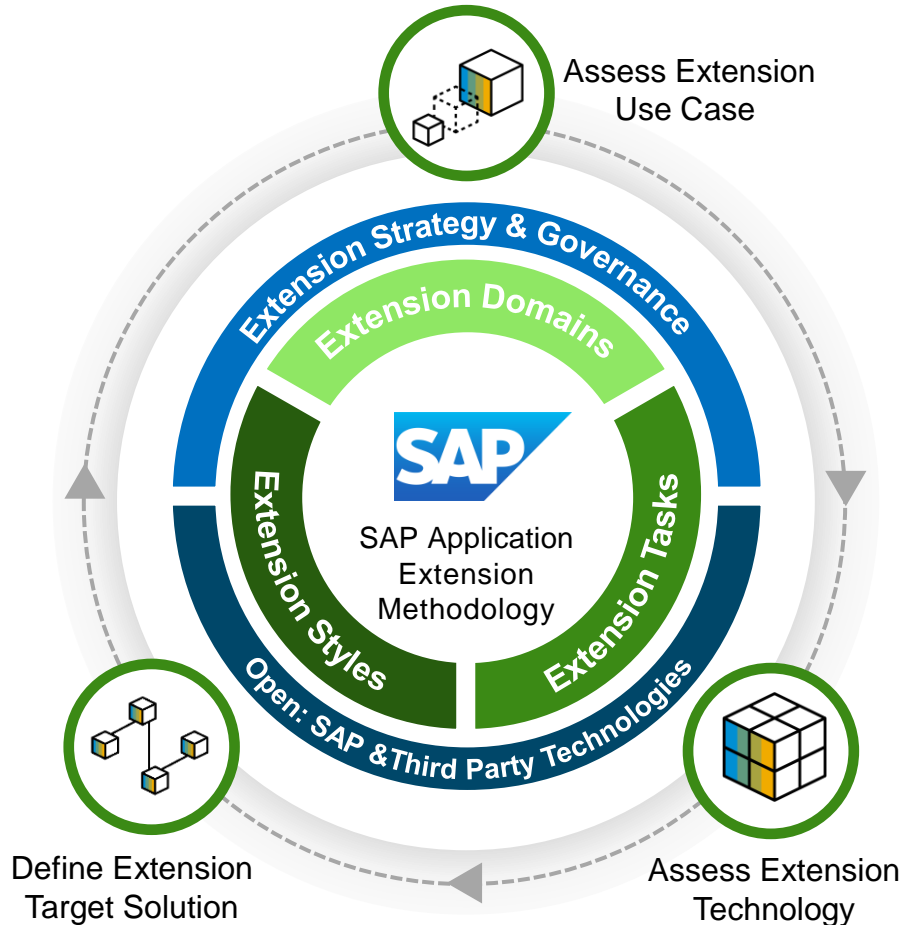| **0**	**1**	**2**	**3**
Overview	Assess Extension Use Case	Assess Extension Technology	Define Extension Target Solution

Customer Challenge

SAP Application Extension Methodology
Goal & Outcome


- Goal:
  - SAP Application Extension Methodology provides a structured, technology agnostic approach for customers and partners to define an organization specific extension strategy, that guides and supports the extension implementation of standard business applications

- Outcome:
  - Enable Enterprise Architects to assess extension use cases and define an extension target solution

SAP Application Extension Methodology

Overview: Phase 1 - 3
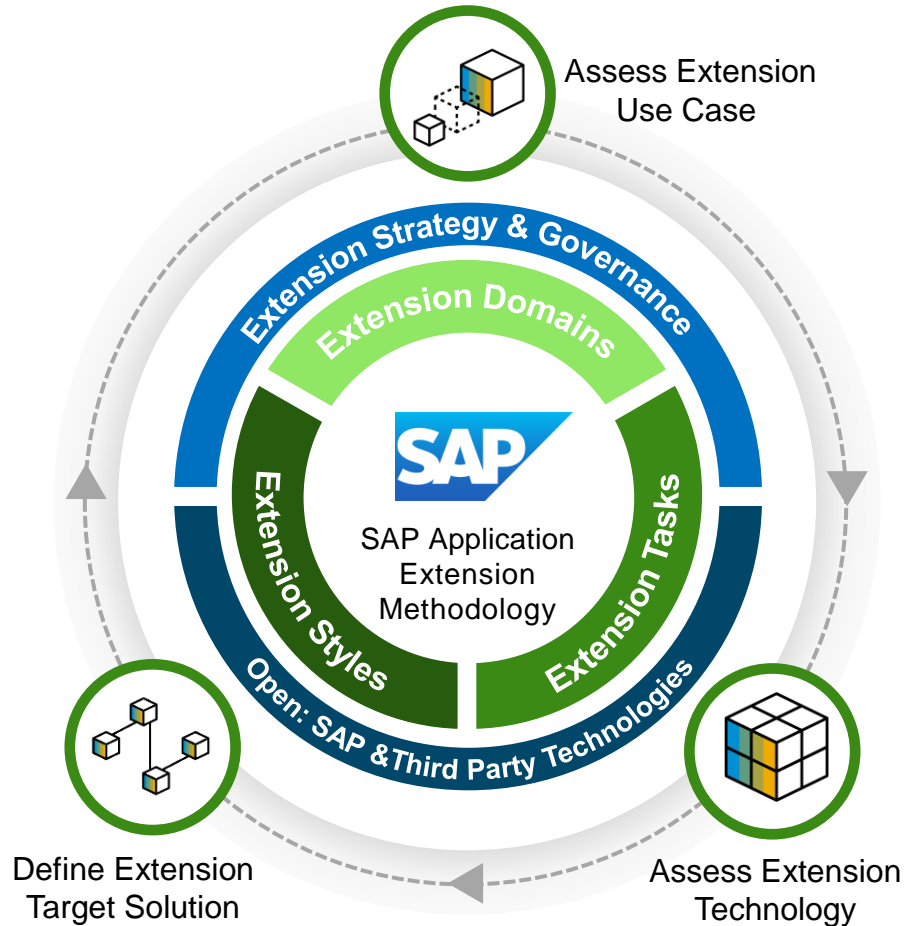
Phase 1: Assess Extension Use Case

