SAP Business Technology Platform Introduction

Thomas Jung, SAP
February 22, 2023

Public
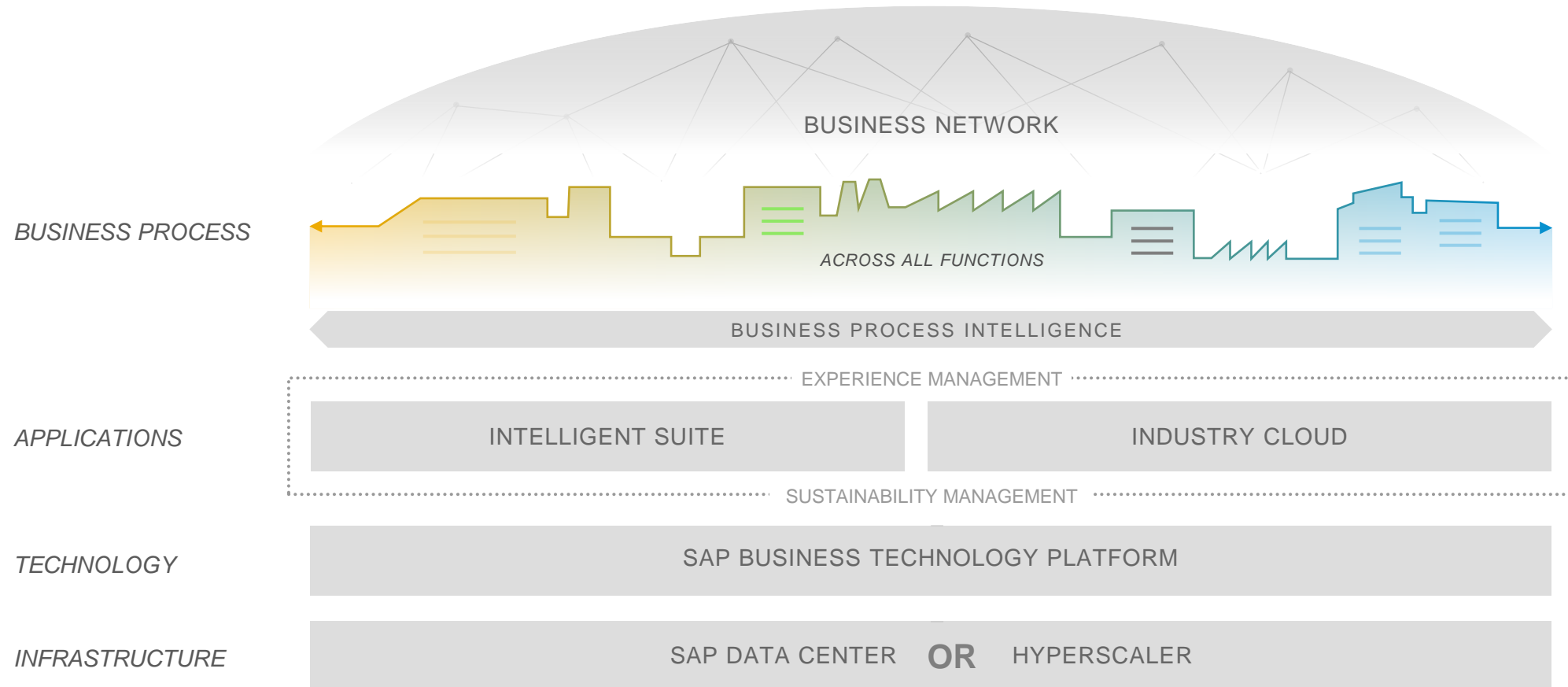
THE BEST RUN **SAP**

How it Feels With Everyone Else's Usage the Cloud

Public

How it Feels With Your Own Experience Moving to the Cloud

Public

INTELLIGENT ENTERPRISE

BUSINESS NETWORK

BUSINESS PROCESS

ACROSS ALL FUNCTIONS

BUSINESS PROCESS INTELLIGENCE

EXPERIENCE MANAGEMENT

APPLICATIONS

INTELLIGENT SUITE	INDUSTRY CLOUD

SUSTAINABILITY MANAGEMENT

TECHNOLOGY

SAP BUSINESS TECHNOLOGY PLATFORM

INFRASTRUCTURE

SAP DATA CENTER **OR** HYPERSCALER

Public
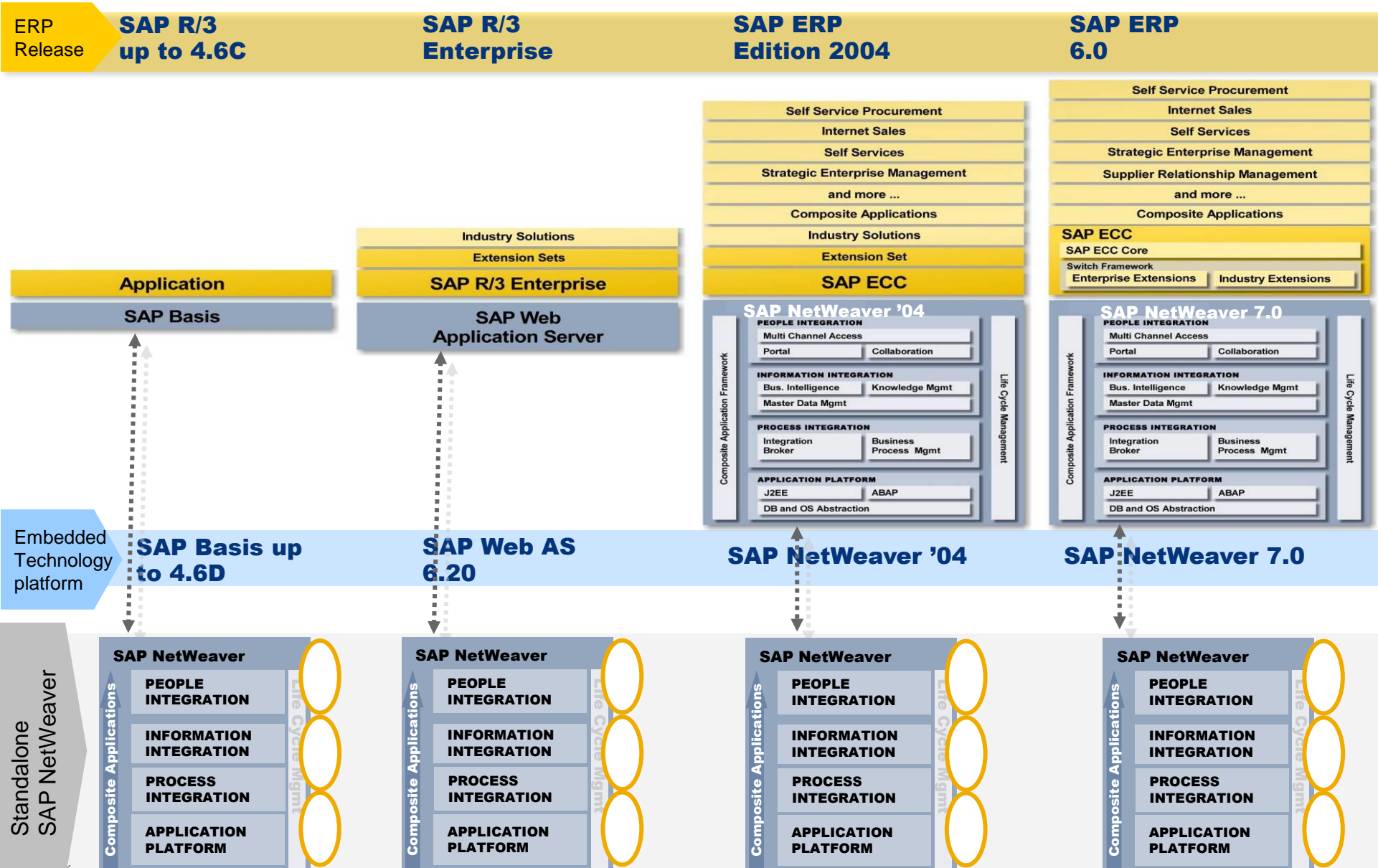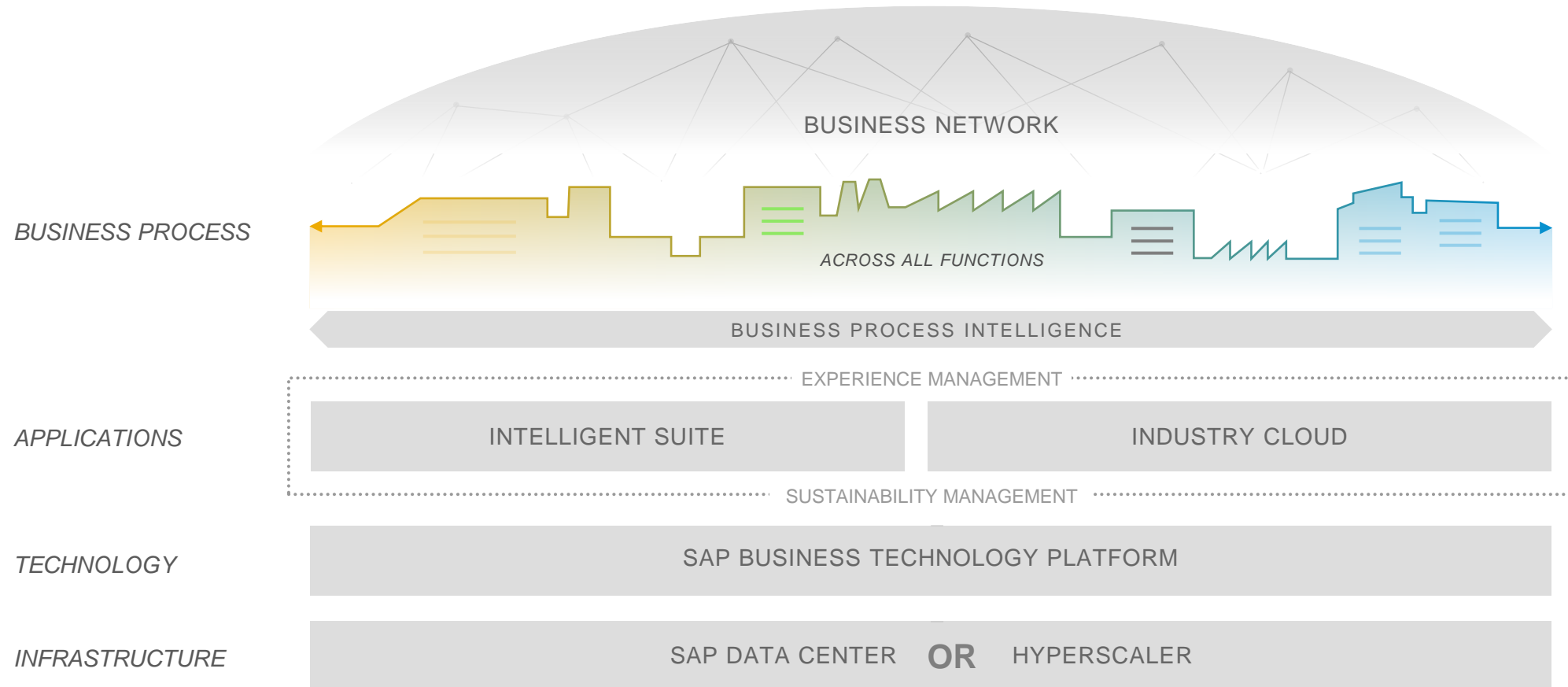
The Evolution of the SAP ERP Architecture:
Powered by SAP NetWeaver — Embedded and Standalone Connections

