



SAP Data Intelligence in the BTP Innovation Ecosystem

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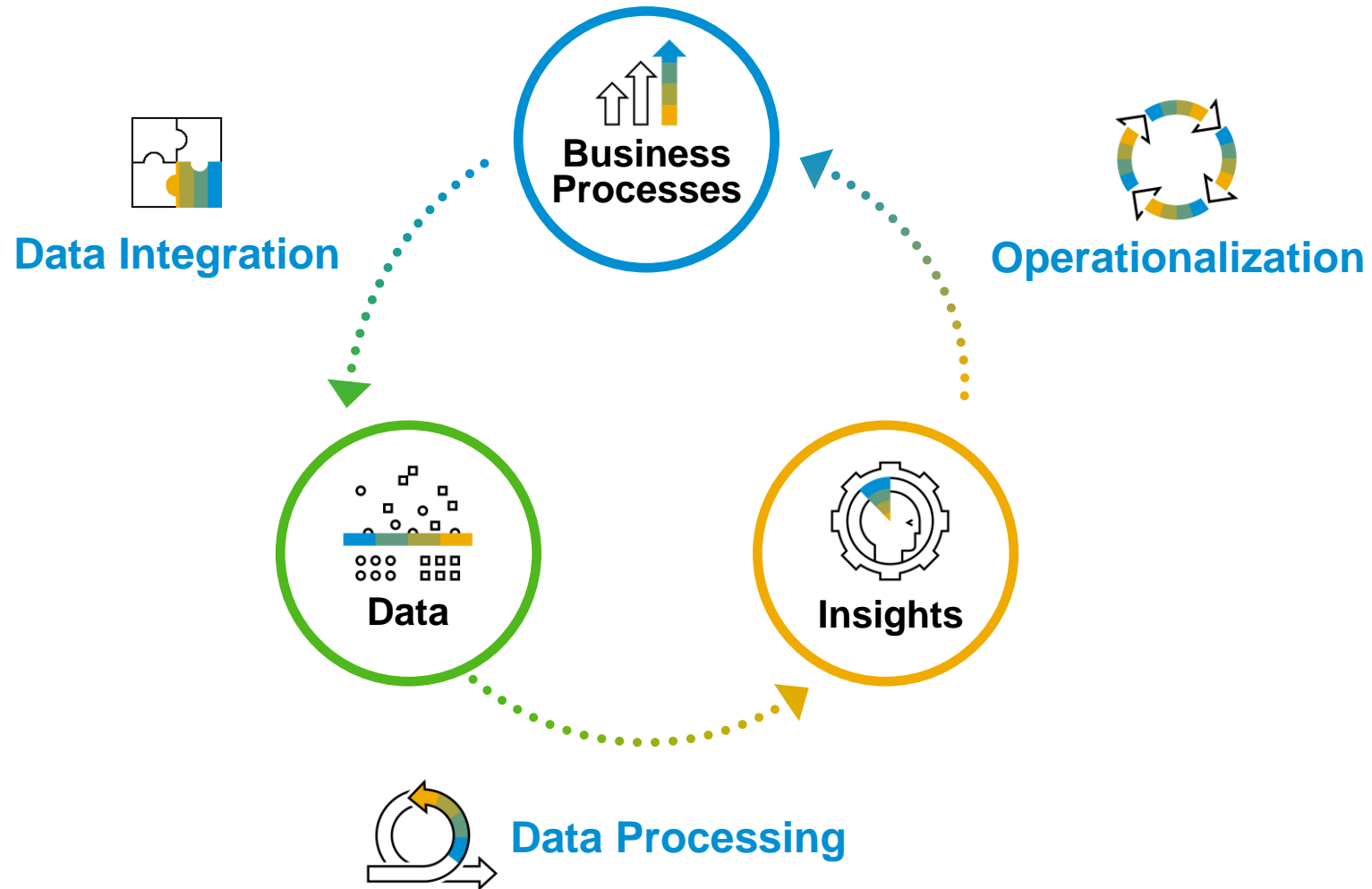
Agenda


- Product overview
- Product strategy update
- Customer use case
- Recent innovations
- Upcoming innovations and roadmap
- Q&A

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Data Management is the key for **Business Process** improvement





**Data is heading to the
cloud. Are you ready?**

>80%

**indicated their intent to
use or were already
using cloud for
data management***



Data is growing more diverse and distributed. **Can you harness the value of all your data with confidence?**

71%

Struggle to connect
big data to enterprise
data and business
processes¹

¹ Forrester Consulting, [2019 Hybrid Data Management Drives Innovation and Growth](#)

Why is Data Management so difficult?

Enterprise IT is challenged to a whole new degree!



Integration

“I need to join my sensor data with some image bitmap and with the related master data”



Processing

“I’m clustering the data in Python to feed a predictive model in HANA”



Discovery

“What is this data and what does it mean?”



Quality

“Can I rely on this data to drive decisions in a critical process? How was it gathered?”



Compliance

“Where am I storing personal identity information of German citizens?”



Operations

“My data and engines are spread between my on premise data centre and my hyperscaler cloud”

Why is Data Management so difficult?

Enterprise IT is challenged to a whole new degree!



Integration

- Structured, unstructured, streaming
- Batch, (near) real-time
- Transactional, Analytical, Hybrid



Processing

- Several heterogeneous engines
- Diverse processing patterns (offline, lambda, event-driven ...)



Discovery

- Discover the available data sets, and find out their semantics



Quality

- Data inconsistencies and fragmentation
- Biased data sets
- ML model life cycle



Compliance

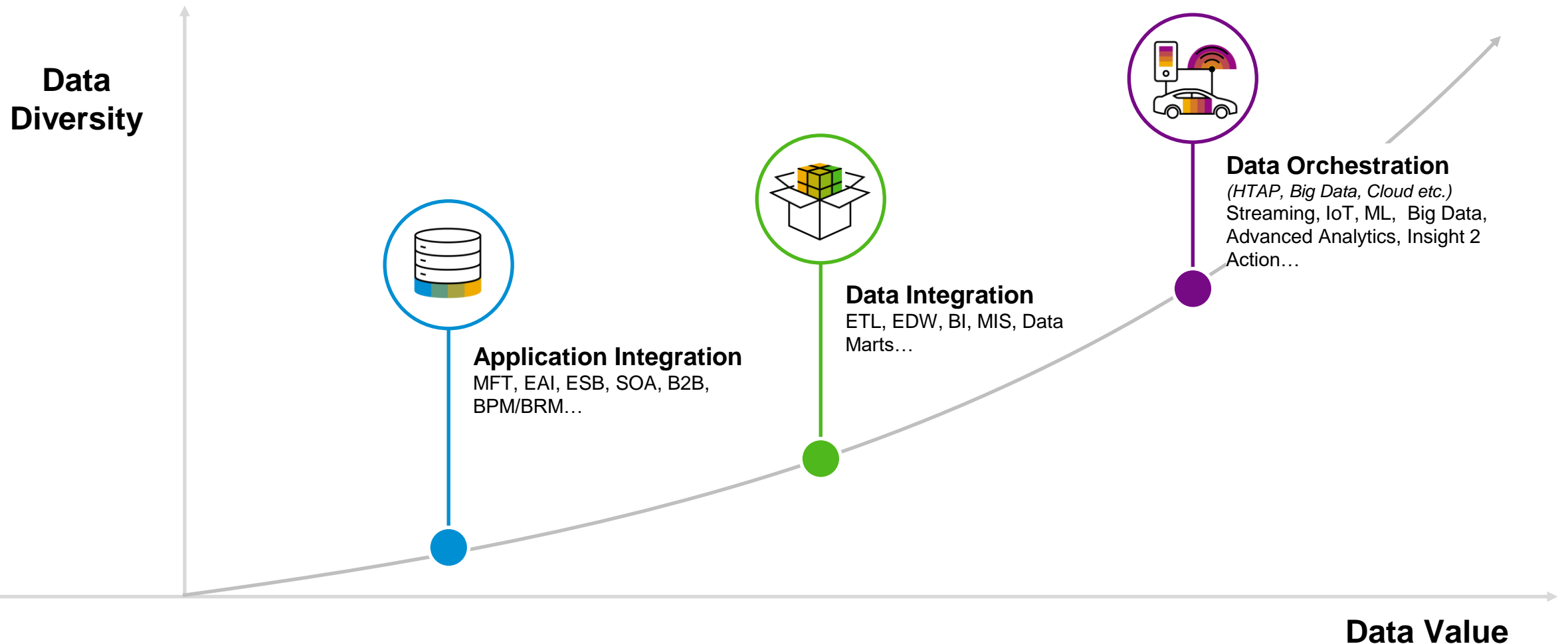
- Data privacy and protection
- Data lineage and auditing