System Context → Business Context & Requirement → Extension Application Use Case

Phase 2: Assess Extension Technology

Extension Styles → Extension Task → Extension Technology Mapping

Phase 3: Define Extension Target Solution

Extension Technology per Extension Task → Decision Guidance Assets → Extension Target Solution
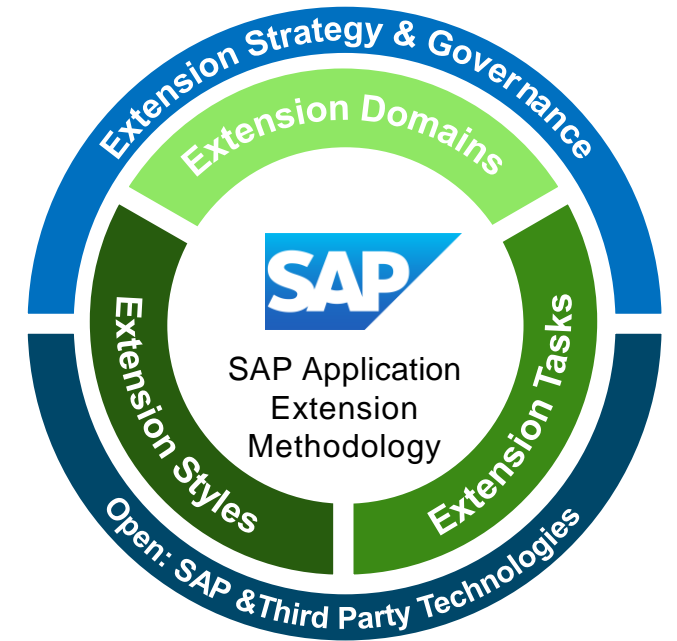
SAP Application Extension Methodology

SAP Application Extension Methodology

- Extension Strategy & Governance
- Extension Domains
- Extension Tasks
- Open: SAP & Third Party Technologies
- Extension Styles

0	1	2	3
Overview	Assess Extension Use Case	Assess Extension Technology	Define Extension Target Solution

Phase 1: Assess Extension Use Case
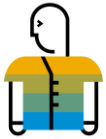
Description:

In this phase you lay the foundation for any extension application use case based on the business context and requirements in a defined area (corporate function, domain, ...) while considering the system context of the respective area.

Goal:

- Understand system context
- Described detailed Extension Application Use Case Description(s)

Involved Persona:

Enterprise Architect   Domain Architect   Business User

Deliverables:

- System Context
- Business Context & Requirement(s)
- Extension Application Use Case Description(s)

System Context — Baseline architecture assessment of relevant systems and components within the extension project scope.

Business Context & Requirement — Brief description of the overall business requirement and its scope for your use case(s).

Extension Application Use Case — Define a to-be scenario solution to solve your business requirement by creating detailed use case description(s).
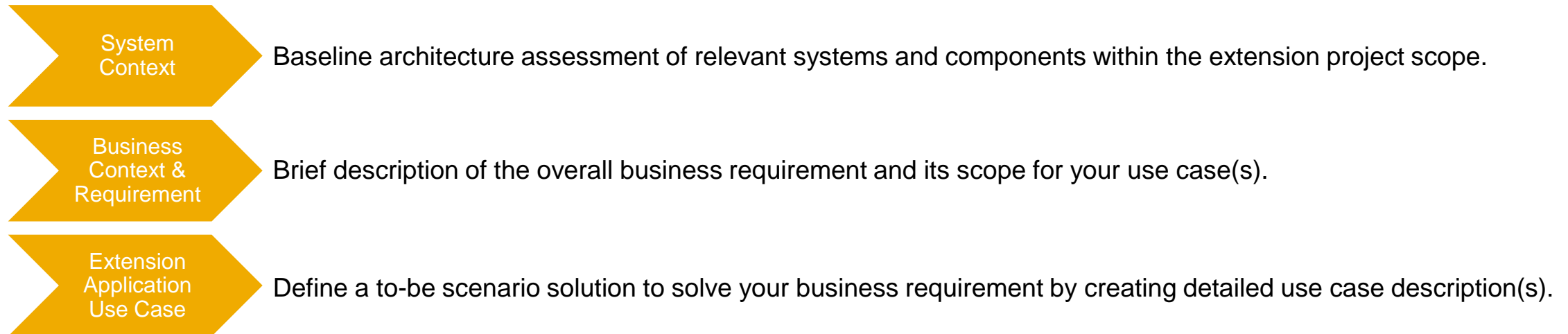
Extension Application Use Case Description
Template