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TECHNOLOGY

SAP BUSINESS TECHNOLOGY PLATFORM

DATABASE & DATA MANAGEMENT

ANALYTICS

APPLICATION DEVELOPMENT & INTEGRATION

INTELLIGENT TECHNOLOGIES

INFRASTRUCTURE

SAP DATA CENTER **OR** HYPERSCALER

Public

SAP Business Technology Platform: Scenarios

TECHNOLOGY

SAP BUSINESS TECHNOLOGY PLATFORM

INTEGRATION	DATA-TO-VALUE	EXTENSIBILITY

RELATED PRODUCTS & SERVICES:

INTEGRATION

SAP Integration Suite incl.

- SAP API Business Hub
- SAP One Domain Model
- SAP Master Data Integration
- etc.

DATA-TO-VALUE

SAP HANA Cloud
incl. data lake capabilities

SAP Data Warehouse Cloud

SAP Analytics Cloud *incl. Planning*

SAP Data Intelligence

SAP Business Planning and Consolidation

EXTENSIBILITY

SAP Extension Suite incl.

Business Process Improvement

- SAP Workflow Management
- SAP Intelligent Robotic Process Automation

Development Efficiency

- SAP Business Application Studio
- No-code application development

Digital Experience

SAP AI Business Services

*product list not exhaustive

Public

SAP Extension Suite

iRPA

Workflow Management

Live Process Content

Process Mining

Conversational AI

Work Zone

SAP Fiori

Launchpad

Mobile

Tools

Programming Models

Runtimes

Digital Process Automation

Digital Experience

Development Efficiency

Extension Suite

Side-by-Side Extensibility

Central management plane
Secured and Managed Connectivity

Intelligent Enterprise

SAP SuccessFactors

SAP S/4HANA and ECC

SAP Ariba

SAP Concur

SAP Customer Experience

SAP Fieldglass

3rd Party

Runtime Choices

Cloud Foundry   **Kyma**   **ABAP**

Public

When to use what?

Your developers skillset

Your software assets

Your scenarios and use-cases

DECISION CRITERIA

Programming model

Language

Regions

Degree of control

Runtime Choice

	ABAP	Cloud Foundry	Kyma	Pure Gardener
RAP	X			
CAP		X	X	(X)
Microservices		X	X	X
Very "particular" programming language	(ABAP)		X	X
Simplicity vs. empowerment	S	S	E	E

Opinionation ←————————————————→ Flexibility

Deployment Options for your Applications

|	**Cloud Foundry Runtime**	**Kyma Runtime (K8s)**	**ABAP Environment**
Pros	• Platform-managed Load balancing, Routing, Health checks, Security Updates • Free choice of programming models (CAP, Java, etc) • Built on industry-standard, open-source technology components • Multi-cloud deployments and no infrastructure vendor lock-in	• Free choice of programming languages and -models (containerized deployments) • Combines microservices and serverless functions • Brings built-in managed service mesh • Built on industry-standards and open technology projects / components • Out-of-the-box consumption of SAP and hyperscaler services	• Integrated development lifecycle • Fast prototyping with ABAP RESTful programming model • Reuse existing on-prem ABAP assets
Good for	• Enterprise-grade business applications and services • Cloud-native web applications • Small to medium extension build with CAP/Low-Code tooling	• Cloud-native development of apps and services • Highly scalable, microservice-based apps • CAP-based applications	• User centric process extensions • Robust, transactional cloud apps • Migrate and adapt add-ons to the cloud • Enabling ABAP developers to go to the cloud
Skills	• Understanding of Core Data Services • SAP Fiori/UI5 and SAP HANA • Expertise in Java/Node.js or in any major programming language	• Kubernetes knowledge • Docker • Microservices • NodeJS and Python for serverless functions • Any major programming languages	• Ability to write modern ABAP code • Core Data Services • SAP Fiori and SAP HANA

Cloud Foundry and Kubernetes side-by-side

Cloud Foundry: Opinionated PaaS

- `cf push` experience → buildpacks as enabler
- Patching underlying stack done by
  Cloud Foundry/platform provider
- Stateful backing services "assumed to exist"

Kubernetes: Generic Runtime

- Can run everything that Cloud Foundry can run
- Can run many workloads that CF cannot run
- Developers need to care how, spend the effort

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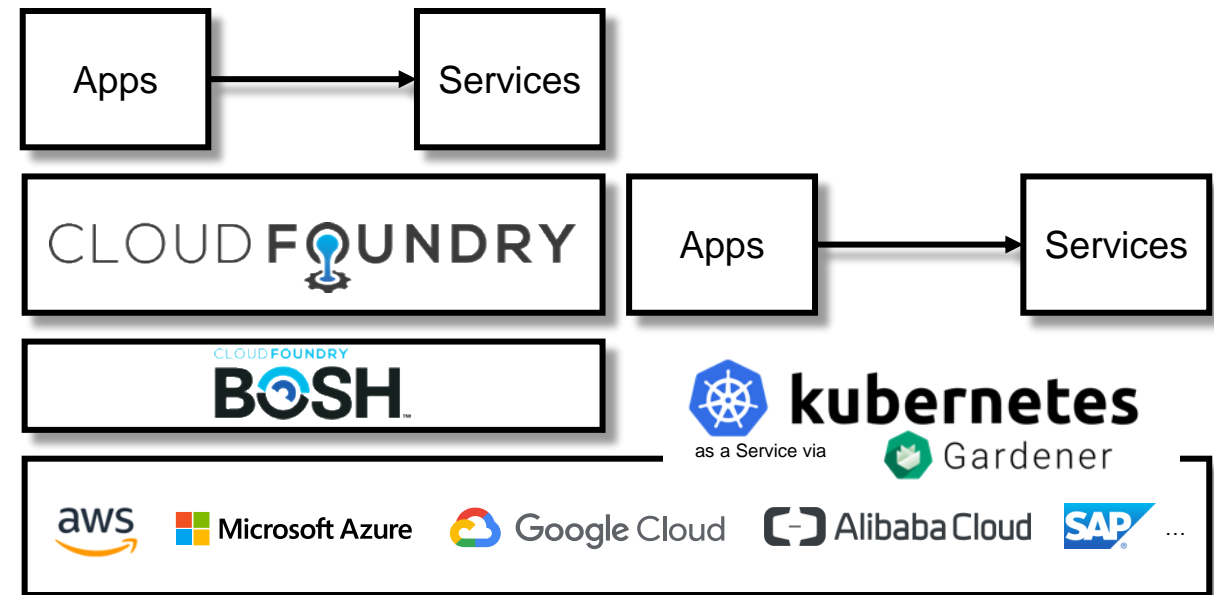
Cloud Foundry and Kyma Runtime: The Choice is Yours

Cloud Foundry

"Here is my source code

Run it on the cloud for me

I do not care how"

Kubernetes

"Here's my code

I'll tell you exactly how you should run it on the cloud for me

And don't you dare make any assumptions on the deployment without my written consent!"