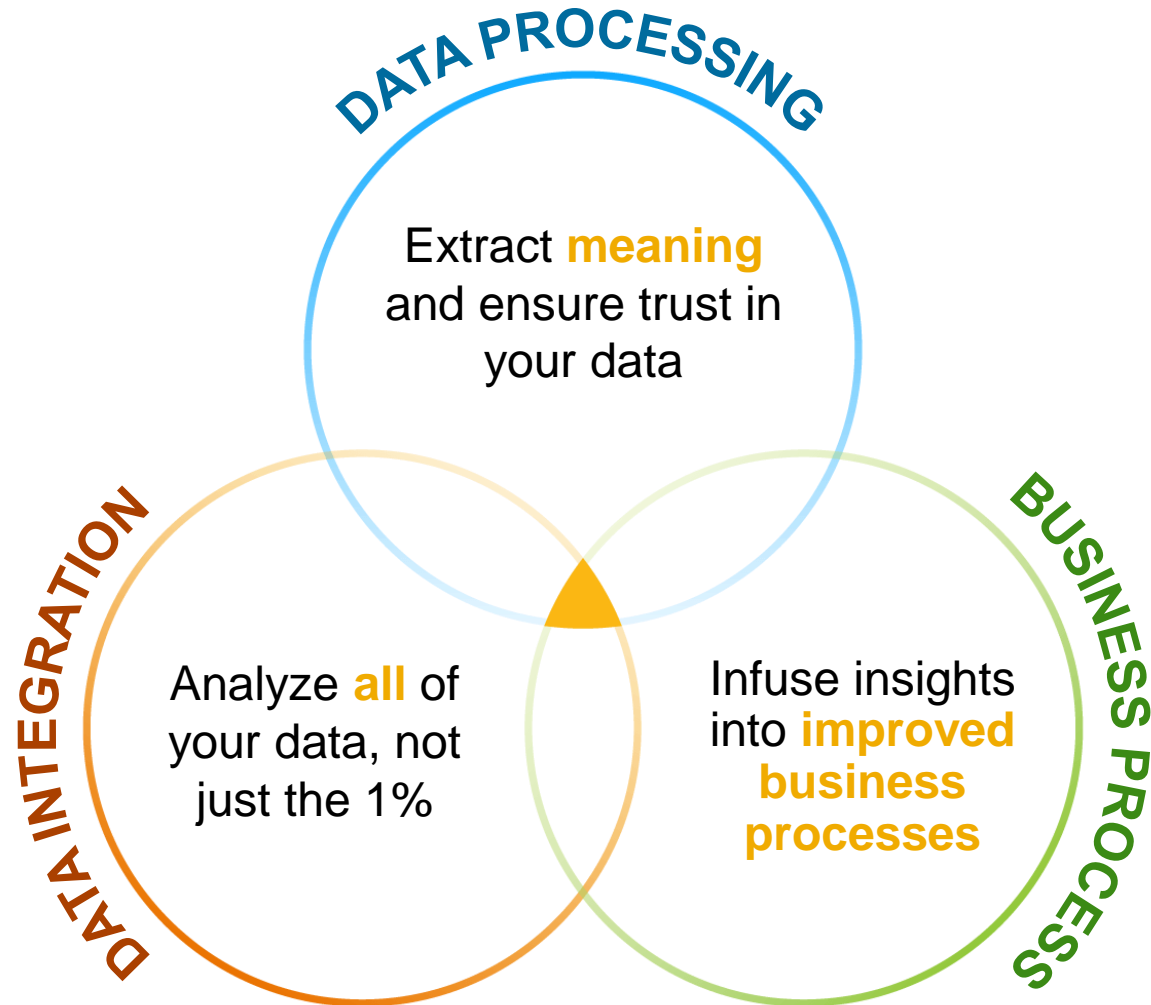
Operations

- Distributed landscapes, cloud and on-prem
- Elastic scaling
- Monitoring

Modern Data Management needs **Data Orchestration**, beyond data integration

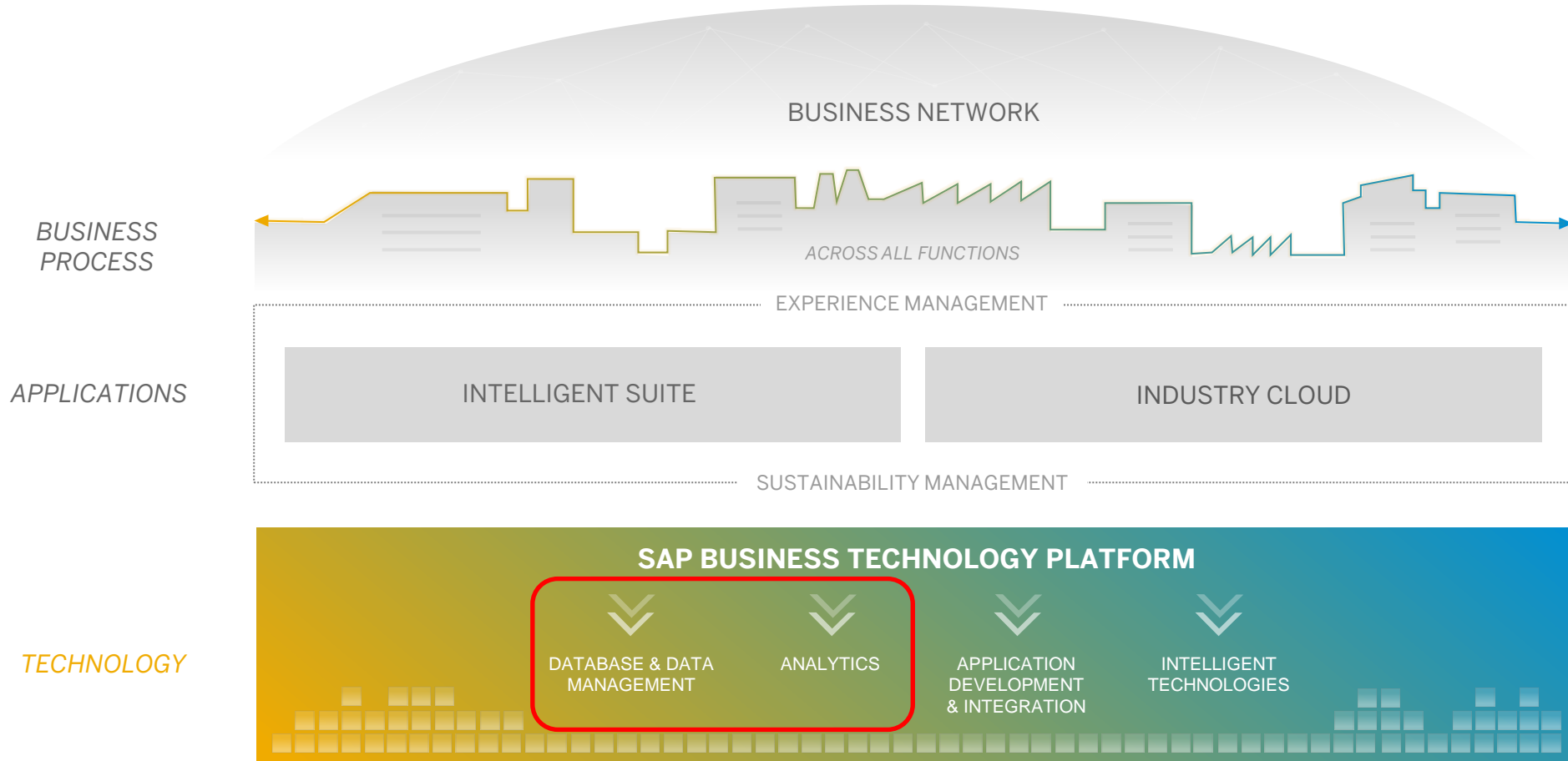


SAP Data Intelligence – From Data Integration to **Data Orchestration**



SAP Business Technology Platform

The Platform for the Intelligent Enterprise



SAP Data Intelligence – Core Capabilities



SAP Data Intelligence



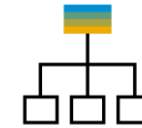
Data Integration

Connect and integrate everything, structured, unstructured or streaming



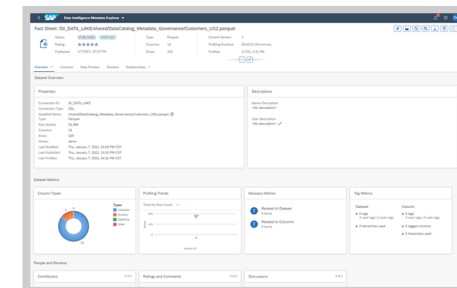
Data Processing

Extract meaning from data, orchestrating any mix of engines



Data Catalog

