Complex Solution Development in the Cloud

How SAP BTP supports implementation and operations of individual custom developments

Complex Solution Development in the Cloud

Content
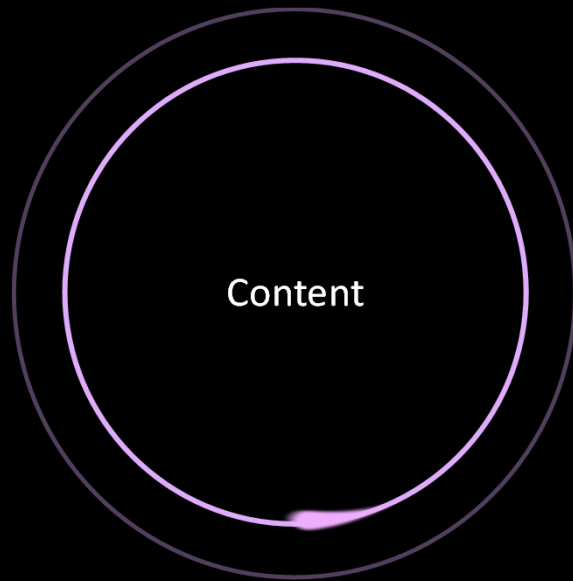
1 CI/CD as enabler of the Digital Solution Factory

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3 Sneak Peak of an Application from our Digital Solution Factory

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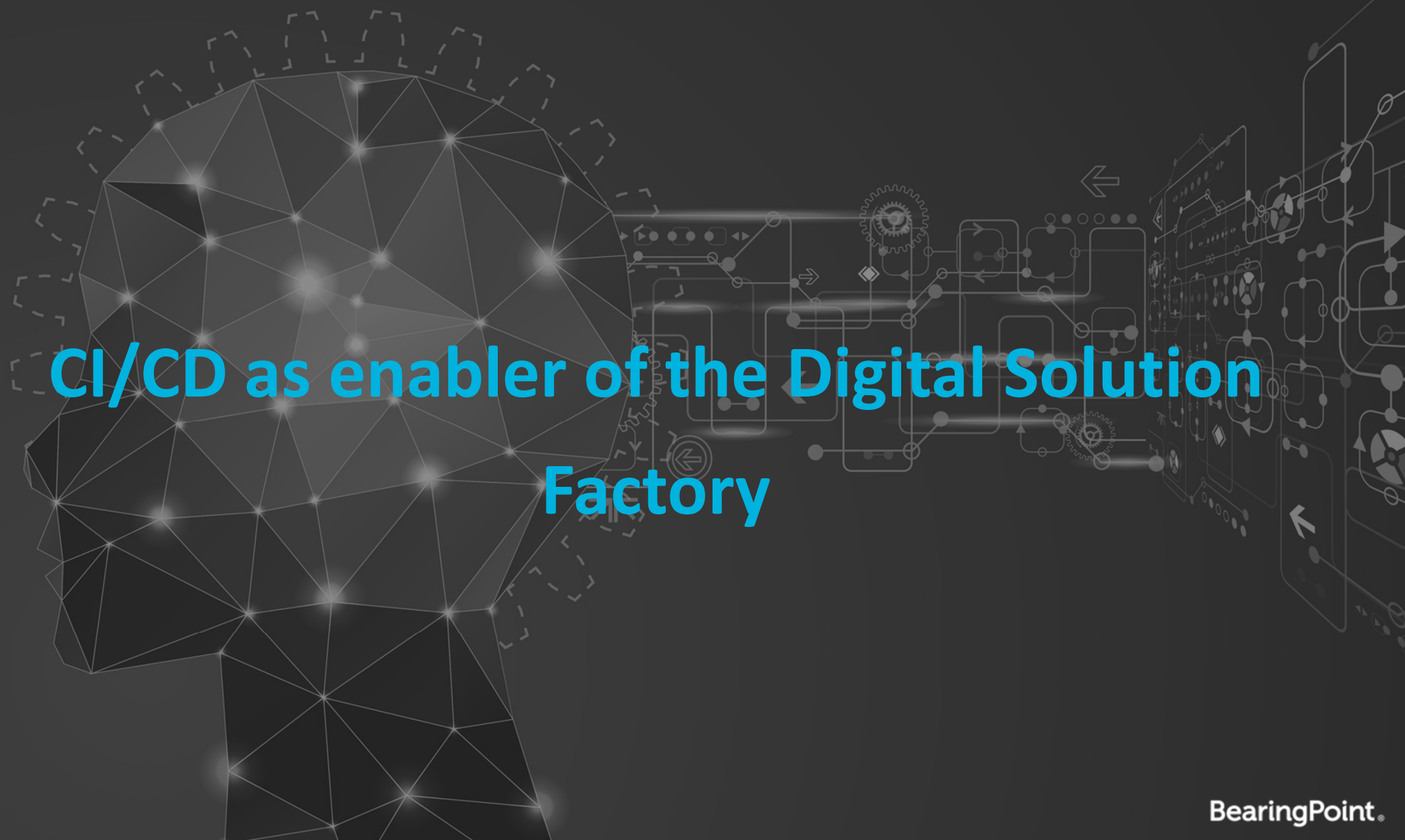
CI/CD as enabler of the Digital Solution Factory