"Cloud Foundry and Kubernetes – Where do they differ? How do they fit together?" Sanjay Patil, Posted on October 19, 2018
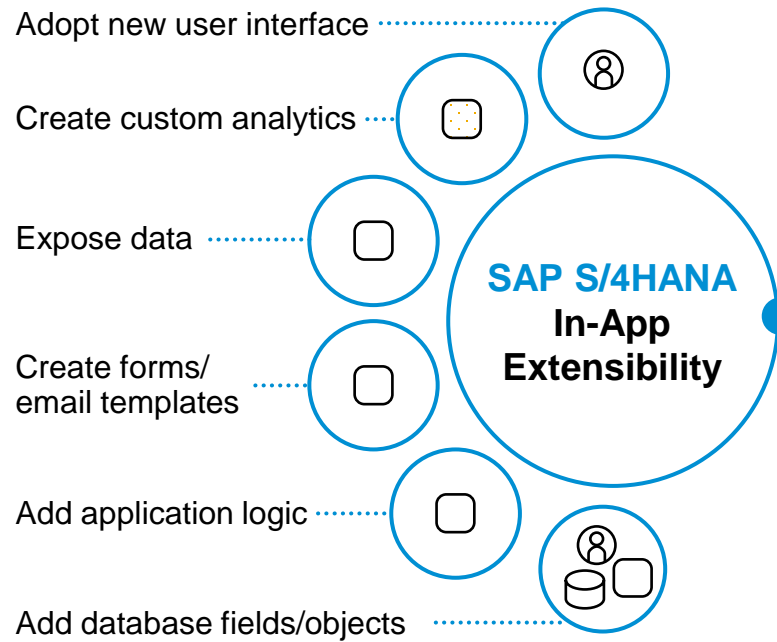
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Cloud Foundry and Kyma Runtime: The Choice is Yours

Simplicity
with in-built opinions to shied app developer from complexities of IaaS, etc.

Vs.

Empowerment
with greater control to shape deployments and utilize infrastructure, etc.

"[Cloud Foundry and Kubernetes – Where do they differ? How do they fit together?](#)" Sanjay Patil, Posted on October 19, 2018

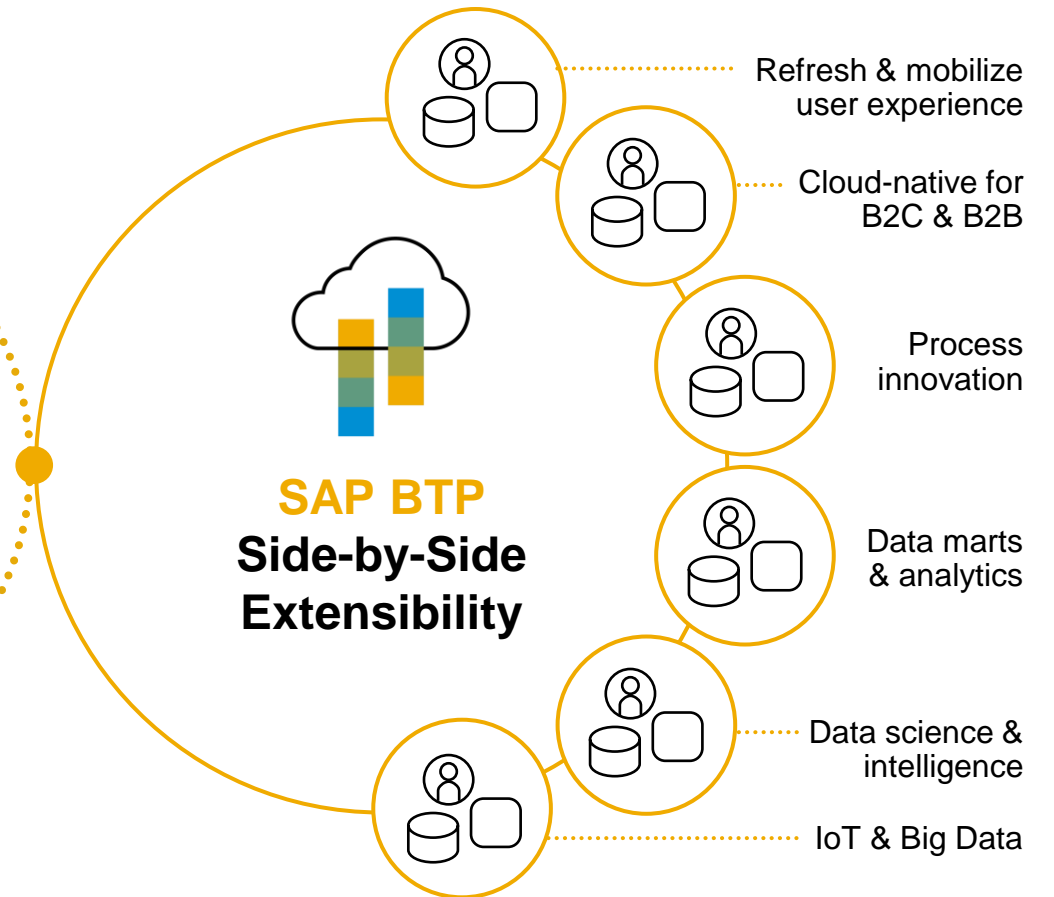# Building Extensions for the Intelligent Enterprise on SAP BTP

SAP SuccessFactors

SAP S/4HANA Cloud + On Premise[1]

SAP Customer Experience

SAP Fieldglass

SAP Concur

SAP Ariba

SAP Enterprise Core Components

Other SAP Solutions

3rd Party Solutions

[1] Planned innovation

Management Plane

Cloud Connector

Connection Service

Secured & Managed Connectivity
Central APIs & Events Registry

Development Efficiency Tools/Services/SDKs

SAP Cloud SDK	SAP Business Application Studio	ABAP Development Tools for Eclipse (ADT)

SAP Cloud Application Programming Model (CAP)

ABAP RESTful Programming Model (RAP)

Event Bus   Event Mesh

Kyma Runtime

Serverless Runtime

Cloud Foundry Runtime

ABAP Environment

Public

Extensibility with SAP S/4HANA

In-App Extensions ←——————————————→ **Cloud Extensions**

Adopt new user interface ··········

Create custom analytics

Expose data ··········

SAP S/4HANA
In-App
Extensibility

Create forms/
email templates ··········

Add application logic ··········

Add database fields/objects ··········

Integration

← User Interface →
← Rules / Workflow →
← Process / Events →
Data Replication →

SAP BTP
Side-by-Side
Extensibility

Refresh & mobilize
user experience

Cloud-native for
B2C & B2B

Process
innovation

Data marts
& analytics

Data science &
intelligence

IoT & Big Data

User Interface Layer ⊙   Application Layer ▢   Database Layer ⛁

ABAP Details

ABAP RESTful Application Programming Model – The Mission

… for the development of
 SAP Fiori apps and
 Web APIs…

… for customers and partners in **SAP S/4HANA**

… for SAP internal development in **SAP S/4HANA**

… for customers and partners in
 SAP BTP ABAP Environment

… offering an end-to-end experience
 standardized development flow
 best practices & development guides
 high development efficiency
 focus on business logic, rather than technical aspects

PROVIDE A PROGRAMMING MODEL …

… supporting the product qualities
 User experience: SAP Fiori and SAP HANA
 Cloud: scalability
 ABAP assets: non-functional requirements

… and being flexible
 Break-outs for non-standardized implementations
 Out-of-the-box extensibility & verticalization
 Reuse components / APIs in "freestyle" development scenarios

Vital parts of SAP Business Technology Platform (BTP), ABAP environment

SAP BTP cockpit

SAP Fiori tools

ABAP development tools in Eclipse

Git code management

SAP Business Technology Platform, ABAP environment

ABAP RESTful application programming model

Cloud-optimized ABAP language

Released APIs

Connectivity

SAP HANA

SAP BTP services

SAP Integration suite

SAP Launchpad service

SAP Workflow service

Analytics

...

SAP Business Technology Platform

SAP Cloud Connector

SAP S/4HANA
SAP Concur
SAP SuccessFactors
SAP Ariba

Cloud

Cloud

WEB API

On premise

SAP S/4HANA
SAP system
Non-SAP system

CAP Details

Cloud Application Programming Model - Introduction

We complement *cloud-native technologies* with…

- a **CDS-based Services** framework…
- w/ intrinsic **enterprise** & **cloud** qualities

w/ *1st-class support* by and for…

- **SAP Business Application Studio**
- **SAP Fiori**
- **SAP HANA**
- **S/4 Extension** scenarios, …

without lock-in!

