Data Driven Innovation:

Modern Data Platform as Foundation for Transformation and New Services

Karsten Haldenwang, SAP

Public

September 2017

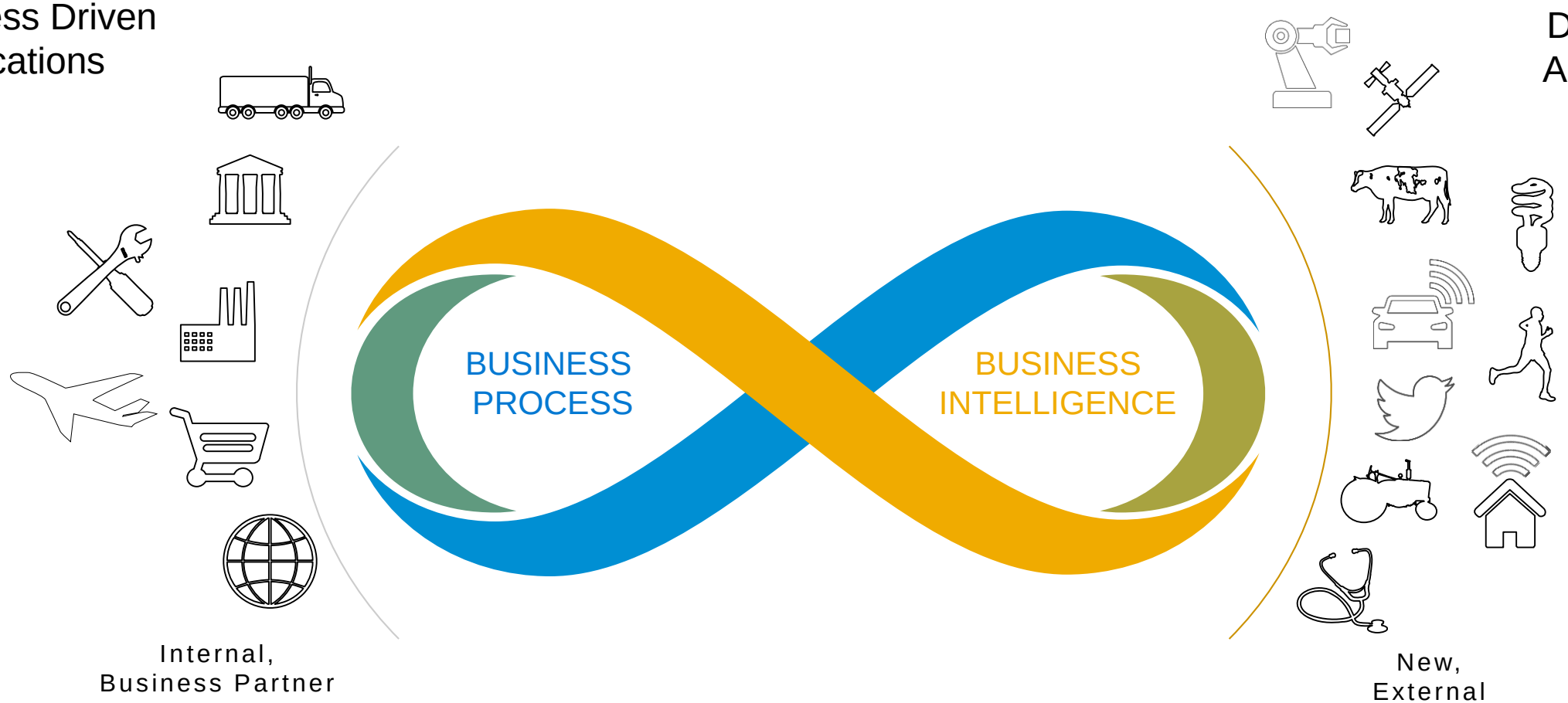
SAP Run Simple

DATA
Connected Data as a Strategic Asset

From Connected Data to Insight to Action

Process Driven Applications