Discover, classify, profile, understand and prepare all your enterprise data assets



SAP Data Intelligence – Data Integration

Data pipelines integrate disparate data across distributed infrastructures



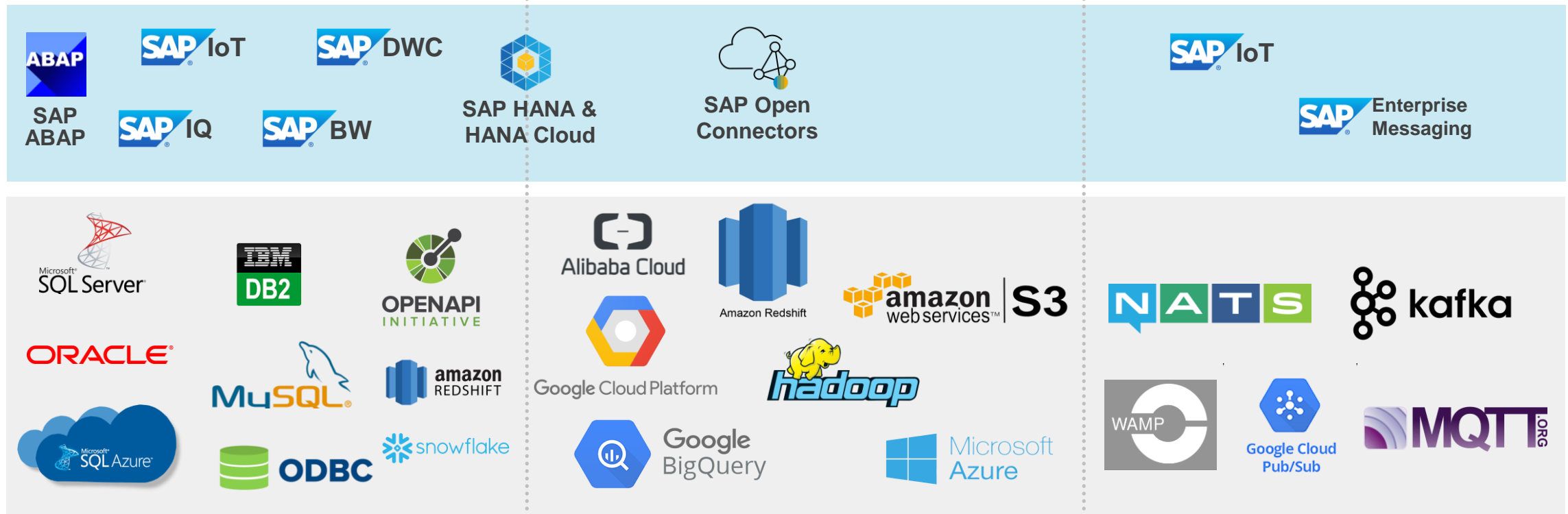
Structured Data



Unstructured Data



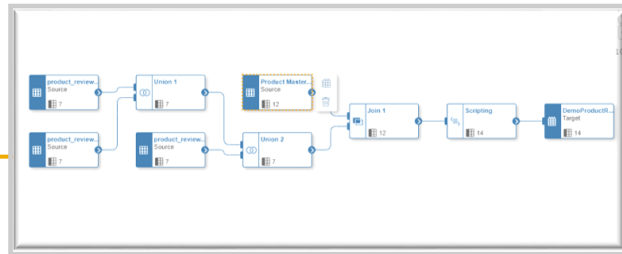
Streaming Data



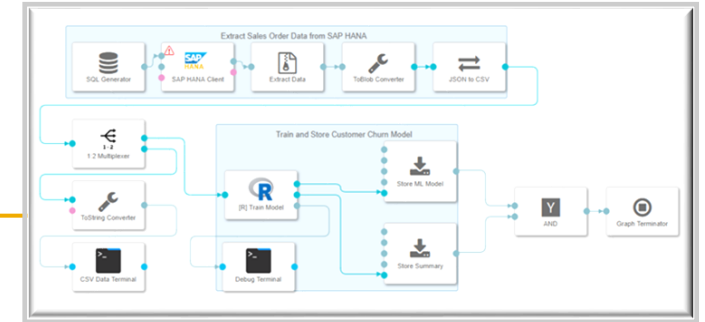
SAP Data Intelligence – Data Processing

Orchestrate any SAP and non-SAP engine, for any user

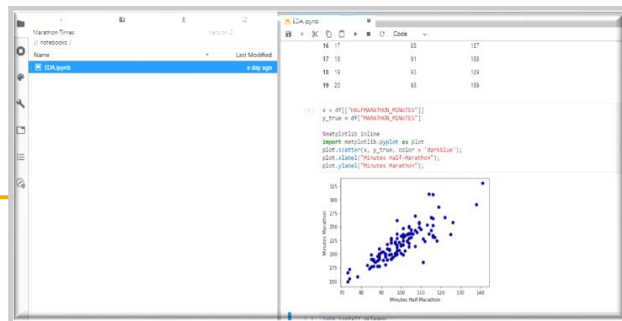
No-code embedded data integration for citizen users



Full-blown **low-code** pipelines for data engineers



Data exploration and notebooks for data scientists



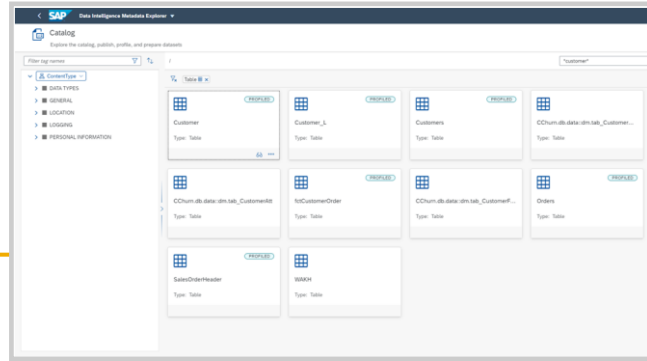
Across any mix of **open source**, **SAP** and 3rd party engines