	Extension Name	Business Context	Contributor and Role	Volumetrics	…	Scene description			
Actions	• Description of visualization and interaction • What actions does the user perform in which User Interface?								
Application Logic	• What existing process needs to be extended? • How does the extension work together with existing process application logic? • What application logic needs to happen within this extension?								
System	• Description of existing systems. • Needs to be mapped to system context. • How does the extension work together with existing systems?								
Required Data	• Description of required data for the extension. Which data is from the core system? • Where is the data for the extension created and stored? • Is there a need for a data persistence in the core solution?								

Extension Application Use Case Scene
Template

	Scene 01:		Scene 02:		Scene 03:		Scene 04:	
Actions								
Application Logic								
System								
Required Data								

Use Case: External Business Partner Validation
Business Case and Task Description

Business Case:

ACME Corporation needs help with the validation of new business partners. Therefore, they buy and consume a service offering from iCredible. John is an employee of the company iCredible. Every time a new business partner is added in the SAP S/4HANA system of ACME Corporation, John would like to get notifications. John would then be able to review the business partner details. He would proceed to check the business partner's registered office and do some background verification. In a next step, John would update the verification details. Once the details are verified, the business partner gets activated in ACME Corporation's SAP S/4HANA system.

Architecture Principals and Business Context:

- Extensions needs to be upgrade stable
- Easy maintenance and using standard software/service are preferred
- Side-by-Side options are preferred due to "cloud first" strategy
- Only internal ACME Corporation Employees are allowed to have access to the SAP S/4HANA system
- Employees are used to work with SAP Launchpad

Your Role and Task:

You work for ACME Corporation, and you are part of the Enterprise Architecture team.

You want to create a target solution diagram in order to prepare the implementation of the extension use-case.
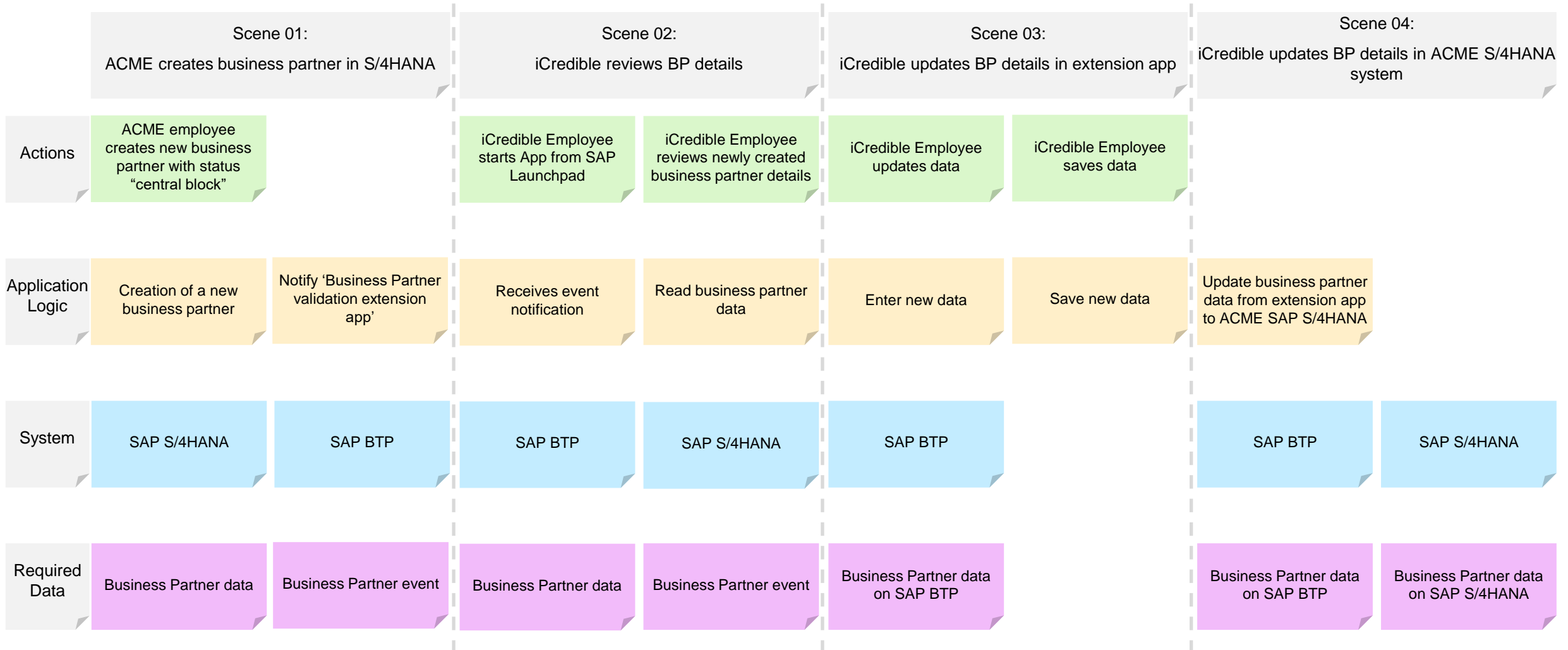
Recently, you learned about the SAP Application Extension Methodology, and you want to try out this approach for this project.
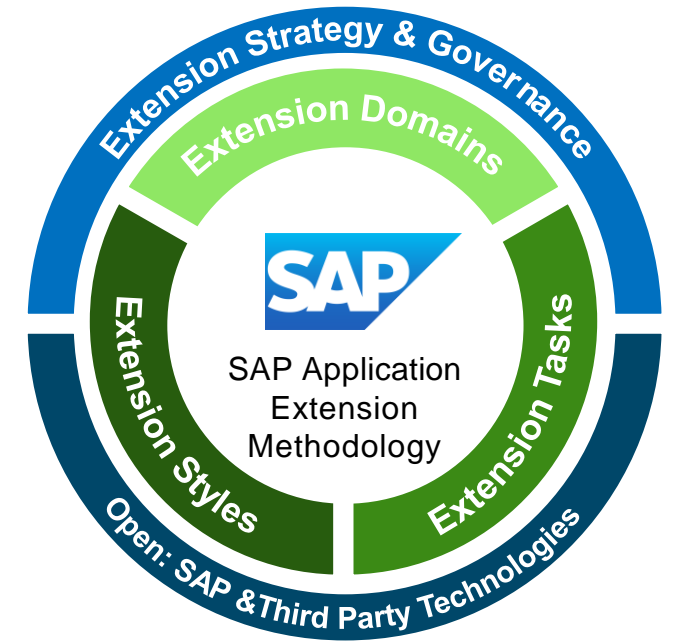
How To Use	Find out which systems are involved. Learn about the business context and requirement. Structure the use case into different scenes. Check Discovery Center for services. Translate business requirements from use case and try to find matching extension tasks. For each extension task find a fitting technical building block.