Data Driven Applications



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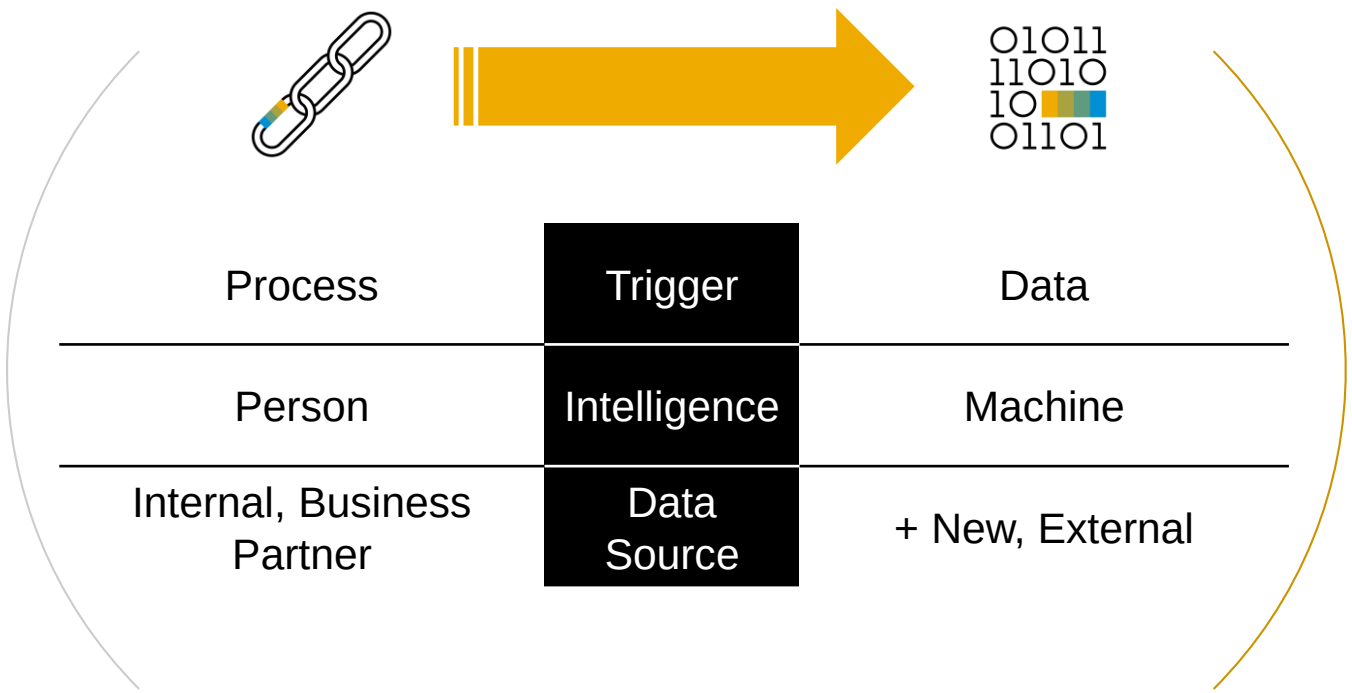
From Data to Data Driven Applications

Process Driven Applications



Data Driven Applications

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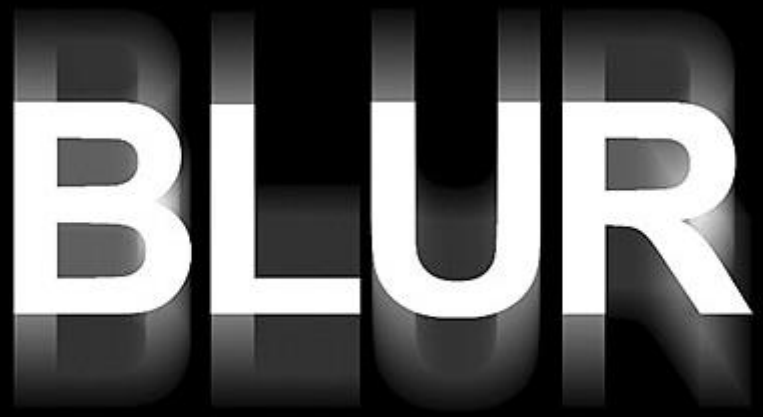
DIGITAL / PHYSICAL