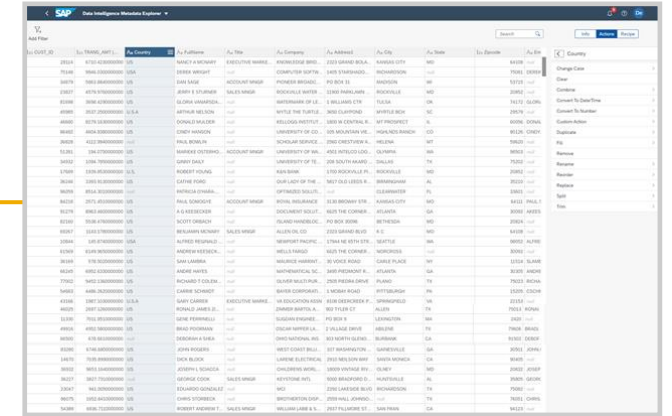
SAP Data Intelligence – Data Catalog

A centralized Data Catalog for your enterprise data governance

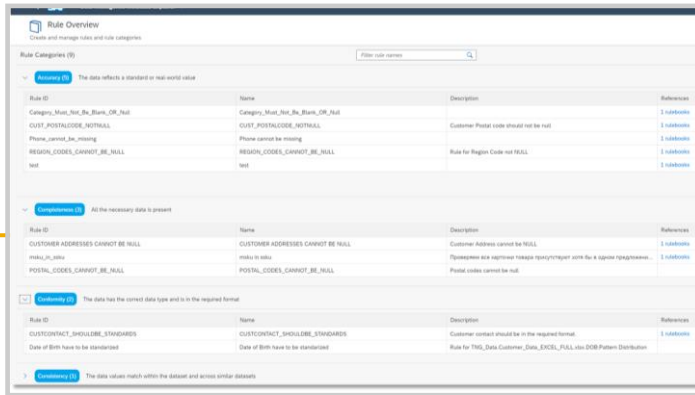
Data discovery, browsing and profiling



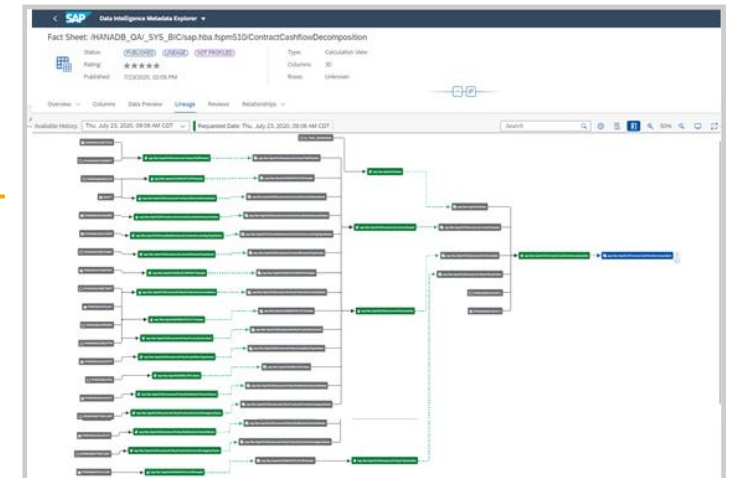
Self-service Data Preparation



Data quality rules and scorecards



Data lineage



SAP Data Intelligence – A rapidly growing customer base



[BTS Story - SAP Innovation Award 2020](#)
[TechEd 2019 session](#)



[BTS Story - SAP Innovation Award 2020](#)
[Video](#)



[BTS Story - SAP Innovation Award 2020](#)
[Video](#)



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[SAP Innovation Award 2020](#)



[Reference - SAP Innovation Award 2019](#)
[Video](#)

SAP Ranked as a Leader

The Forrester Wave™: Enterprise Data Fabric, Q2 2020

Figure 1: Forrester Wave™: Enterprise Data Fabric, Q2 2020



SAP was recognized as a **leader** in the Q2 2020 Enterprise Data Fabric Wave™ by Forrester based on its scores in the **current offering, strategy and market presence** categories.

According to the report: “SAP enhances data management capabilities to support complex use cases.”

SAP earned **5/5 scores for 14** criteria including:

- Data Pipeline
- Data Discovery
- Data Security
- Data Processing/Persistence
- Data Transformation
- Data Quality
- Data Integration
- Data Access and Search
- Data Fabric Deployment
- Use Cases
- Roadmap
- Professional Services and Support
- Revenue
- Customer Base

Market presence*
• • • • •
[Full Report](#) / [Newsbyte](#) / [Blog](#)



[The Forrester Wave™: Enterprise Data Fabric, Q2 2020](#), Noel Yuhanna with Gene Leganza, Robert Perdoni, Christine Turley, 10 June 2020

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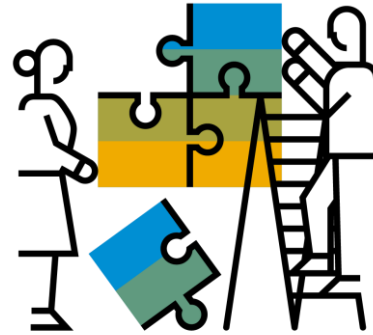
SAP Data Management portfolio – Strategy Pillars