→ **Guidance** and **best practices** leveraging proven SAP technologies **+** Open-Source software

→ A *consistent* end-to-end **programming model** for *enterprise* services & applications

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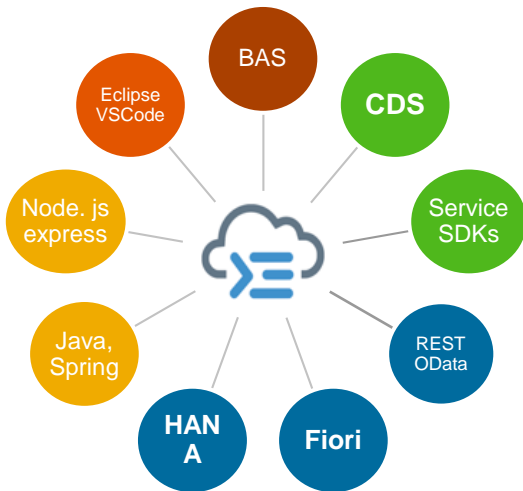
CAP Context and our focus

Frontends / UIs

Scaling

Profiling

Monitoring

Identities

Authentication

API Management

Destinations

Connectivity

Your Services and Apps

Provisioning

CI/CD

Databases

SAP HANA

Big Data

Caching

Consumers

Services

Data

Setup

Develop

Run

Test

CI/CD

Operate
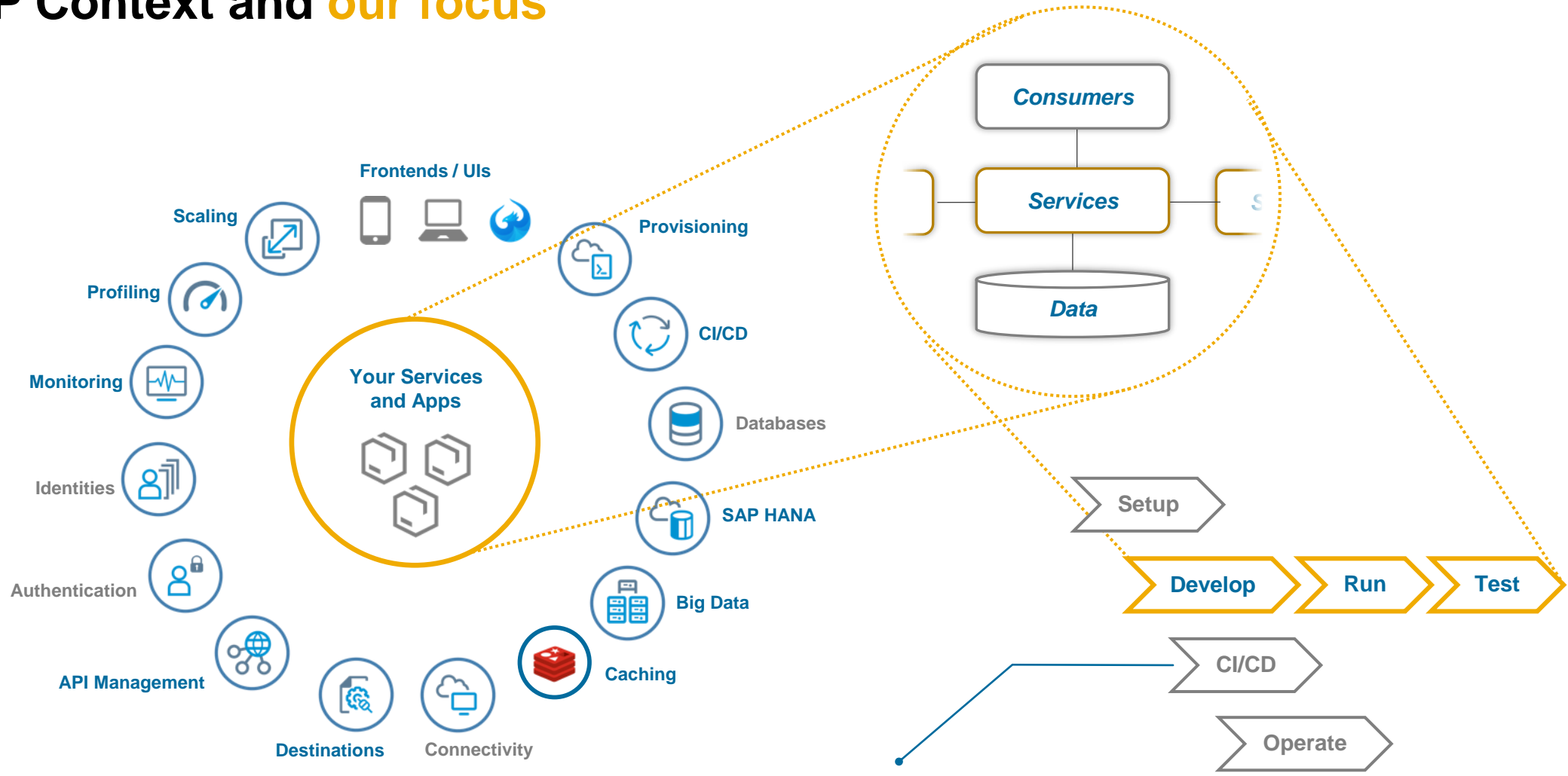
by SAP Cloud SDK, …

Low-/No- Code

Critical Digitalization Challenges

Organizations Fail to Innovate at the Speed the Business Demands

Rapidly evolving customer requirements accelerating demand for cloud solutions

"The pandemic is accelerating cloud demand, with 59% of enterprises expecting cloud use to exceed plans due to COVID-19."[1]

Limited development resources, inhibiting digitalization

"Lack of skills was cited as the number-one challenge in a recent Gartner Research Circle survey, and CIOs identified the 'lack of skills and resources' as the biggest barrier to success."[2]
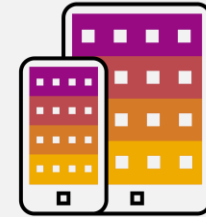
Complex IT landscapes, with a growing number of applications maintained by companies

Large companies maintain 129 different applications on average, with the total number increasing by 68% since 2015.[3]

1. "Maximizing the Impact of Technology Investments in the New Normal," CIO Insider, Deloitte, 03 February, 2021, Khalid Kark, Jagjeet, Gill, and Tim Smith.
2. "Forecast Analysis: Low-Code Development Technologies," 22 January 2021, Fabrizio Biscotti, Paul Vincent, Jason Wong, Laurie Wurster. GARTNER is the trademark and service mark of Gartner Inc., and/or its affiliates and has been used herein with permission. All rights reserved.
3. "Employees Are Accessing More and More Business Apps, Study Finds," The Wall Street Journal, 07 February, 2019, Angus Loten.

Accelerated Time to Value with Low-Code/No-Code
Unified Offering Across App Development, Process Automation & Digital Experience

Business Processes
- Enterprise Resource Planning
- Supply Chain
- Customer Experience
- Human Resources

BUSINESS USER

Digital Experience
- SAP Work Zone
- SAP Launchpad service
- SAP Mobile Start

Low-Code/No-Code Capabilities

Business Process Intelligence
Signavio • SAP Process Insights

Customer Insights
Qualtrics

CITIZEN DEVELOPER

Automation
- SAP Process Automation
  - Workflow Management
  - Intelligent Robotic Process Automation

PRO DEVELOPER   **CITIZEN DEVELOPER**

Application Composition
- SAP Business Application Studio
- SAP AppGyver

Marketplace
Pre-built LoB & industry specific content from SAP and partners

POWERING
SAP
BTP

DevOps
Application Lifecycle Management

Public

How Can You Meet the Growing Application Need?

Scale Development by Empowering More Employees to Build Software

Professional developer

- Uses tools of choice to create cloud native applications and reusable services
- Designs, develops, deploys, tests, and hands over to production
- Understands the concept of a development lifecycle, testing, and versioning
- Ensures governance and security

Citizen developer

- Creates and publishes low-code/no-code apps and customizations with close links to business contexts
- Is unaware of testing, go-live, versioning, and termination but learns through citizen development education
- Ensures governance and security through IT-sanctioned tools and platform-supported processes