Use Case: External Business Partner Validation

Scene 01 - 04

	Scene 01: ACME creates business partner in S/4HANA		Scene 02: iCredible reviews BP details		Scene 03: iCredible updates BP details in extension app		Scene 04: iCredible updates BP details in ACME S/4HANA system
Actions	ACME employee creates new business partner with status "central block"		iCredible Employee starts App from SAP Launchpad	iCredible Employee reviews newly created business partner details	iCredible Employee updates data	iCredible Employee saves data	
Application Logic	Creation of a new business partner	Notify 'Business Partner validation extension app'	Receives event notification	Read business partner data	Enter new data	Save new data	Update business partner data from extension app to ACME SAP S/4HANA
System	SAP S/4HANA	SAP BTP	SAP BTP	SAP S/4HANA	SAP BTP		SAP BTP	SAP S/4HANA
Required Data	Business Partner data	Business Partner event	Business Partner data	Business Partner event	Business Partner data on SAP BTP		Business Partner data on SAP BTP	Business Partner data on SAP S/4HANA

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SAP Application Extension Methodology

Extension Strategy & Governance

Extension Domains

Extension Tasks

Extension Styles

Open: SAP & Third Party Technologies

SAP Application Extension Methodology

0	1	2	3
Overview	Assess Extension Use Case	Assess Extension Technology	Define Extension Target Solution

Phase 2: Assess Extension Technology

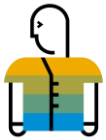### Description:

Understand Extension Styles, Extension Tasks and get an overview about possible Technical Extension Building Blocks. These will help you to translate the business requirements into technical requirements.

Involved Persona:

Enterprise Architect   Domain Architect

Goal:

- Understand and map Extension Styles, Extension Tasks to the use case
- Get an understanding about the available Technical Extension Building Blocks

Deliverables:

- Extension Tasks
- Indication of extension technology mapping

Extension Styles
Frame the overall technology for building extensions and structure extension tasks.
Extension Styles can be categorized into the Three-Tier Architecture model: Presentation Tier, Application Tier and Data Tier.
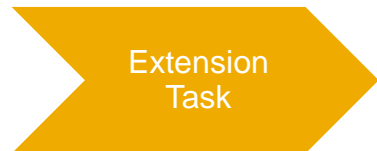
Extension Task
Describe technology agnostic extension task to solve a specific part of your extension use case description.
Extension Tasks can be categorized in Extension Styles.