SAP BTP

Pre-built integration

Seamless experience



Unification

Technically

Commercially



Hybrid

On-Premise

Cloud

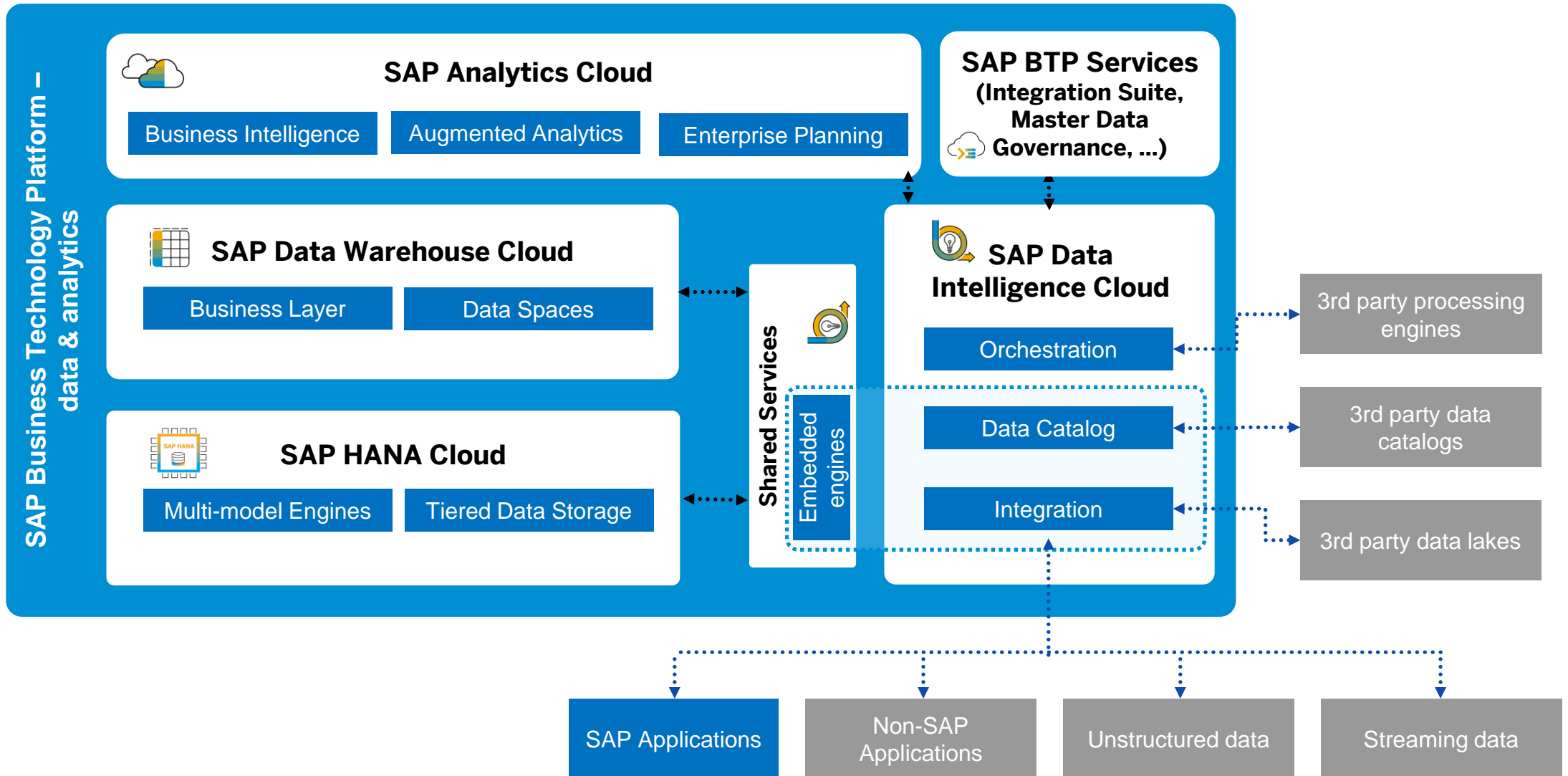
Multi-Cloud



SAP BTP

Our strategic vision: SAP BTP data & analytics solutions

Enabling an end-to-end data fabric to drive business outcomes





SAP BTP

Data Flow and Data Intelligence – Feature comparison



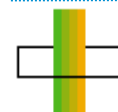
Data Flow in Data Warehouse Cloud

Simplicity and Ease of Use

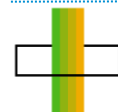
User Persona: Business Users / Analysts



Included for free within **DWC**, with **simplified resource control**



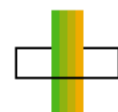
Support **data ingest** from supported sources **into DWC**



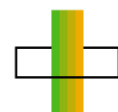
Simplified no-code UI for citizen users, powered by the same technology as Data Intelligence Cloud



Manage **structured** data and **text-based unstructured** data



Support for **relational data transforms** (union, join, merge, project) and simple Python scripting (NumPy and Pandas)



Predefined selective features, predefined quality rules, DWC data catalog for immediate ease of use



Data Intelligence Cloud

Flexibility and Power

User Persona: Data Engineers / Data Scientists / Developers



Separate service, integrated ootb with DWC, with **fine-grained resource control** and **autoscaling**



Flexible support for **any-to-any integration scenario**, including **data distribution out of DWC**



Full-blown low-code UI to leverage the whole functionality of the underlying pipeline engine



Flexible support for **any kind of structured, unstructured or streaming** data



Flexible support for **any kind of data transform and data processing** (any **Python, R, NodeJS, Go**), ML and **orchestration of external processing engines**



Full-blown enterprise **data catalog, metadata management, agile data preparation features; flexible data quality rules** across any data source



Our strategic vision: **Unification of Capabilities**

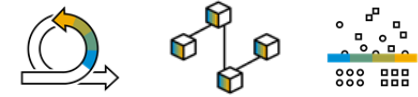
DATA INTEGRATION



DATA CATALOG



DATA PROCESSING



SAP LT Replication Server
On-prem

SAP Information Steward
On-prem

SAP HANA Smart Data Integration
On-prem

SAP HANA Agile Data Preparation
On-prem

SAP Data Services
On-prem

SAP HANA Smart Data Quality
On-prem

SAP Data Intelligence

Cloud, on-prem and hybrid

Our strategic vision: **Hybrid Data Management** Transition to **Cloud Data Management** at your own pace



End-to-end data fabric across **hybrid landscapes**



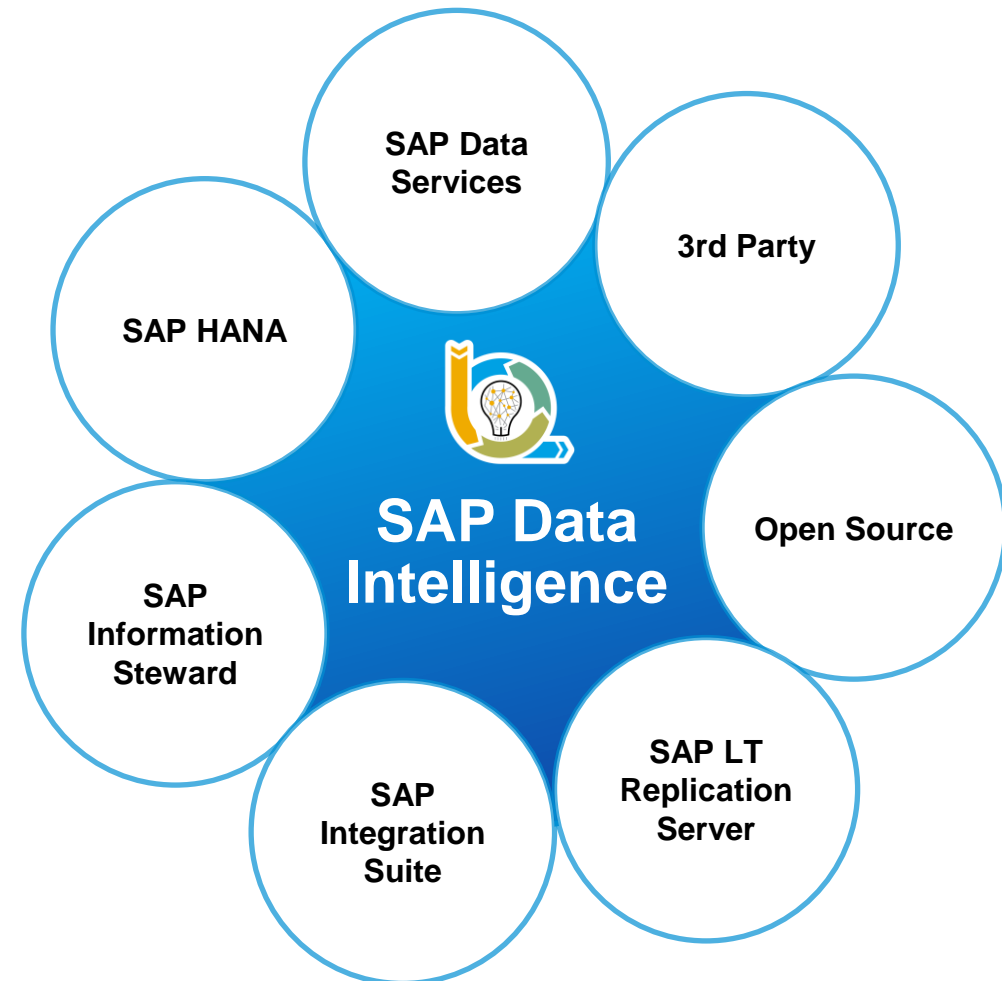
Safeguard past investments by reusing existing assets