Professional developer

Citizen developer

Pro-code   Low-code   No-code

Development democratization

High

Low

Low   Application volume   High
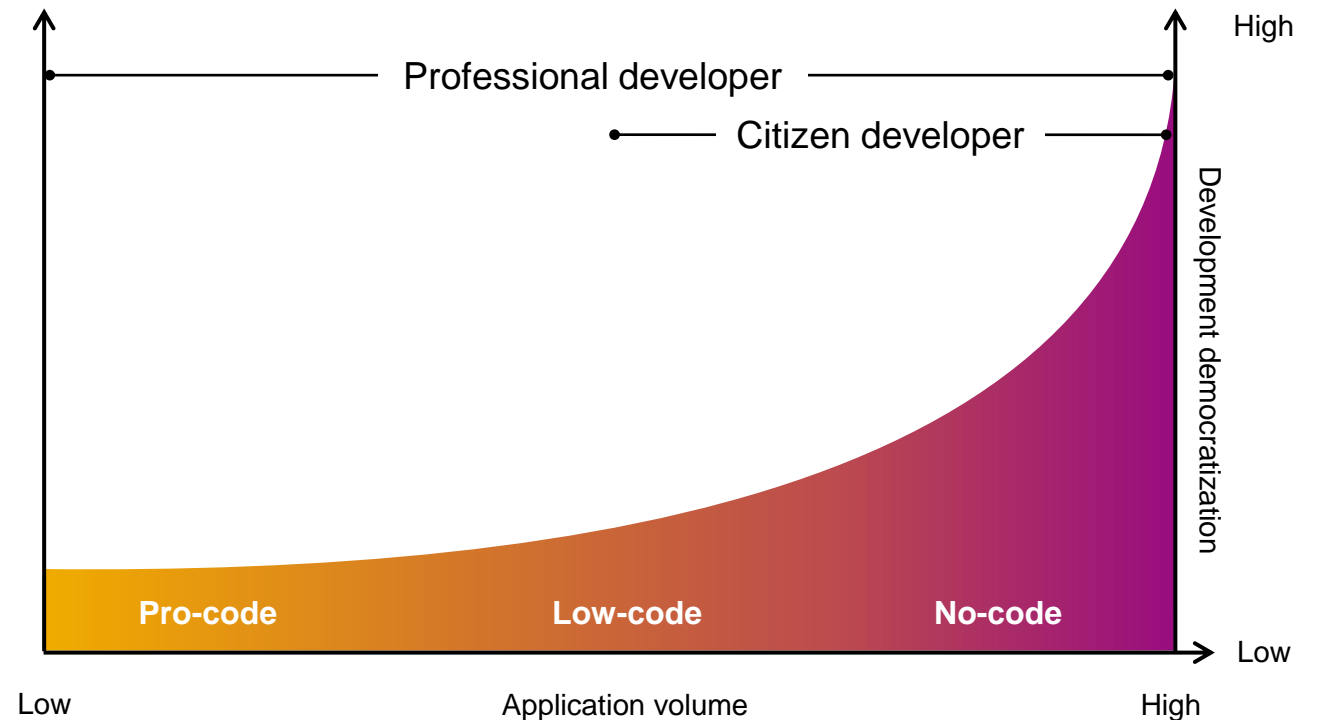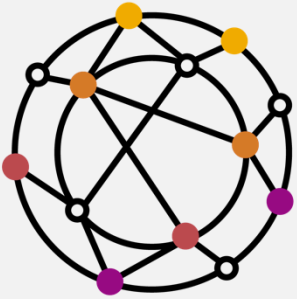
Create a **unified developer experience** that allows every developer to build apps fast, no matter the skill level

Professional developer

Citizen developer

SAP Build

SAP Business Application Studio

Standard IDEs*

for low-code development

Professional experience

Development democratization

High

Low

Pro-code

Low-code

No-code

Low — Application volume — High
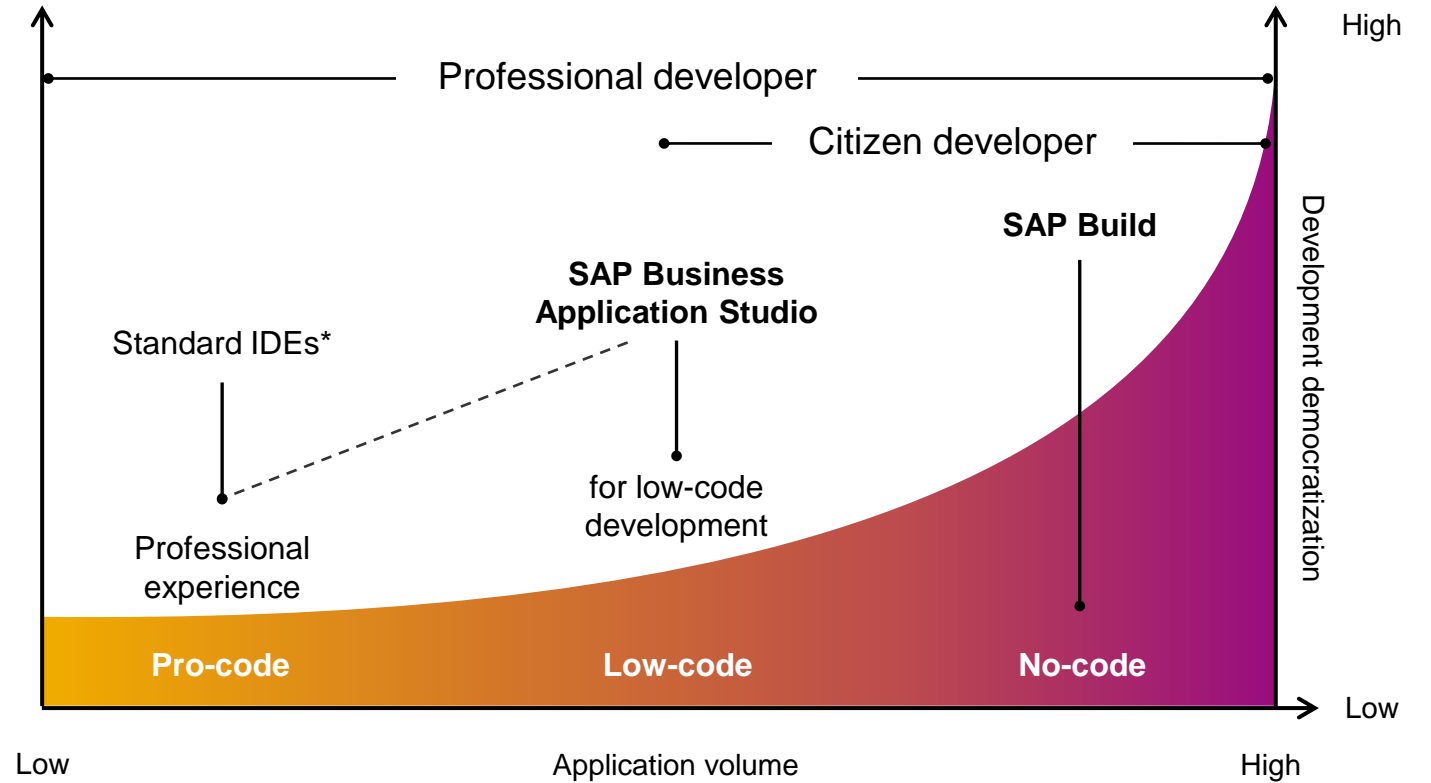
*i.e. VS Code + extensions

Application Development: SAP Build Apps
Build Quality Apps Without Compromise

The world's first professional no-code platform, enabling you to build apps for all form factors, including mobile, desktop, browser, TV and others

Drag-and-drop the user interface design
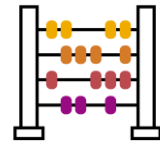
Use over 400 built-in formula functions

Create any logic visually

Bring your own data with pre-defined integrations

Deploy apps to various platforms

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Customer Success: DHL Freight

Scaling European Fleet Management with One Application

Using SAP Build Apps, international logistics firm DHL Freight created an application to better manage damage reports for its trailer fleet across Europe. Created by a small team, the app increased the reliability of reporting while making inspections more convenient for employees in the field.

App features

- Integration with the company's trailer fleet data
- Role- and region-based user authentication
- Localization to multiple languages
- Native iOS and Android apps and a Web-based administrative interface
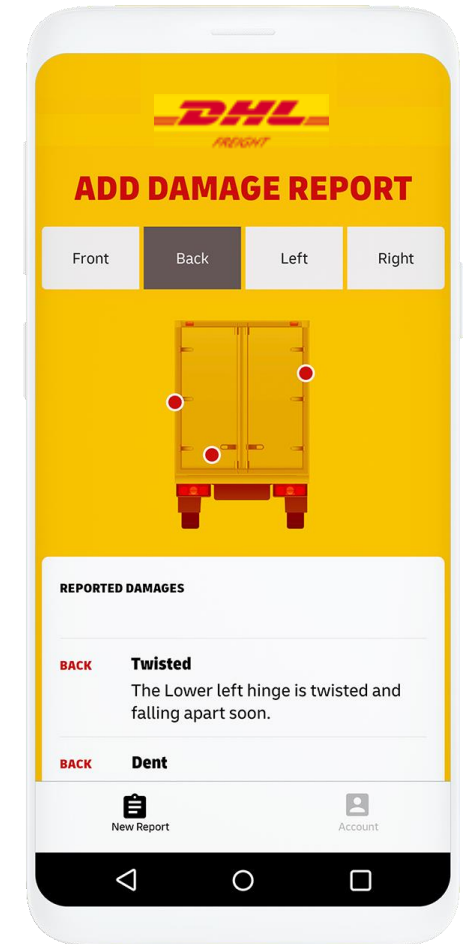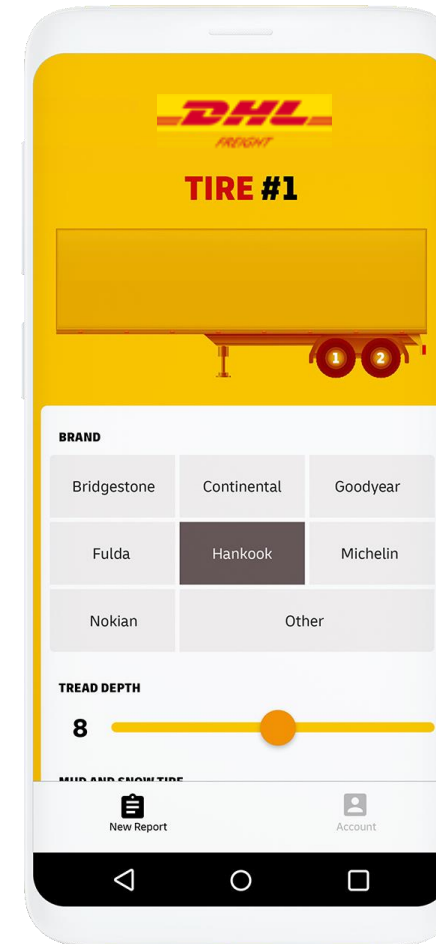
SAP Business Application Studio: **The low-code approach**

Scale your Development and Build Smarter Enterprise Apps.