Modern Software Development Concepts

Key aspects to consider for modern software development processes
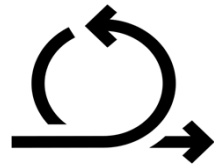
Agile

focuses on **processes**

highlighting **change**

while accelerating **delivery**

CI/CD

focuses on **software-defined life cycles**

highlighting **tools**

that emphasize **automation**

DevOps

focuses on **culture**

highlighting **roles**

that emphasize **responsiveness**

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Status Quo

How development is done today
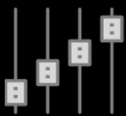
Changing Business Needs
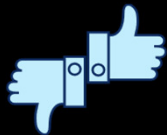
Absence of continuous Feedback

- Non standard development processes
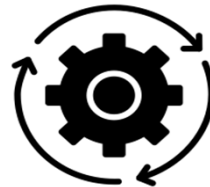- Non standard requirements engineering
- Individual operations processes
- Inventing the same thing twice
- Inconsistent user experience
- Issues in handover to operations
- Rampup and ramp down costs for development
- Many repositories

Disconnected Teams

- Missing continuous improvement processes
- Technological debts
- Security risks
- Cluster risks of know how accumulation
- Dependency on 3rd party suppliers
- Inconsistent integration scenarios
- Inconsistent data models
- Heterogenuous technology stacks
- Know how transfer between business and dev, dev and operations

High Costs

Time Constraints

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CI/CD in a nutshell

The typical process flow of CI/CD based developments

Team Planning
(Sprints, Epics, Userstories)

Coding

Sourcecode Repository

CI/CD Platform

Build Cloud

Binary Repository

Staging Cloud

Commit

OnCommit

Hook

Initiate

Build Slave

Release binaries

Deploy released binary code

.. on a VM

Deploy released binary code

Initiate Test environment

.. on a container

Fetch committed source code

test and monitor

plan	code	build	release	deploy	operate
JIRA Confluence	Java, Atlassian Bitbucket, git	zuul Jenkins, MESOS, docker	JFrog Artifactory, NEXUS	kubernetes, OPENSHIFT, openstack, aws	Azure

Digital Solution Factory

A digital Solution Factory provides business capabilities at a fraction of individual software development and operations cost

- Accommodate your individual business needs beyond out of the box solutions from major providers

- Innovative approach to a business problem or to gain competitive advantage faster

- Proven components tailored for your enterprises specific needs and knowledge

- Integrate directly in your system landscape instead of a loosely coupled solution from a third party

What?

Why?

When?
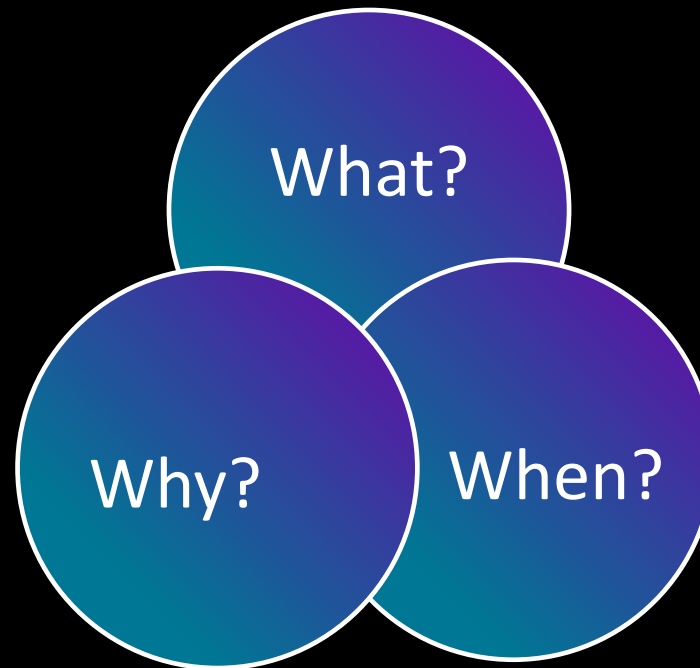
- Need of process add-ons or new process extensions that are not supported out of the box of your software providers