Modernize landscape without disruption

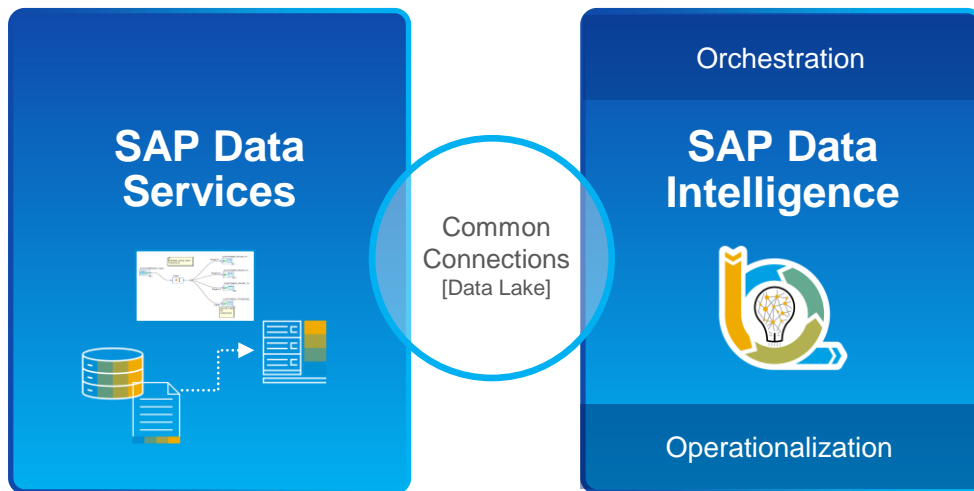


Cloud elasticity & **agility**

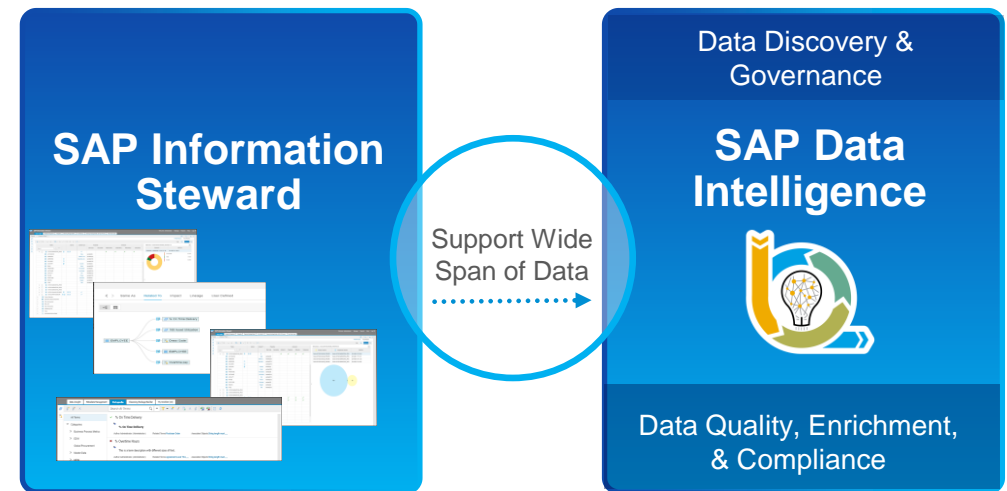


SAP Data Intelligence enabling Hybrid Data Management

Leverage existing SAP EIM tools



- Extend reach of Data Services assets across diverse system landscapes
- Orchestrate Data Services jobs within Data Intelligence pipelines (direct data exchange planned in DI 2107*)
- Enhance enterprise business processes with high value data and insights from external systems



- Reuse Information Steward rules within Data Intelligence
- Shared glossary of terms
- Metadata shared across applications, augmented by ML learning models, planned in roadmap*

SAP Data Intelligence Cloud and SAP Data Intelligence on-prem

DI Cloud service in SAP BTP is our strategic focus



- Any data integration and data orchestration use case
- Quick and simple adoption, thanks to fully managed service
- High pace of innovation (quarterly releases*)
- Integration within BTP Unified Data & Analytics will be further tightened, with dedicated cloud-only features*



- Niche big data oriented use cases, that strictly require on-prem and cannot be covered by DS/IS
- Complex adoption, due to K8s requirement
- Slower pace of innovation (yearly releases*)
- New features developed in DI cloud will not always be backported to DI on-prem*



Our strategic vision: Hybrid Enterprise Data Catalogs

Federation and metadata exchange, to avoid rip and replace



In large enterprises a **single catalog** is not realistic



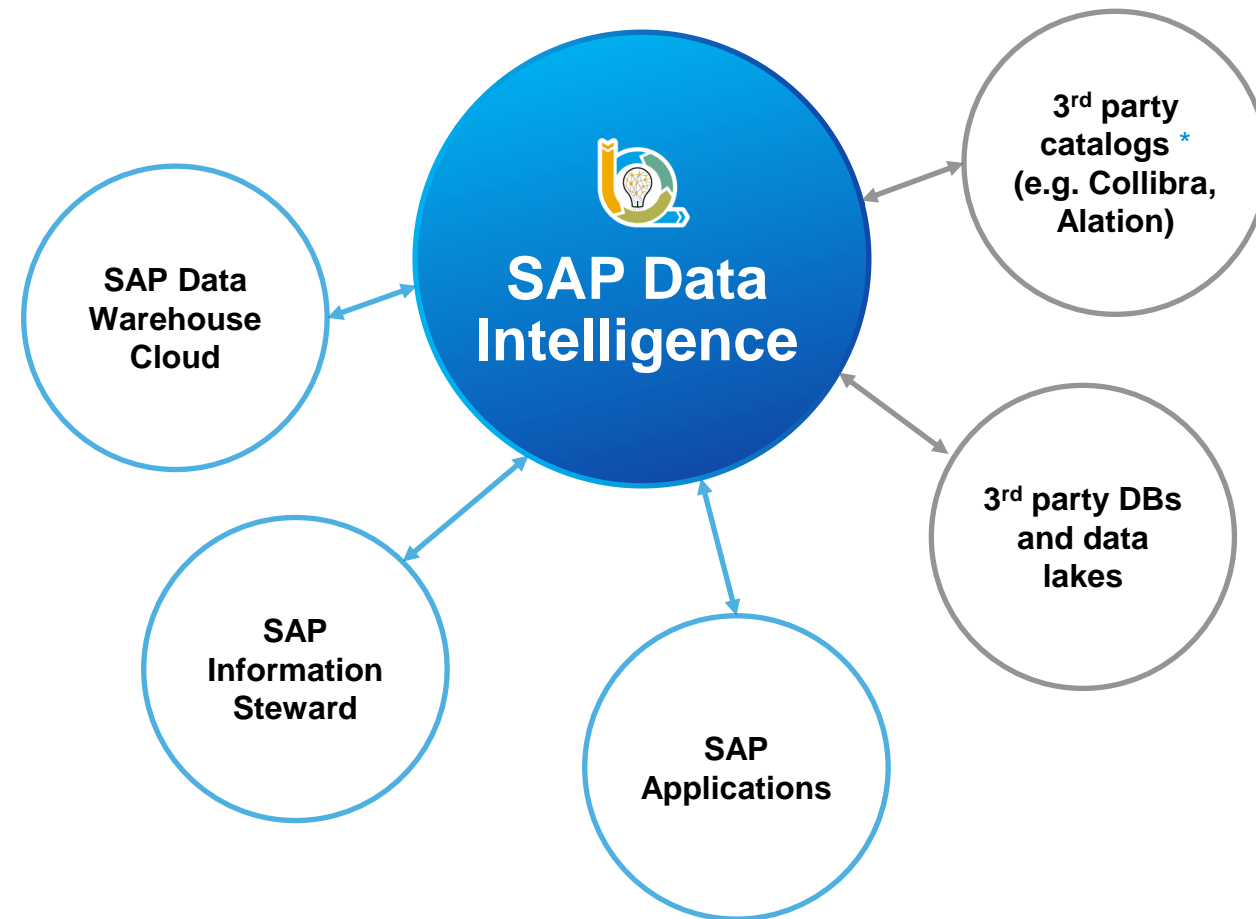
Metadata is spread among **multiple physical catalogs**



Data objects and **business terms** are managed in heterogeneous systems



Federation is key



*planned

Augmented Catalog with SAP Data Mapping and Protection by BigID

ML-driven data classification enabling privacy-aware data integration

Intelligent Business Processes



Prescriptive Analytics



SAP's intelligent data orchestration and governance

SAP Data Intelligence



Data Pipelining

Data Orchestration

Data Preparation

Hybrid & Containerized

Model Lifecycle

Data Anonymization

Data Lineage

Data Profiling

Data Catalog

SAP Data Mapping and Protection by BigID



Data Classification

Duplicate/similar data detection

PII & Entity Correlation

SAP Tools

Data Services
Information Steward
BW
SLT
PowerDesigner

SAP Applications

ECC S/4 HANA
SAP Cloud Applications

Non-SAP Applications



Open Connectors

Relational databases



Data lakes and Data Warehouses



IoT streams



Kafka
MQTT
[...]