Extension Technology Mapping
The extension technology mapping outlines the relationship between Extension Task and Technical Extension Building Blocks. Extension Tasks can be implemented by using one or more Technical Extension Building Blocks.
A Technical Extension Building Blocks can be categorized into Extension Domains such as Core Solution Extension Domain and Side-by-Side Extension Domain.
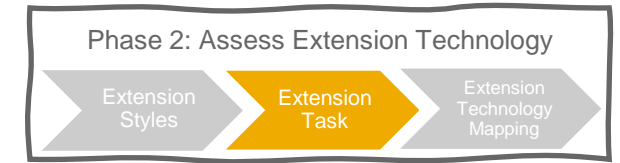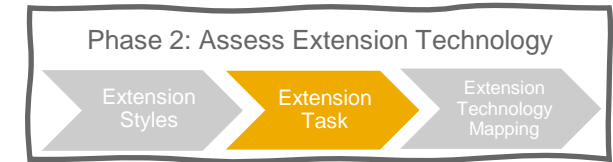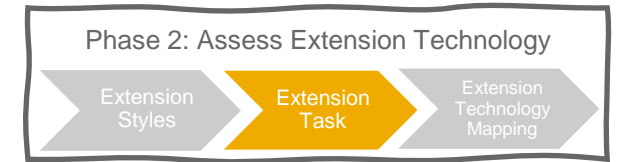
Extension Styles

Presentation Tier			Application Tier	Data Tier
User Interface Extension	New User Interface	Form and Template	Business Logic Extension	Data Model Extension
Adapt the standard user interface of the core solution by adding, removing and changing UI elements like labels, buttons, and input fields	Create a custom user interface in addition to or in replacement of a standard UI catering for specific usability needs	Adapt existing or create new forms and e-mail templates	Realize business requirements by implementing additional business logic, and add, exchange, or re-wire a process by creating additional process steps	Store additional information by extending the entities of an existing data model, or define a new data model

Explanation

Extension Styles frame the overall technology for building extensions and structure extension tasks.
They can be categorized into the Three-Tier Architecture model: Presentation Tier, Application Tier and Data Tier.

Extension Tasks for Presentation Tier

ID	Extension Style	Extension Task
P01	User Interface Extension	Adapt standard UI: add/hide/create/rename/rearrange label or headlines
P02	User Interface Extension	Add custom field to standard UI
P03	New User Interface	Create custom UI
P04	Form and Template	Create custom form templates based on standard object
P05	Form and Template	Create custom form templates based on custom object/process
P06	Form and Template	Adapt e-mail template

Extension Tasks for Application Tier

ID	Extension Style	Extension Task
A01	Business Logic Extension	Add business logic/pre-fill/validate fields before/within/after existing business process
A02	Business Logic Extension	Add rules within existing process
A03	Business Logic Extension	Add workflow within existing process
A04	Business Logic Extension	Add custom field to standard API
A05	Business Logic Extension	Create API
A06	Business Logic Extension	Consume API
A07	Business Logic Extension	Create Event
A08	Business Logic Extension	Consume Event
A09	Business Logic Extension	Create workflow
A10	Business Logic Extension	Create rules
A11	Business Logic Extension	Create application logic
A11	Business Logic Extension	Create and schedule a new background job

Extension Tasks for Data Tier

ID	Extension Style	Extension Task
D01	Data Model Extension	Create persistence
D02	Data Model Extension	Create custom business object
D03	Data Model Extension	Add custom field to existing business object
D04	Data Model Extension	Enrich/Expose Data Model

Extension Task Mapping
Template
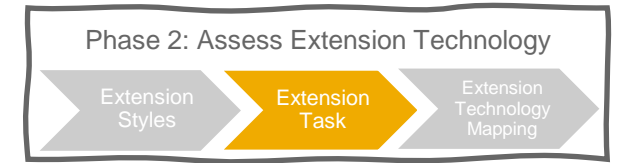
	Phase 1		Phase 2	
	Scene 01:		**Extension Tasks**	
Actions				
Application Logic				
System				
Required Data				

Use Case: External Business Partner Validation

Scene 02 – Phase 1 and Phase 2

Phase 1

Scene 02:
iCredible reviews BP details

| Actions | iCredible Employee starts App from SAP Launchpad | iCredible Employee reviews newly created business partner details |

| Application Logic | Receives event notification | Read business partner data |

| System | SAP BTP | SAP S/4HANA |

| Required Data | Business Partner data | Business Partner event |

Phase 2

Extension Tasks

| Actions | Create custom UI |

| Application Logic | Consume Event | Consume API |

Extension Domain

Extension Styles → Extension Task → **Extension Technology Mapping**

- An Extension Domain describes the "location" of the Technical Extension Building Block and explains where it "runs"

1 Core Solution Extension Domain:
Running on the same technology stack as the core solution
(Example: SAP S/4HANA Cloud)

Core Solution

> Core Solution Extension **1**

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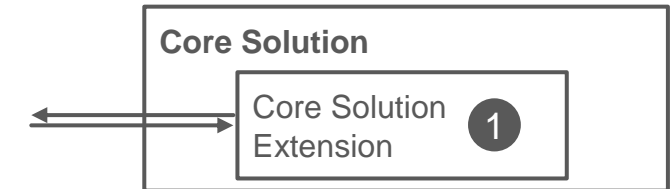
2 Side-by-Side Extension Domain:
Using extensibility capabilities outside the core solution based on standard APIs/events
(Example: SAP Business Technology Platform)