- Business requirements have changed and need an enhancement that is not supported directly by existing systems

- You want to reduce implementation and operations cost of your individual software

- Need an immediate solution to be directly integrated into your core systems

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Digital Solution Factory

How to get started

Pick

Try fast

Co-ideate

Scale

Run

Component Catalog

- You maintain user centric solutions for your typical business use cases
- Pick and chose the right pre-fabricated solution for your busines from the catalog

Plug and play

- Fast integration and deployment of the components directly into your enterprise environment
- Support agile and individual development lifecycle
- Use a jump-start for your development projects

Continuous innovation

- Enhance your business with the standardized support of your new capabilities
- Foster your innovation journey with your ideas

Expand

- Roll-out to your business
- Sustainable transformation across organization
- Delight your users through technologies ahead of the market

Updates, service and maintenance

- Constant updates
- Optional technical support
- Optional functional support

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Current Capabilities of the SAP BTP

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SAP Intelligent Enterprise

INDUSTRY CLOUD

Partner Solutions

SAP Solutions

BUSINESS NETWORK

BUSINESS PROCESS

Across all functions

EXPERIENCE MANAGEMENT

APPLICATIONS

INTELLIGENT SUITE

INDUSTRY CLOUD

SUSTAINABILITY MANAGEMENT

TECHNOLOGY

BUSINESS TECHNOLOGY PLATFORM

SAP Business Technology Platform – SAP BTP

Open runtime
Open API
Open Environment

Foundational
Services

SAP BUSINESS TECHNOLOGY PLATFORM

Cloud
On-Premise
Hybrid, edge

Any data store
connectivity

Database and Data Management	Analytics	Application Development and Integration	Intelligent Technologies