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Predictive quality

Use Case: **IoT Ingestion & Orchestration**

Industry: **Manufacturing**



Business Scenario

- A major automotive company is seeking to improve the quality management process in a car component manufacturing plant
- Metal parts needed for end product assembly are produced by means of heat metal forming
- Defective parts need to be sorted out and melted
- Initiative to improve accuracy of quality checks and lower production cost

Challenge

- Failed parts can only be selected after a full batch has been processed; potential of entire batches being defective
- Not enough insights to adjust production settings early in the overall process

Solution

- Detailed analysis of data from sensors and infrared cameras
- Integration of that data with logistics data from ERP
- Execution of statistical algorithms to calculate quality KPIs

Predictive quality

Use Case: **IoT Ingestion & Orchestration**

Industry: **Manufacturing**



What SAP Data Intelligence Offers

- Consumption and processing of image data from Hadoop
- Calculation of quality parameters, describing local and global heat distributions
- Integration of sensor and enterprise data (supplier information)



Value of SAP Data Intelligence

- Pre-delivered operators for data ingestion and image processing
- End-to-end data flow modeling, execution, monitoring, and management in a single environment
- Out-of-the-box integration with SAP HANA for enterprise data integration



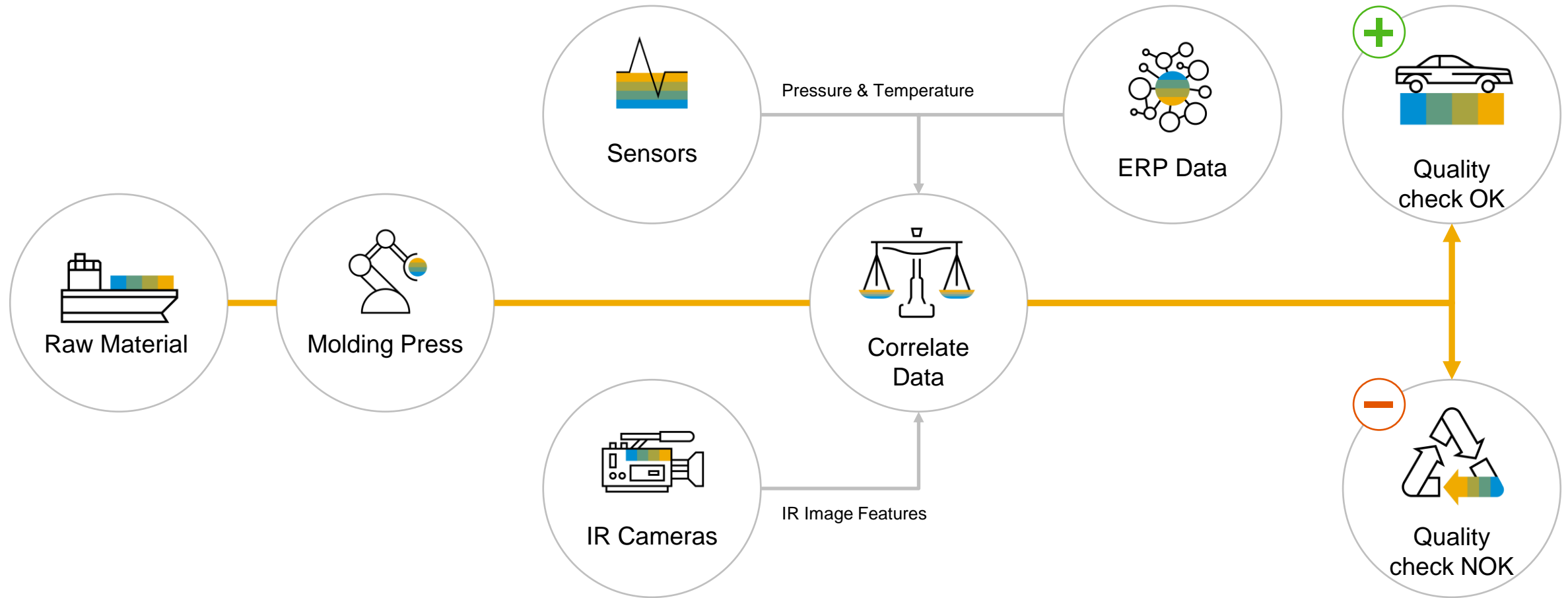
Customer Benefits

- Improved performance of predictive models
- Significant production cost savings
- Ability to detect maintenance requirements
- Insights into how to improve sensor infrastructure

Conceptual solution

Use Case: **IoT Ingestion & Orchestration**

Industry: **Manufacturing**



Backend: SAP Data Intelligence pipelines

Use Case: **IoT Ingestion & Orchestration**

Industry: **Manufacturing**

1 Stream data

| MATERIAL_ID | HEAT1 | HEAT2 | PRESSMAX | PRESSDUR |
|-------------|-------|-------|----------|----------|
| PRHO01006 | 1,105 | 805 | 66 | 33 |
| PRHO01007 | 1,103 | 803 | 63 | 33 |
| PRHO01008 | 1,100 | 800 | 70 | 33 |
| PRHO01009 | 1,100 | 800 | 70 | 33 |
| PRHO01010 | 1,100 | 800 | 86 | 33 |
| PRHO01011 | 1,100 | 800 | 58 | 33 |
| PRHO01012 | 1,100 | 800 | 63 | 33 |
| PRHO01013 | 1,099 | 799 | 60 | 33 |
| PRHO01014 | 1,100 | 800 | 60 | 33 |
| PRHO01015 | 1,102 | 802 | 86 | 33 |