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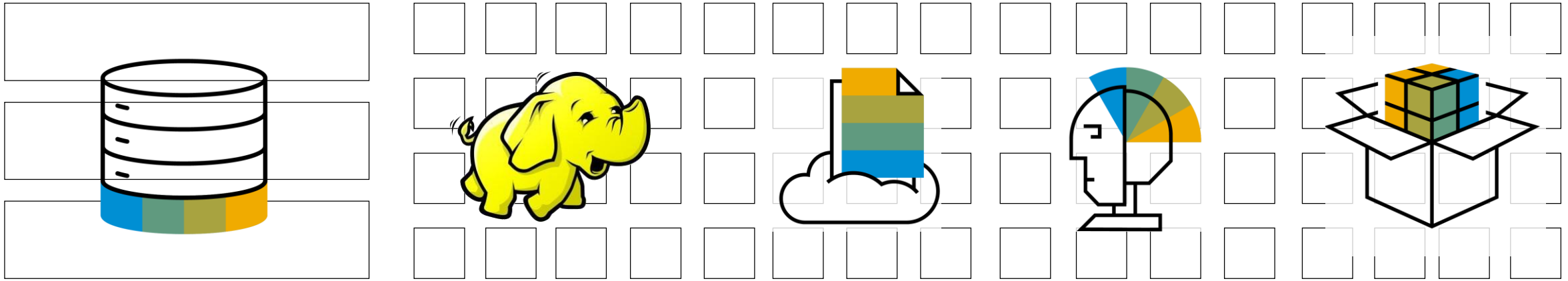
New Challenges New Technologies New Challenges

New challanges require new technologies

Distributed systems in a distributed landscape



Existing Systems

Hadoop/Spark/
NoSQL

Cloud Storage
(i.e. AWS S3)

Machine
Learning
(Python, Spark,
Tensorflow)

Containers
(Kubernetes, Docker)

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Data volume is NOT the problem anymore

> **Delivering connected data across on-premises and cloud sources is not trivial**, especially when it involves large data volumes, complex data models, and high speed of ingestion.”

Noel Yuhanna,
Forrester

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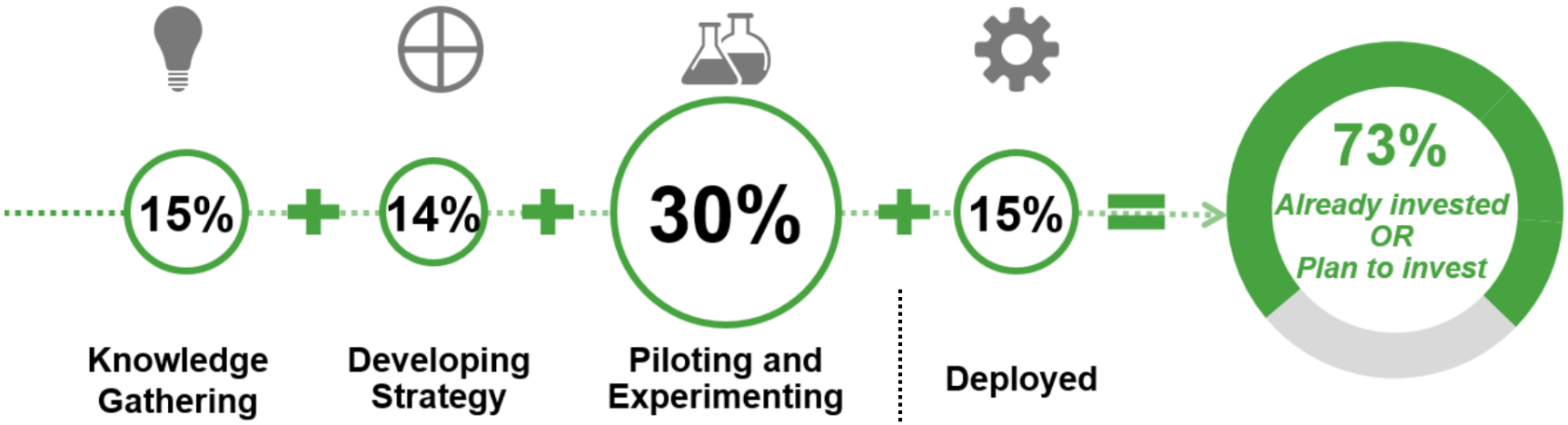
Gartner: „Still challenging to get Hadoop projects into production stage“