Database and Data Management

SAP HANA

SAP HANA Cloud

SAP Data Intelligence

SAP Master Data Governance

SAP Adaptive Server Enterprise

…

Analytics

SAP Analytics Cloud

SAP Data Warehouse cloud

SAP BusinessObjects BI

SAP Business Planning and Consolidation

SAP BW/4HANA

…

Application Development and Integration

SAP Integration Suite

SAP Extension Suite

SAP Process Orchestration

SAP Cloud ALM

SAP CI/CD service

…

Intelligent Technologies

SAP Intelligent Robotic Process Automation

SAP Conversational AI

SAP Internet of Things

SAP AI Business Services

SAP Ruum

…

SAP

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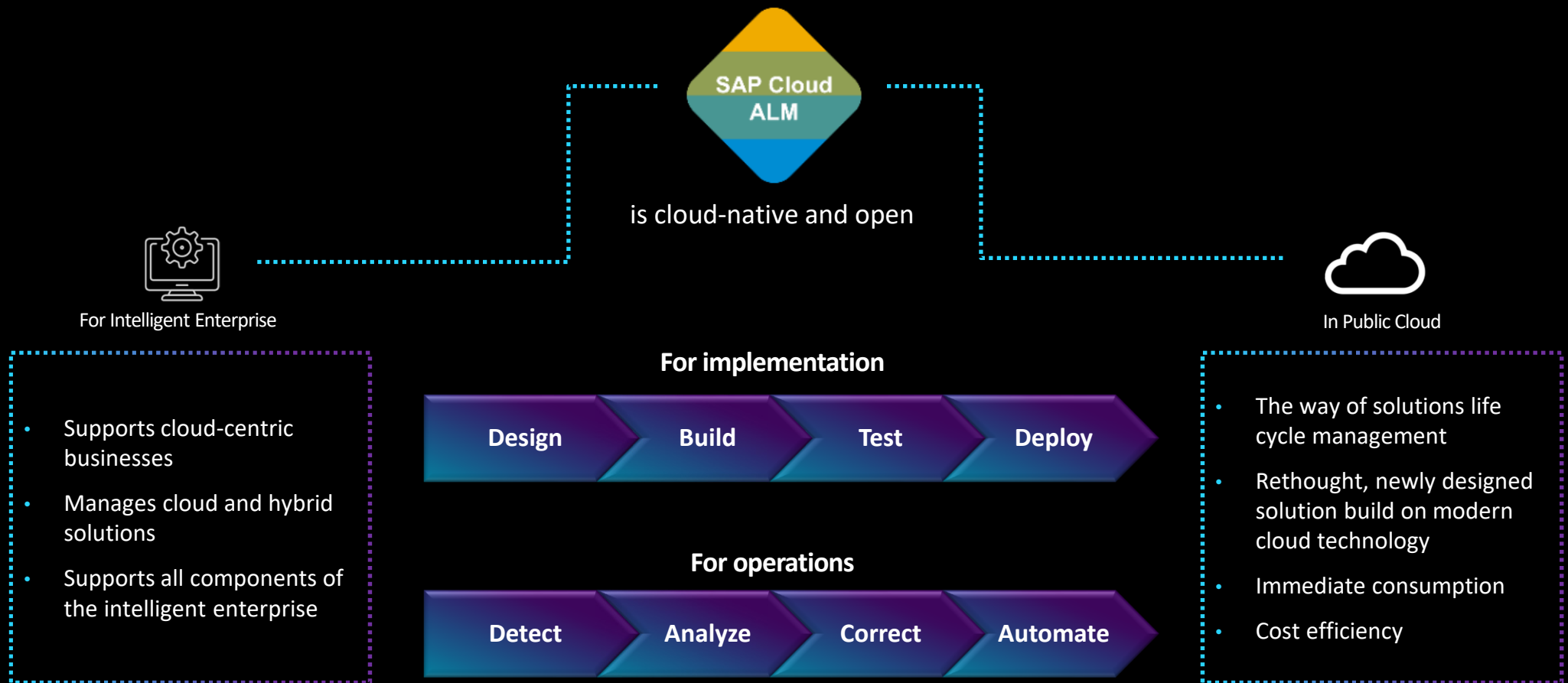# SAP BTP - Application Development and Integration

Extension Suite

. Simplified application development without disrupting core applications

. Access to APIs and events of SAP solutions such as Ariba, S/4HANA Cloud Edition, Success Factors

. Enterprise-grade framework and ready-to-use business services

. Low-code and multichannel experience development

➔ allows the adoption of agile development approaches, making it easier to manage the entire application lifecycle from development to deployment.

Integration Suite: SAP iPaaS

Comprehensive suite of capabilities to meet evolving integration needs

An API-first approach to building software across cloud and on-premise environments

Prepackaged, managed integration flows, business events, and APIs

Broad catalog of third-party integration packs and APIs

Intuitive Web tooling and artificial intelligence–driven integration

Enterprise-class governance, security, and scalability

SAP Cloud ALM as facilitator of your Change Lifecycle

SAP Cloud ALM

is cloud-native and open

For Intelligent Enterprise

In Public Cloud

For implementation

Design → Build → Test → Deploy

For operations

Detect → Analyze → Correct → Automate

- Supports cloud-centric businesses
- Manages cloud and hybrid solutions
- Supports all components of the intelligent enterprise

- The way of solutions life cycle management
- Rethought, newly designed solution build on modern cloud technology
- Immediate consumption
- Cost efficiency

SAP

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SAP Offerings for CI/CD based Application Development

SAP Continuous Integration and Delivery

- A service on SAP BTP

- Allows configuration and running of predefined continuous integration and delivery pipelines that test, build, and deploy code changes.

- Supports the development of SAP Cloud Application Programming Model (CAP) and SAPUI5/SAP Fiori applications.

„Project Piper"

- Open-source project

- provides preconfigured Jenkins pipelines: usable across own Jenkins infrastructure.

- It consists of two components:

- Shared Library: description of steps, scenarios, and utilities required to use Jenkins pipelines

- A set of Docker Images: can be used to implement best practice processes

Continuous Integration and Delivery Best Practices Guide

- Best practice procedures to implement continuous delivery pipelines on any CI/CD stack

- Application of CI/CD principles to SAP-specific technologies.