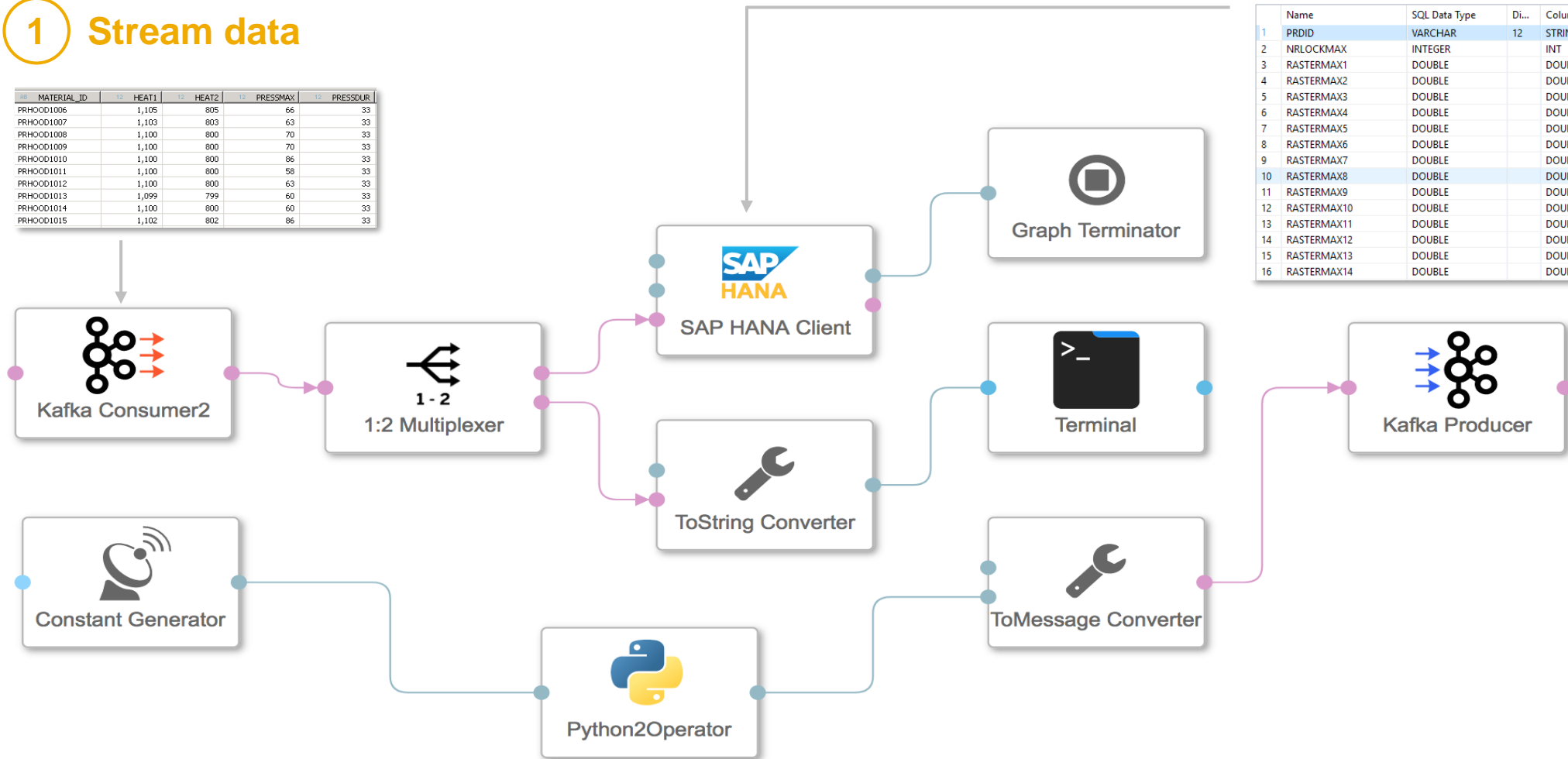


Table Name: IMG_RES_HANA

| Columns | Indexes | Further Properties | Runtime Information |
|----------------|---------------|--------------------|------------------------|
| Name | SQL Data Type | Di... | Column Store Data Type |
| 1 PRDID | VARCHAR | 12 | STRING |
| 2 NRLOCKMAX | INTEGER | | INT |
| 3 RASTERMAX1 | DOUBLE | | DOUBLE |
| 4 RASTERMAX2 | DOUBLE | | DOUBLE |
| 5 RASTERMAX3 | DOUBLE | | DOUBLE |
| 6 RASTERMAX4 | DOUBLE | | DOUBLE |
| 7 RASTERMAX5 | DOUBLE | | DOUBLE |
| 8 RASTERMAX6 | DOUBLE | | DOUBLE |
| 9 RASTERMAX7 | DOUBLE | | DOUBLE |
| 10 RASTERMAX8 | DOUBLE | | DOUBLE |
| 11 RASTERMAX9 | DOUBLE | | DOUBLE |
| 12 RASTERMAX10 | DOUBLE | | DOUBLE |
| 13 RASTERMAX11 | DOUBLE | | DOUBLE |
| 14 RASTERMAX12 | DOUBLE | | DOUBLE |
| 15 RASTERMAX13 | DOUBLE | | DOUBLE |
| 16 RASTERMAX14 | DOUBLE | | DOUBLE |

Backend: SAP Data Intelligence pipelines

Use Case: **IoT Ingestion & Orchestration**

Industry: **Manufacturing**

2 Extract Features

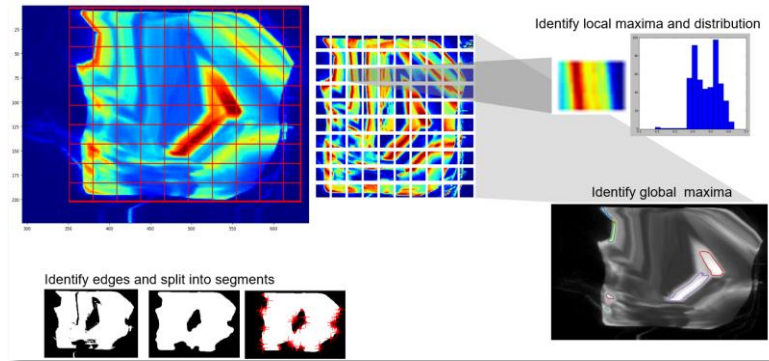
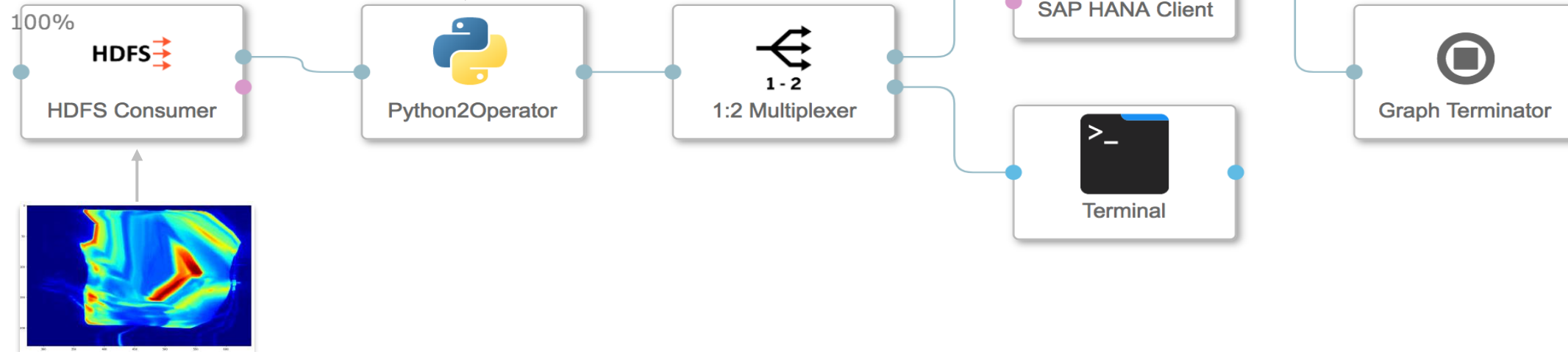


Table Name: PPARAM

| Columns | Indexes | Further Properties | Runtime Information |
|---------------|---------------|--------------------|------------------------|
| Name | SQL Data Type | Di... | Column Store Data Type |
| 1 MATERIAL_ID | NVARCHAR | 10 | STRING |
| 2 HEAT1 | INTEGER | | INT |
| 3 HEAT2 | INTEGER | | INT |
| 4 PRESSMAX | INTEGER | | INT |
| 5 PRESSDUR | INTEGER | | INT |



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SAP Data Intelligence – Recent innovations



Hybrid Data Management –
Integration of Information
Steward, improved
integration with Data
Services



TCO reduction – DI Cloud
Autoscaling, Hibernation and
price reduction



BTP Data & Analytics –
Integration with HANA
Data Lake DB and HDL
Files



Connectivity – Added
Snowflake, Redshift, Big
Query and more



Data Catalog – Public
APIs for the catalog,
integration with Bigd



Enterprise grade –
Resilient pipelines, Mass
replication, Monitoring
APIs

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SAP Data Intelligence – Upcoming innovations*



Hybrid Data Management –
Extending integration with
Information Steward



TCO reduction – Shared
tenant option



BTP Data & Analytics –
Catalog integration with DWC
and SAC, Tighter integration
of data integration features
with DWC

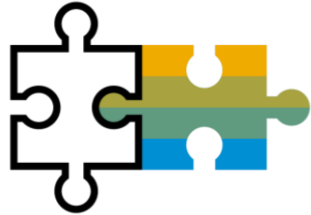


Connectivity – Adding
Teradata, PostgreSQL
and more



Data Catalog – Extend
public APIs, Improve
lineage (Column-level,
ABAP)

SAP Data Intelligence – Longer-term roadmap priorities*



Deeper Application Integration

Align integration model to consume and interact with Apps



Business Content & Templates

Extend both SAP-led and partner-led content store for pre-packaged industry and LoB content



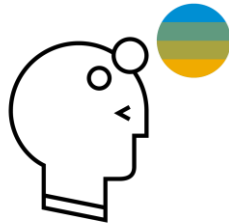
Extend Span of Connectivity

Support more cloud services (e.g. DWHs), and additional data sources



Synergy with HANA Cloud, DWC and SAC

Tighter integration of the BTP UD&A portfolio



Get (even) Smarter

Apply ML and intelligence where possible. Augmented Data Integration & Active Metadata & Data Governance, Automated Data Classification, Quality and Monetization.



Open Data Catalog and end-to-end Governance

Extend metadata exchange and improve integration with 3rd party catalogs. Make data quality rules smarter, and add enforcement for data privacy rules. Improve collaboration.



Unified & Hybrid Technologies

Fine tune consolidation and alignment with on-prem EIM portfolio, enabling hybrid data fabric scenarios.

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Thank you.

Contact information:

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