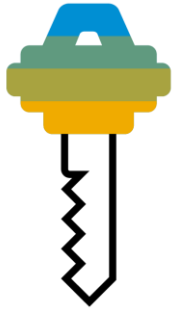- Low-code development environment, **tailored for efficient development** of business applications for the Intelligent Enterprise
- **Tight integration** with SAP services, technologies, and systems

- **Modern and intuitive** web user interface
- **Simplified, faster setup** of the development environment

- **Accelerated time-to-market** with high-productivity development tools

Public

Key capabilities of **SAP Business Application Studio**

Use a Modern, Integrated Development Environment for Today's Developers.

Single project studio for citizen developer projects
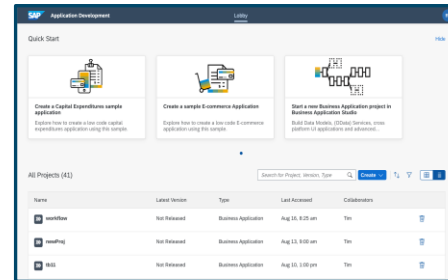
Simplified project artifact structure and dependencies
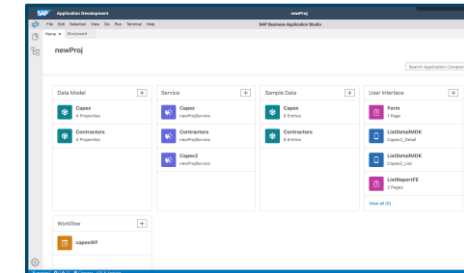
Visual data and service modeling
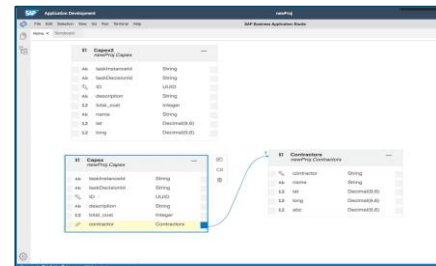
Low-code template-based and freestyle UI development
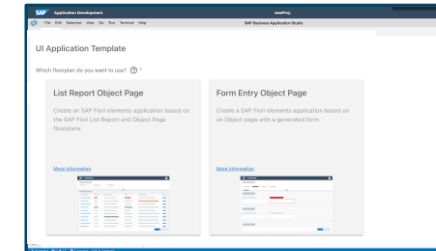
Service center
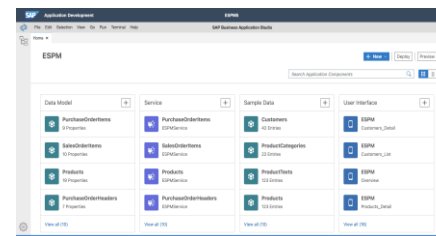
Single-click preview and deployment

Public
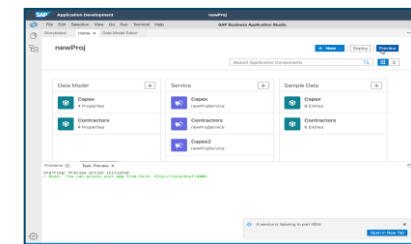
Benefits of **SAP Business Application Studio**

Efficiently Develop Business Applications for Your Intelligent Enterprise.

The new low-code capabilities of SAP Business Application Studio include:

- Deliver the applications the business needs when it needs them
- Improve productivity
- Increase the organization's developer (talent) pool
- Enable anytime, anywhere availability in the multi-cloud SAP environment
- Develop and extend SAP solutions
- Allow for collaboration between citizen developers and professional developers

SAP Business Application Studio on BTP* Multi-Cloud

General Availability on Azure, AWS, and Ali-Cloud

A **modern** development environment, **tailored** for efficient development of business applications for the **Intelligent Enterprise scenarios**
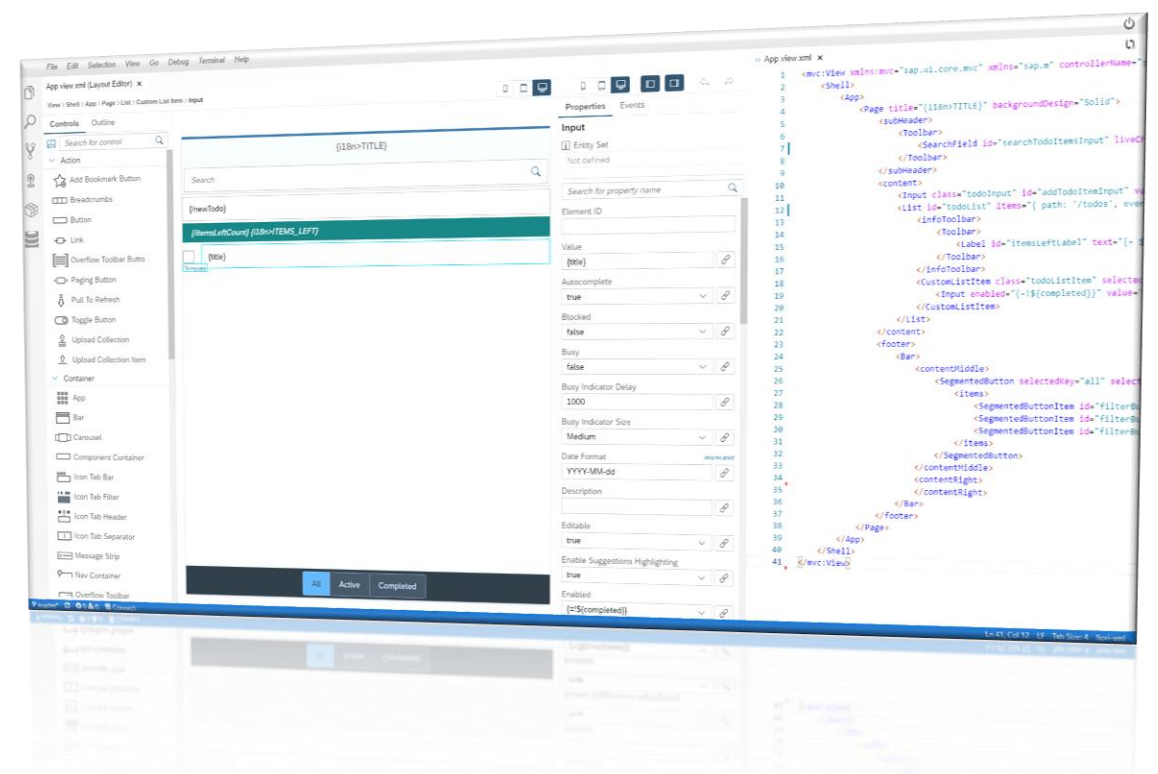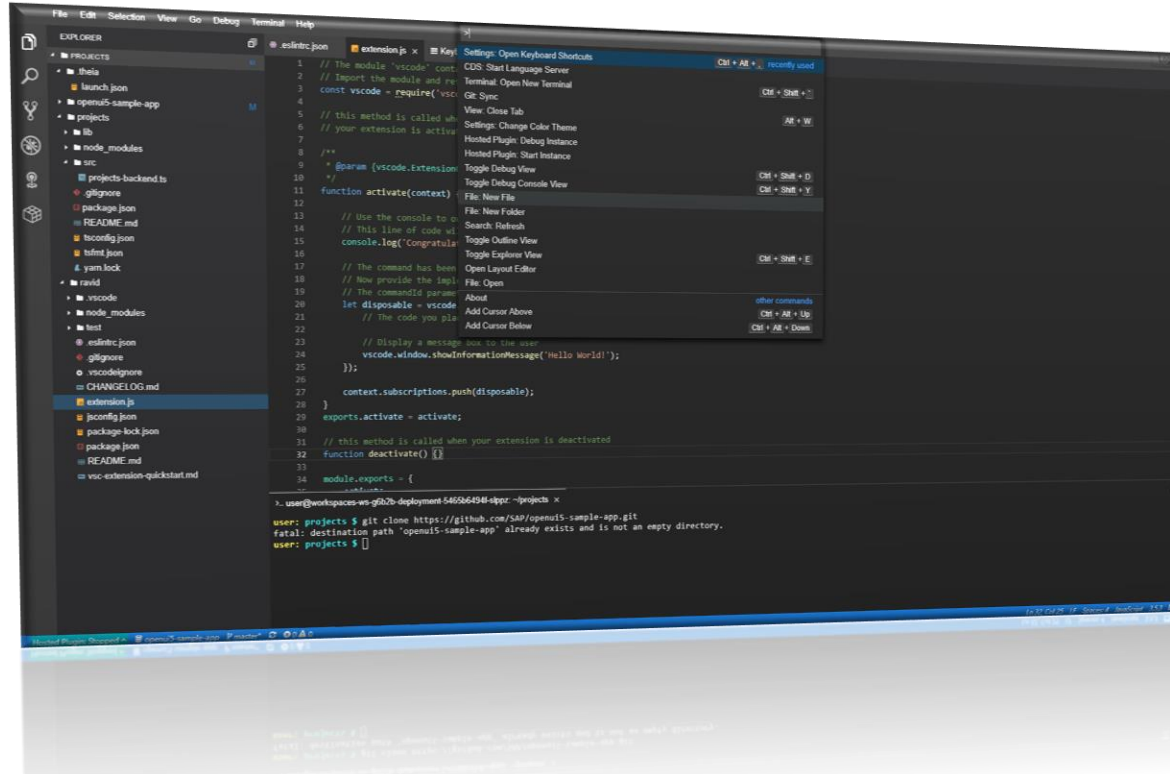
* SAP BTP: SAP Business Technology Platform