Flexibility

CI/CD Best Practices Guide

„Project Piper"

CI/CD Service

Required Expertise
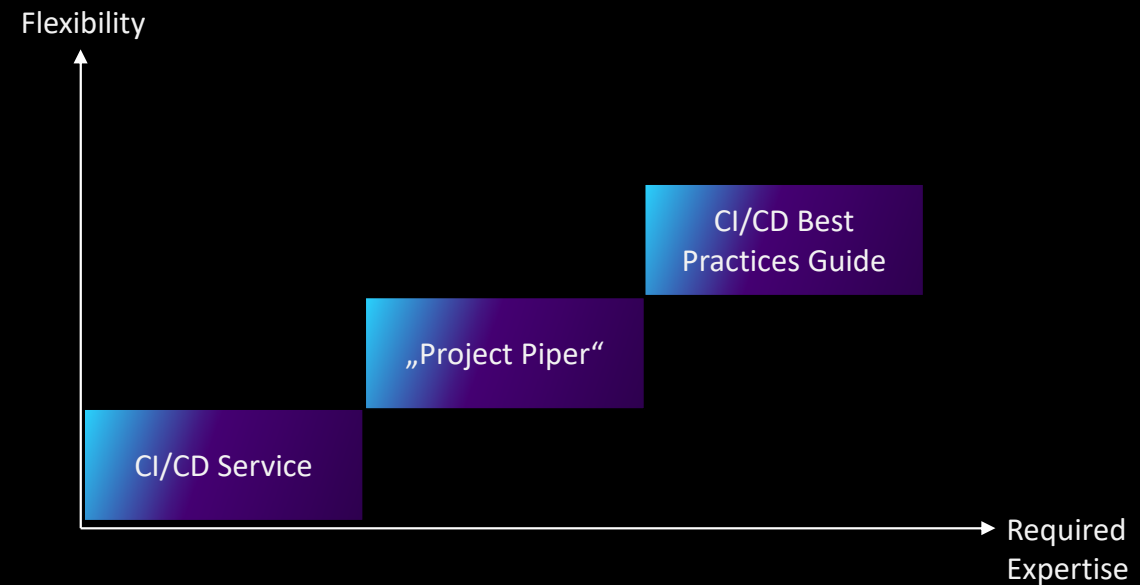
„Project Piper"

Plugin for CI/CD for ABAP.

Applicable to projects both for SAP BTP and SAP on-premise platforms

Available Artifacts:

- A set of ready-made Continuous Delivery pipelines for direct use
- **ABAP Environment Pipeline**
- **General Purpose Pipeline : merged with SAP Cloud SDK Pipeline**
- A shared library: contains reusable step implementations
  - → Enables customization of preconfigured pipelines
  - → build own customized pipelines
- A standalone command line utility for Linux and a GitHub Action
- A set of Docker images to setup a CI/CD environment in minutes using sophisticated life-cycle management
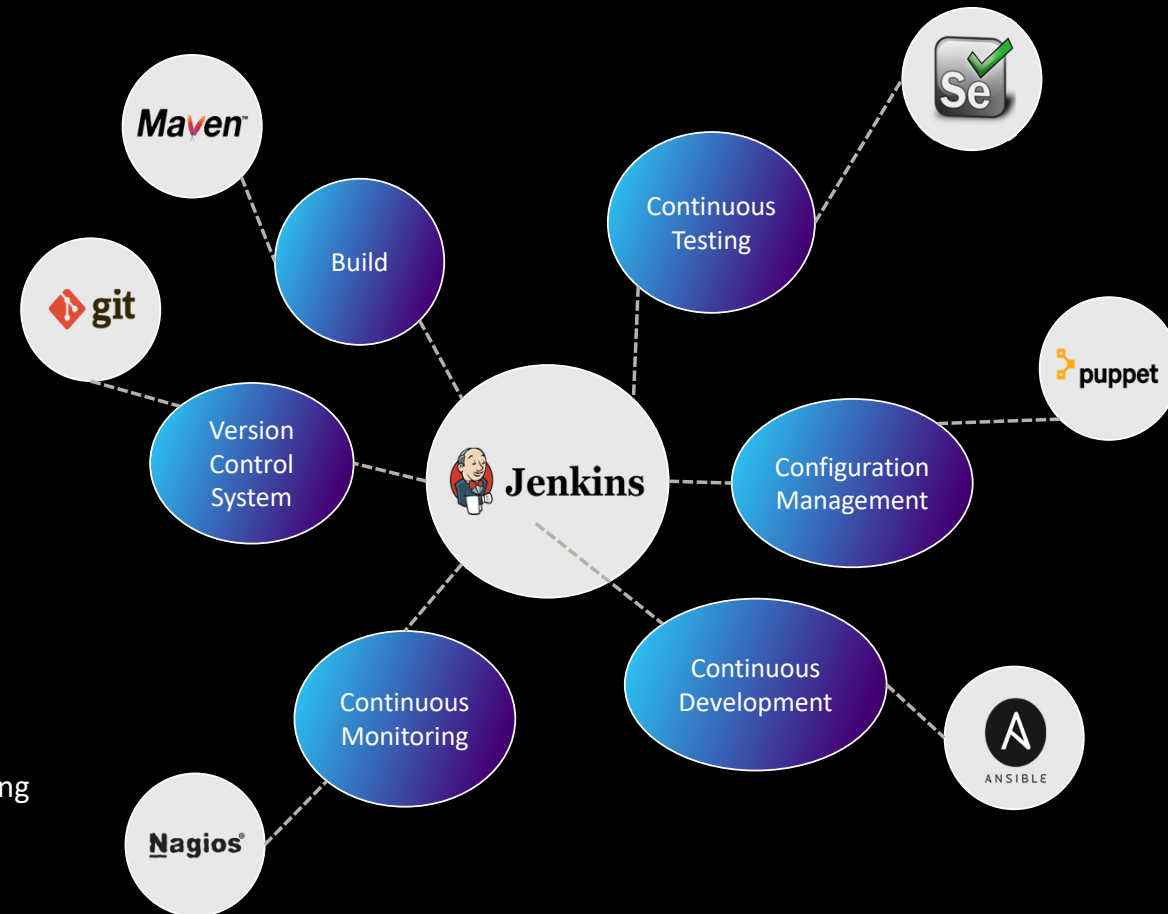
The Best Practice way ➔ Ready-made pipelines