Side-by-Side Extension Platform

> Side-by-Side Extension **2**

Core Solution

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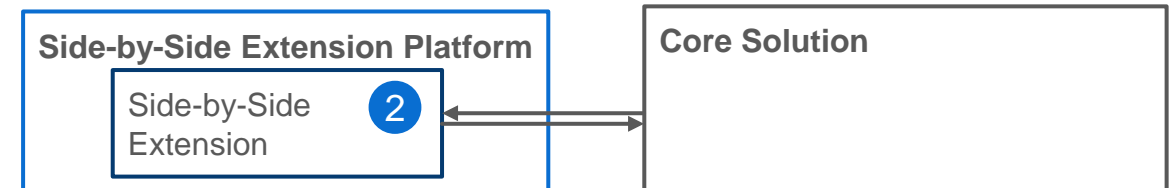
3 Hybrid Extension Domain:
Extension using a combination of Core Solution Extension and Side-by-Side Extension Domain

Side-by-Side Extension Platform

Hybrid Extension Domain

> Side-by-Side Extension

Core Solution **3**

> Core Solution Extension

Extension Technology Mapping

- The extension technology mapping outlines the relationship between Extension Task and Technical Extension Building Blocks.

- Extension Tasks can be implemented by using one or more Technical Extension Building Blocks.

- A Technical Extension Building Blocks can be categorized into Extension Domains such as Core Solution Extension Domain and Side-by-Side Extension Domain.

SAP Application Extension Methodology
EXTENSION TECHNOLOGY MAPPING

SAP Application Extension Methodology
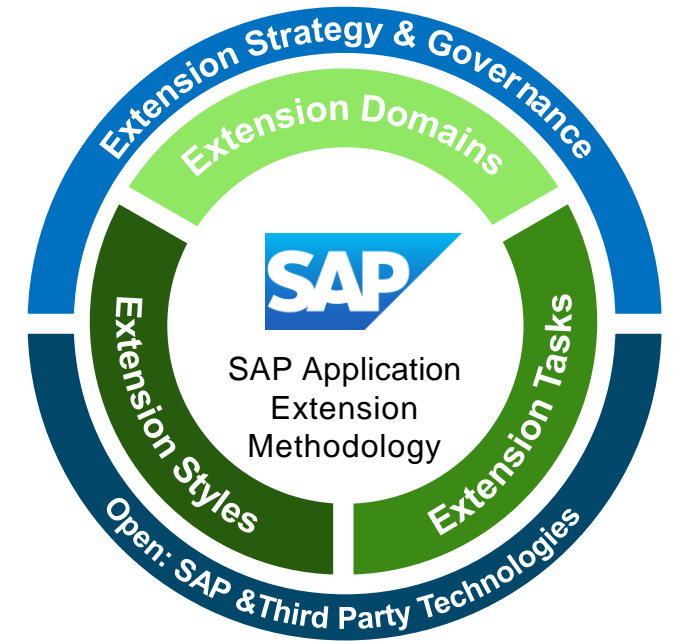
0	1	2	3
Overview	Assess Extension Use Case	Assess Extension Technology	Define Extension Target Solution

Phase 3: Define Extension Target Solution

Description:

Based on the overall requirements and the Technology Mapping in the previous phase, you can decide on Technical Extension Building Blocks to create your target solution.
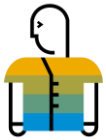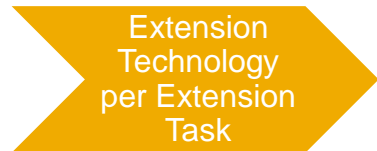
Goal:

Created Extension Target Solution e.g., as a diagram

Involved Persona:

Enterprise Architect   Domain Architect

Deliverables:

- Extension Tasks Guidance
- Decision on Technical Extension Building Blocks
- Extension Target Solution Reasoning
- Extension Target Solution

Extension Technology per Extension Task
Analyze and decide for each Extension Task (from previous phase) which Technical Extension Building Blocks are suitable.

Decision Guidance Assets
Use the decision guidance assets like Extensibility Guidance Documents, Discovery Center Missions, Use Case Patterns and Reference Architectures to choose your Technical Extension Building Blocks.

Extension Target Solution
Develop an Extension Target Solution e.g. as a diagram. This will be the preparation for your implementation.

Extension Tasks Guidance
Template

ID	Extension Style	Extension Task	Technical Extension Building Block	Guidance	Color Code
D01	Data Model Extension	Add custom field to existing business object	SAP Key-User Extensibility: Custom Fields App	<to be filled out by project team>	🟩
			SAP Classic: Customizing Include	<to be filled out by project team>	🟧
			SAP Classic: Append Structure	<to be filled out by project team>	🟧
			SAP Classic: Extension Include	<to be filled out by project team>	🟧
			SAP Classic: Table Modification	<to be filled out by project team>	🟥

Color Code	Description
🟩	<to be filled out by project team>
🟧	<to be filled out by project team>
🟥	<to be filled out by project team>

Extension Technology per Extension Task Mapping
Template

	Phase 1		Phase 2		Phase 3	
	Scene 01:		Extension Tasks		Technical Extension Building Block	
Actions						
Application Logic						
System						
Required Data						