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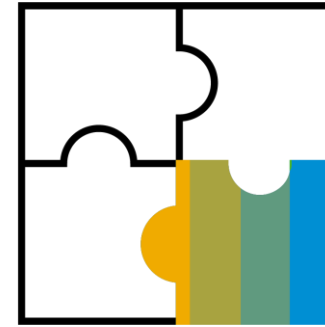# SAP Business Application Studio
Value Proposition

Turn-key Solution

Instantly spin-up pre-packaged environments with tools and runtimes, tailored for developing SAP business applications

Simplified Development

Enjoy a seamless end-to-end development environment with a desktop like experience in the cloud - available anywhere, anytime

Integrate SAP Solutions

Build smarter, more intelligent applications integrating SAP services, technologies, and solutions to cater for your business needs
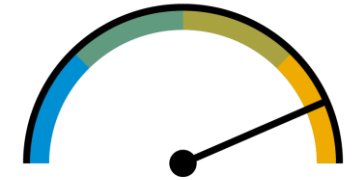
Ultimate Productivity

Accelerate app development using wizards, optimized code & graphical editors, local test run & debug, terminal (CLI) access, quick deployment, and more

SAP Business Application Studio is built on Open Source and leading industry standards

Public

SAP Business Application Studio

Key Use Cases

Build web apps with
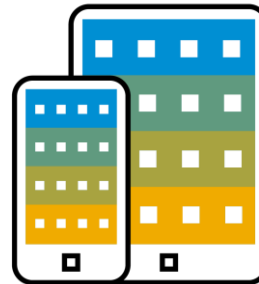SAP Fiori and SAPUI5

Extend SAP Solutions

Create serverless
extensions

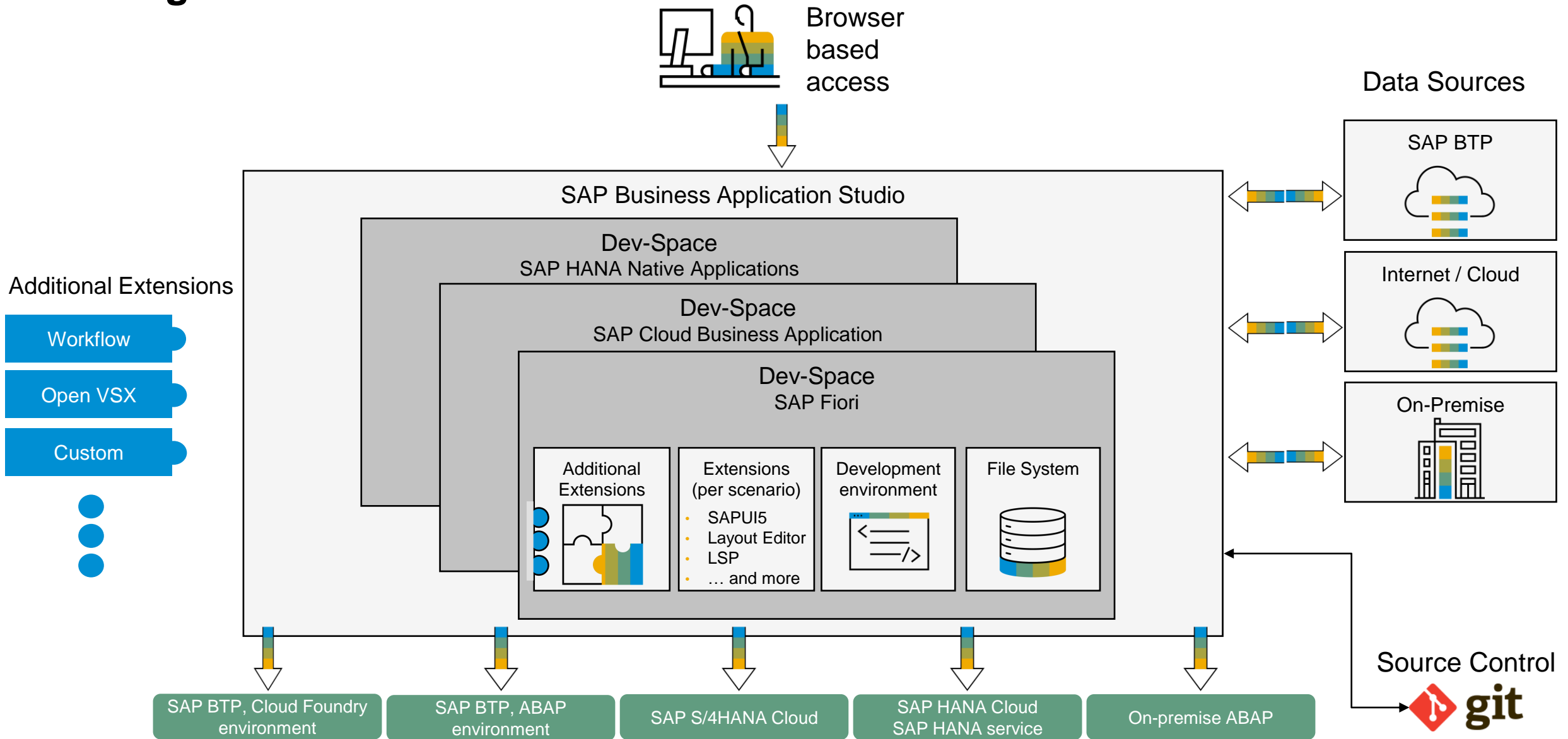Digital process automation using
SAP Workflow Management
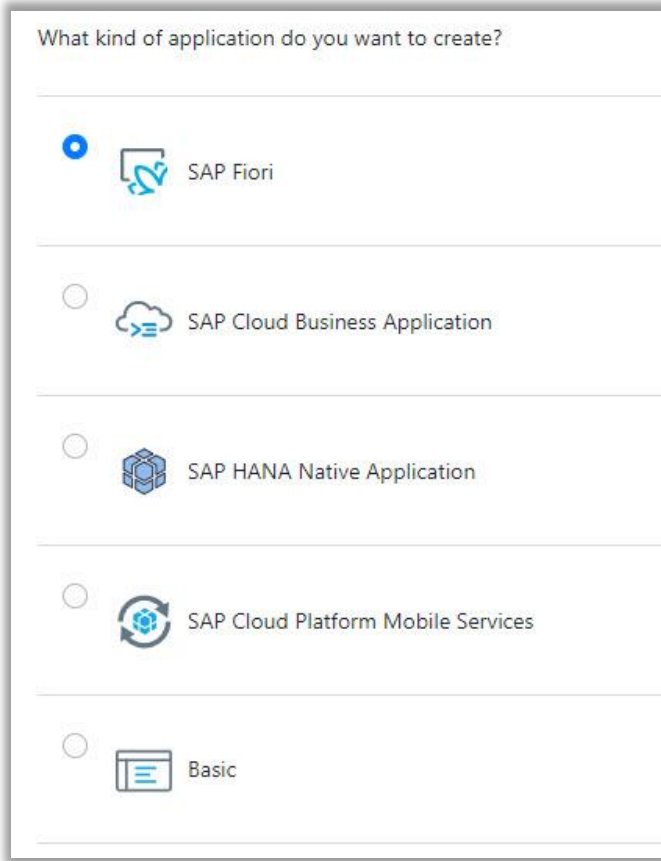

Mobilize your
Business

Develop SAP HANA
Native applications

This is the current state of planning and may be changed by SAP at any time.