The do-it-yourself way ➔ Build with Library - shared library contains building blocks

„Project Piper" for ABAP Development
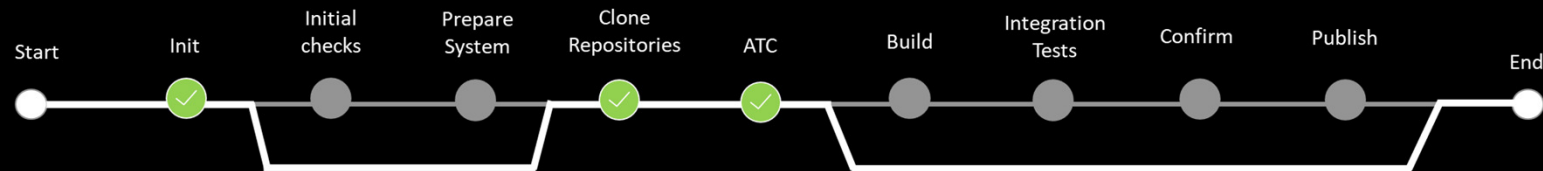
ABAP Environment Pipeline

Goal: enable Continuous Integration for the SAP BTP, ABAP environment (also known as Steampunk)

The pipeline contains several stages and supports different scenarios.➔ user can choose a subset of these stages, which fits their use case

Scenarios:

1. Continuous Testing :

- The development is done within repositories and "transported" via git-based approaches

- Three relevant stages: "Prepare System", "Clone Repositories" and "ATC"

Start	Init	Initial checks	Prepare System	Clone Repositories	ATC	Build	Integration Tests	Confirm	Publish	End

2. Building ABAP Add-ons for Steampunk

- Intended for customers who want to provide a Software as a Service (SaaS) solution on the SAP BTP using the ABAP Environment.