Extension Technology Mapping: Create custom UI

	A	B	C	D	E
1	**Three-Tier Architecture**	**Extension Style**	**Extension Task**	**Extension Domain**	**Technical Extension Building Block**
12				Core	SAP Classic Dynpro
13				Core	SAP WebDynpro ABAP
14				Side-by-Side	SAPUI5 Freestyle deployed on BTP
15				Core	SAPUI5 Freestyle deployed on SAP S/4HANA
16				Side-by-Side	SAP Fiori Elements deployed on BTP
17				Core	SAP Fiori Elements deployed on SAP S/4HANA
18	Presentation tier	New User Interface	Create custom UI	Side-by-Side	SAP Mobile Services based UI
19				Side-by-Side	SAP Build Work Zone
20				Side-by-Side	SAP Task Center
21				Side-by-Side	Rapid Application Development by Mendix
22				Side-by-Side	SAP Build Apps
23				Core	SAP Key-User Extensibility: Analytical UIs

Use Case: External Business Partner Validation

Scene 02 – Phase 1, Phase 2 and Phase 3

	Phase 1		Phase 2	Phase 3	
	Scene 02: iCredible reviews BP details		**Extension Tasks**	**Technical Extension Building Block**	
Actions	iCredible Employee starts App from SAP Launchpad	iCredible Employee reviews newly created business partner details	Create custom UI	SAP Build Work Zone, standard edition	SAP Fiori Elements deployed on BTP
Application Logic	Receives event notification	Read business partner data	Consume Event / Consume API	SAP Event Mesh	OData API
System	SAP BTP	SAP S/4HANA			
Required Data	Business Partner data	Business Partner event			

Decision Guidance Assets for SAP S/4HANA

Type	Name
Guidance Paper	Custom Extension in SAP S/4HANA Implementations Extend SAP S/4HANA in the cloud and on premise with ABAP based extensions
SAP API Business Hub	Developer Extensibility
Missions	SAP Discovery Center Missions
Blog	SAP S/4HANA Extensibility: A Learning Journey Embedded Steampunk
Use Cases	SAP BTP Use Cases
SAP Help Portal	Extend and Integrate Your SAP S/4HANA

Extension Target Solution Diagrams & Icons

SAP Business Technology Platform Solution Diagrams & Icons

- With the official set of icons, design guidelines and sample diagrams you can create your own SAP Business Technology Platform solution diagrams using MS PowerPoint. They are intended to reach a better and faster understanding of SAP Business Technology Platform end-to-end solution scenarios as customer, partner, client, solution architect, project lead or developer by using graphical diagrams for visual learning.

- https://blogs.sap.com/2018/01/05/be-visual-use-official-icons-and-samples-for-sap-cloud-platform-solution-diagrams/
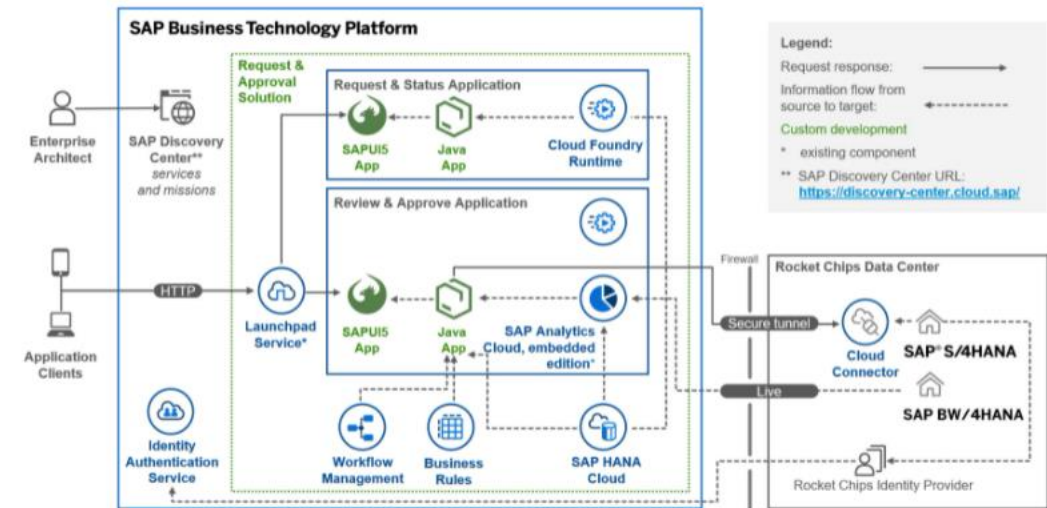
SAP Business Technology Platform – Solution Diagram example