Public

The Big Picture

Browser based access

Data Sources

SAP Business Application Studio

Dev-Space
SAP HANA Native Applications

Dev-Space
SAP Cloud Business Application

Dev-Space
SAP Fiori

Additional Extensions	Extensions (per scenario)	Development environment	File System
	• SAPUI5 • Layout Editor • LSP • … and more		

Additional Extensions

- Workflow
- Open VSX
- Custom

SAP BTP

Internet / Cloud

On-Premise

SAP BTP, Cloud Foundry environment

SAP BTP, ABAP environment

SAP S/4HANA Cloud

SAP HANA Cloud SAP HANA service

On-premise ABAP

Source Control

git

Public

Modular, Tailored Dev Spaces

What kind of application do you want to create?

- ● SAP Fiori
- ○ SAP Cloud Business Application
- ○ SAP HANA Native Application
- ○ SAP Cloud Platform Mobile Services
- ○ Basic

SAP Fiori Dev Space

- IDE with language services for SAPUI5, JS, XML
- Layout editor and SAP Fiori tools
- Rich set of templates: SAP Fiori elements & freestyle
- Local test: multiple SAPUI5 versions, unit and integration tests, mock
- Env: CLI tools, SAPUI5 build, deploy to ABAP Repository, CF, …
- Service catalog
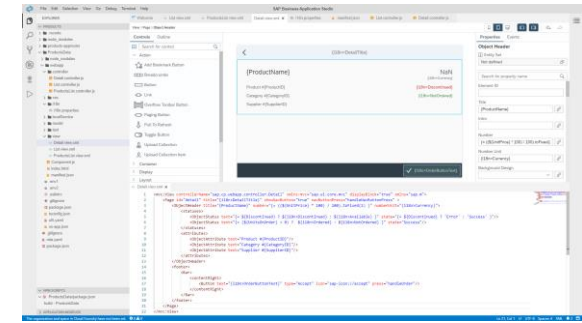
SAP Cloud Business Application Dev Space

- IDE with language services for Java, NodeJS, XML
- Layout editor and SAP Fiori tools *
- Rich set of templates: CAP, SAP Fiori elements* & freestyle
- Tools: CDS tools, MTA tools, Spring-Boot tools, SQL tools, REST client and SAP HANA tools*
- Local test: Run service, in-memory db, local SQLite db, REST client, mock, …
- Env: CLI tools, builders,….
- Service and Events* catalog
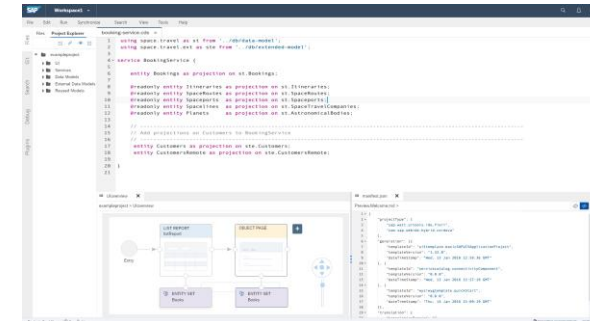
Mobile Dev Space

- Basic IDE with auto-completion, validation, and more
- Templates for: Mobile Dev Kit, Mobile Cards, Mobile Backend Tool
- Local test: Mobile runtime
- Env: CLI tools, deploy to Mobile Services
- Service catalog
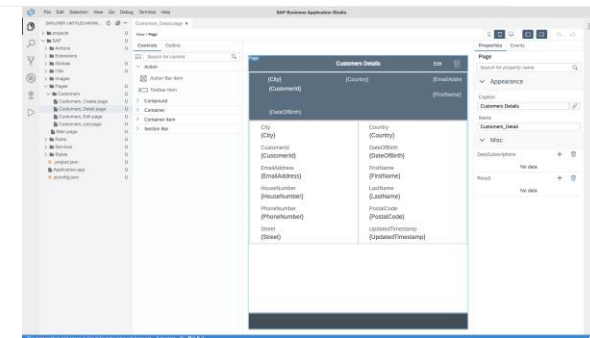
+ Create custom Dev Space templates for developers*

* Future Innovation

Public

This is the current state of planning and may be changed by SAP at any time.

SAP Business Application Studio vs. SAP Web IDE

	SAP Business Application Studio	SAP Web IDE Full Stack
Available on	SAP BTP, Cloud Foundry environment	SAP BTP, Neo environment
Deployment target	SAP BTP, Cloud Foundry environment, on premise ABAP SAP BTP, ABAP environment*	SAP BTP, Cloud Foundry environment, on-premise ABAP, SAP BTP, Neo environment
Solution	**Instantly spin-up pre-packaged isolated environments**/Dev-spaces ("virtual machine on the cloud") with tools and runtimes, tailored per business scenario which provide **more control over the environment and code Configure and share Dev-spaces***	Generic workspace that contains many tools. Some tools are not necessarily required for the target business scenario
Experience	**Embraces VS Code experience**, will provide the ability to add custom extensions* **Desktop like experience in the cloud** including local test, run & debug, terminal (CLI) access, and superior code editors	SAP proprietary experience Browser based experience
Support for various personas	**Better support for pro-code, cloud and full stack developers** with superior for Java and node.js coding Additional personas can be supported with a suited experience per persona using dev-spaces concept.	• Cloud and full stack developers – partial • Web/mobile developers • Similar experience for all personas
Open Source & standards	**Based on open source & leading industry standards** Provides possibility to **quickly integrate capabilities and technologies** that exist in the market*	Uses open sources but majority is proprietary SAP proprietary framework with limited number of extensions

* Future Innovation. This is the current state of planning and may be changed by SAP at any time.

# Visual Studio Code and SAP Business Application Studio

Visual Studio Code

- Provides development flexibility with **offline** capabilities

- Features a **developer-controlled**, highly configurable development environment

- Allows access to thousands of extensions from the Visual Studio Code marketplace

- Is part of a fast growing open source community
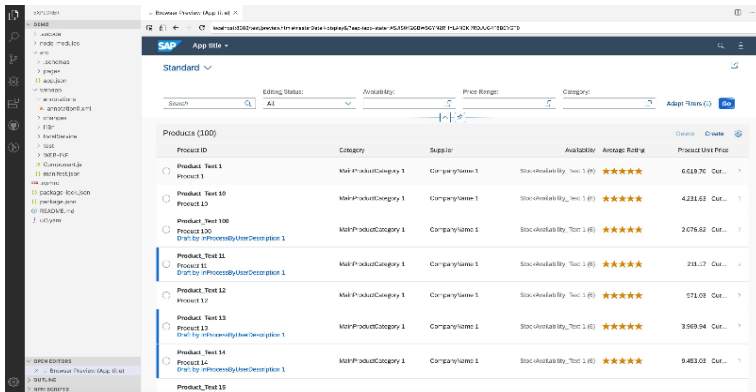
SAP Business Application Studio

- Provides a **managed**, preconfigured, **hosted environment**, optimized for SAP application development.

- Can be **centrally administrated** with tools repositories, systems access and company policies

- Integrates with existing SAP solutions, systems & services

- Easy access to Visual Studio Code-compatible extensions from open source Theia marketplace

Public
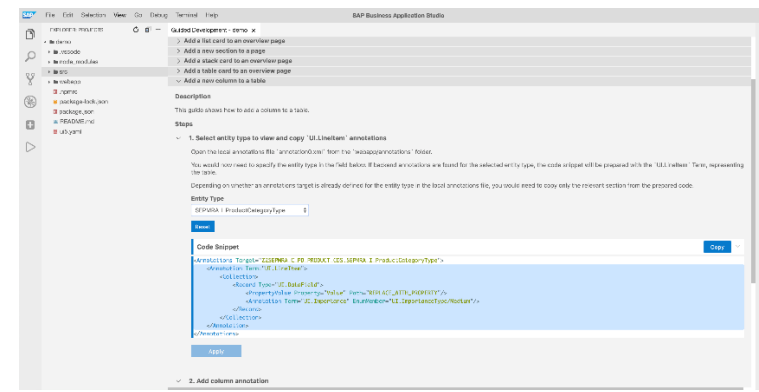
Quotes

Partner feedback

- *"Business Application Studio is the one which will change the existing trend I believe. It's really a Superb Experience for a Developer".*

- *"Business Application Studio gives me all the tools in one place without overhead of installation and maintenance."*

- *"I use web ide for development as of today and using Business Application Studio was fun as it is more about command lines and it is faster than web ide. So, I liked the deployment part quicker than web ide and it would help me a lot in future."*

- *"Overall experience was very good, since I am Fiori Application Developer and I use WEB IDE extensively, I liked Business application Studio better when compared to it."*

Pablo Marichal
@dotpablo

SAP Business Application Studio is the killer Web IDE for Eclipse, VS Studio et al. and faster than SAP Web IDE (obviously different domains, uses, etc)

Works great and super intuitive to developing apps wit SAP CAP Programming Model

03/05/2020, 22:36

Customer feedback

- *"Works way **faster** than the WEB IDE"*
- *"As a developer we've got **more control** now"*
- *"Testing is now much **easier**"*
- *"Nice, no longer the need for installing VS Code on local machines"*
- *"It is **like a local development** in the browser"*

Public

Thank you.

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THE BEST RUN **SAP**