- Different steps responsible for a single task. The steps themselves are grouped semantically into different stages

Start	Init	Initial checks	Prepare System	Clone Repositories	ATC	Build	Integration Tests	Confirm	Publish	End
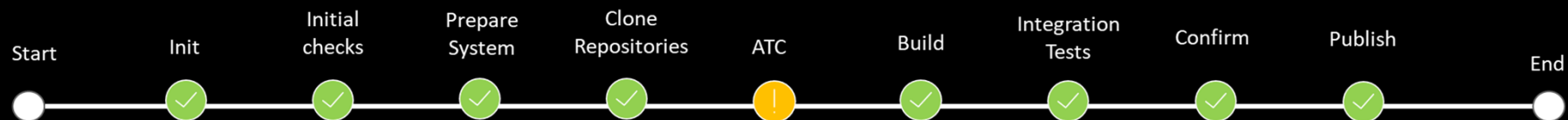
Sneak Peak of an Application from our Digital Solution Factory

ETM.next as part of the SAP EC&O industry cloud offering

Supporting end-to-end processes in an intelligent and modular fashion while embedded into the overall value chain
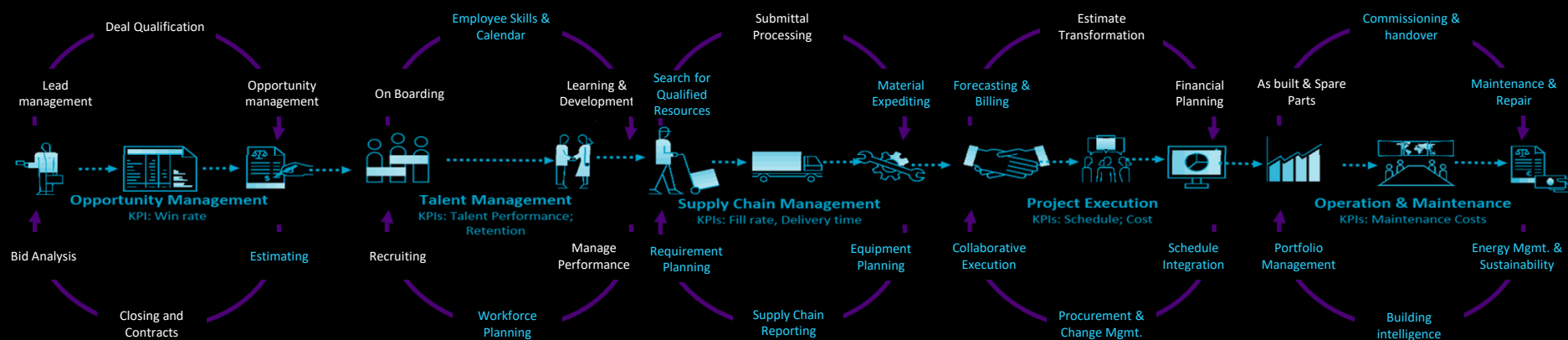

Integral part of industry cloud offering for EC&O
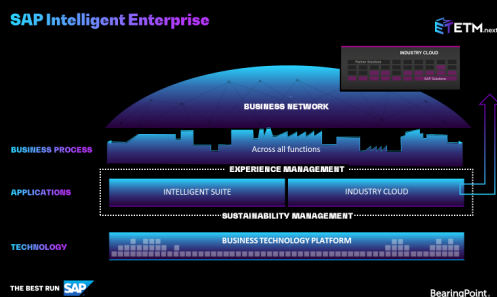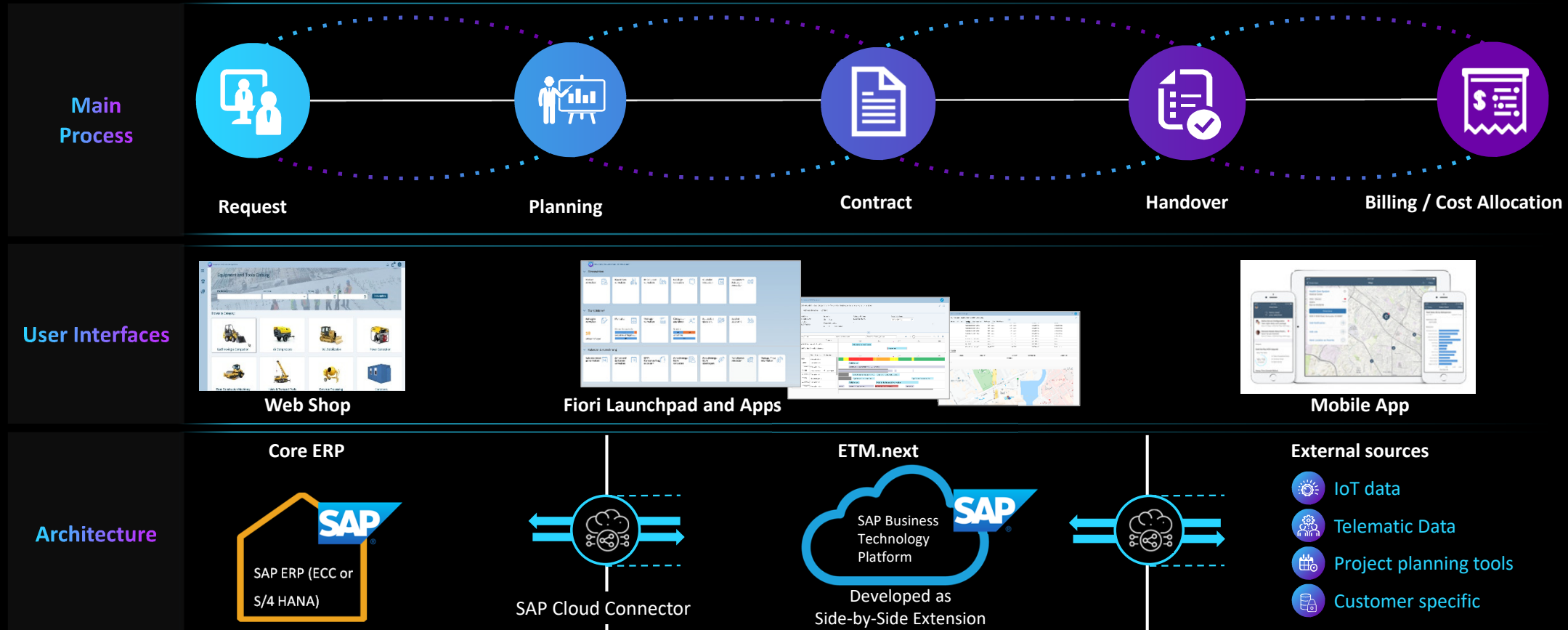
Award Winning