Use Case: External Business Partner Validation
Extension Target Solution Diagram
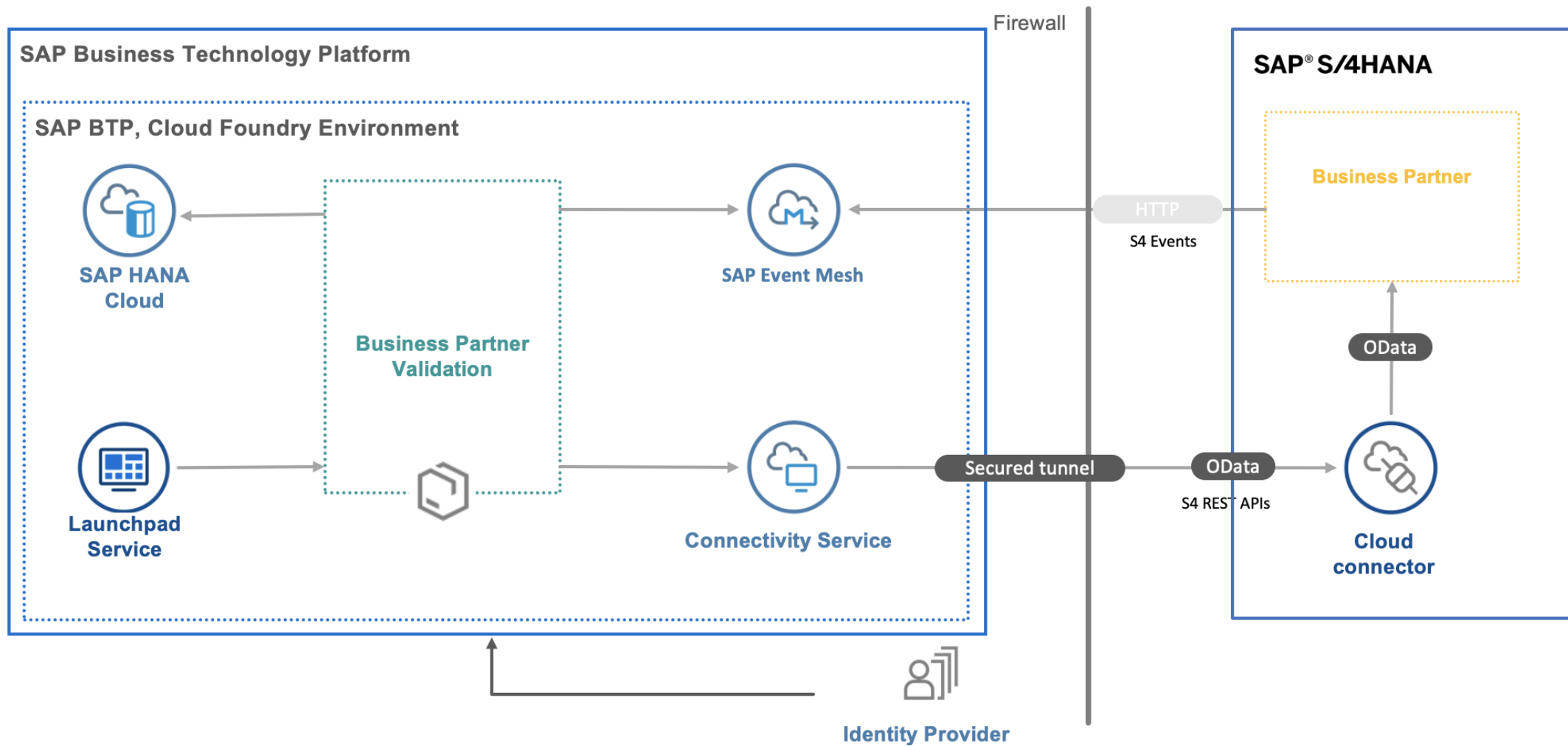
Q & A

Next Steps:
Request access to our community via e-mail:
sapaem@sap.com

Lean more on SAP Help Portal
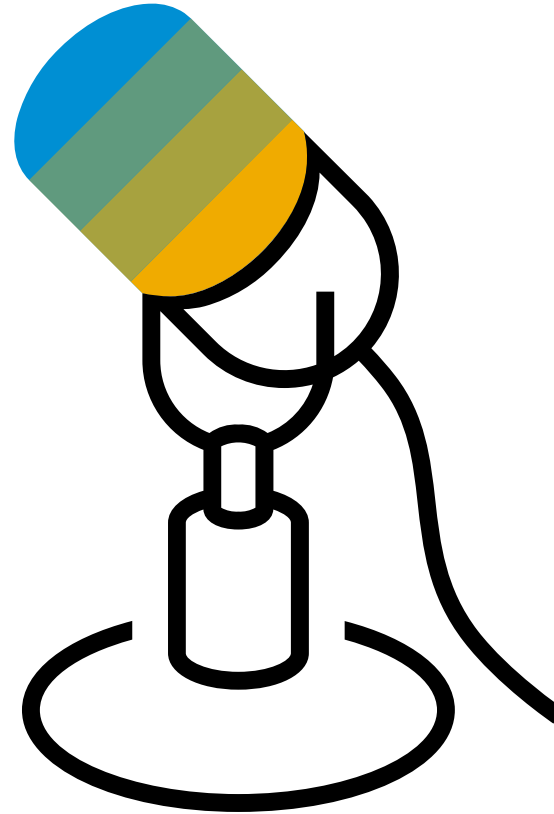
Thank you.

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