Available on SAP Store

Colored Processes are supported by ETM.next Functionalities

High Level Process, User Interfaces & Architecture Overview

ETM.next

Main Process

Request — Planning — Contract — Handover — Billing / Cost Allocation

User Interfaces

Web Shop — Fiori Launchpad and Apps — Mobile App

Architecture

Core ERP

SAP ERP (ECC or S/4 HANA)

SAP Cloud Connector

ETM.next

SAP Business Technology Platform

Developed as Side-by-Side Extension

External sources
- IoT data
- Telematic Data
- Project planning tools
- Customer specific

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Major benefits of ETM.next – What's in ?

ETM.next

Finance & Controlling
Digitization & IT

- **Cost Reduction by:**

| Increased Utilization | Process Digitalization | Process Efficiency | Less idle-times & losses |

- **Process improvements by:**

| Billing Simulations | Reporting & Analytics | Deep ERP integration | Intra- & Intercompany |

- **Digitization by:**

| Mobile App | Asset Identification (Scanning) | Photo Documentation |
| Electronic Signature | Telematic Integration (PORR Black Boxes) | Asset Track & Trace |

- **Future-proven for IT:**

| Industry Cloud Application | Side-by-side extension to ERP | Long-term commitment |

Business & Operations:
Equipment-as-a-Service

- **Fleet Management:**

| IoT & Telematics | Stock Overview | ERP Integration | KPI Controlling |

- **Yard Management**

| Inspections, Safety & Compliance | Warehouse Management | Multiple Storage Locations |

- **Site Management:**

| Cost Transparency | Local Warehousing | Theft Protection |

- **Planning & Disposition:**

| Improved Planning Board | Accuracy on Availability | Reservation Process |

- **Project Management & Commercials:**

| Contract with all data | Revenue Transparency | Billing Simulations | Procurement Support |

ETM.next

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Our lessons learned from setting up our own Digital Solution Factory

- Invest in actively into training your teams

  - Build a Community of Communities and foster communication and knowledge transfer

- Standardize Workplaces (standard tools, standard processes, standard reporting)

  - Reduce Support and Ramp-up, Ramp-down efforts, as well as flexibility on task assignment

- Chose the right toolset for the purpose (i.e.: web ide vs. BAS vs. VSCode) and review frequently

  - Web IDE fullstack ist the only one supporting graphical calculation views
    VSCode is very famous with the Open-Source community

  - Use the CAP framework

- Centralize

  - Toolset, Repository, Standards & Guidelines

  - Landscape Operations

  - Cloud Provisioning

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Q&A

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Thank you.

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