(1) Skills

(2) Technology Integration Challenges

(3) Determining Value

Gartner, 2017 (ID: G00310700)

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Supporting Data Innovation Projects…

From Initial Pilot to Large Scale Success

PIONEER

Show possibilities

Inspire business

Get buy-in

AUTOMATE

Automate & orchestrate

Schedule & monitor

Document

SCALE

Cloud deployment

Governance

Security

USER ACCEPTANCE

Self-Service Data Preparation

Data driven apps

Use your own tools & languages

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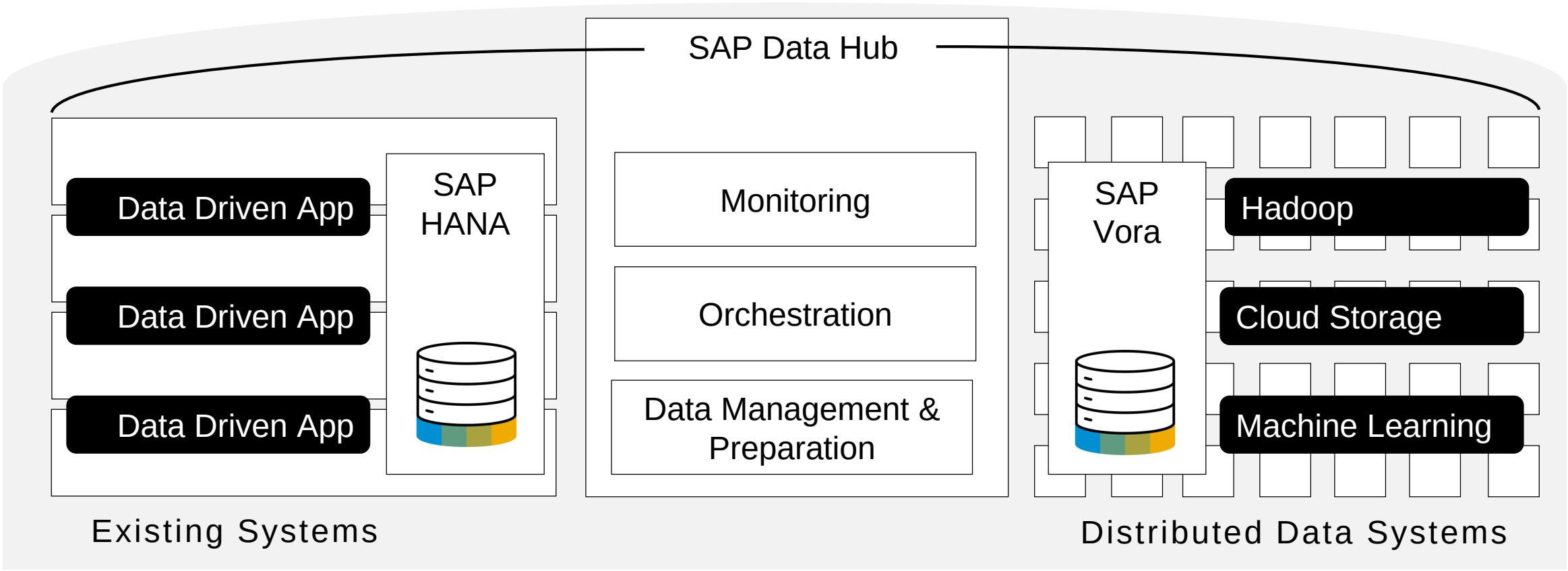
Platform for Data Driven Applications

Simplify: Existing Skills, Technology Integration, Stable Operations



SAP Cloud Platform

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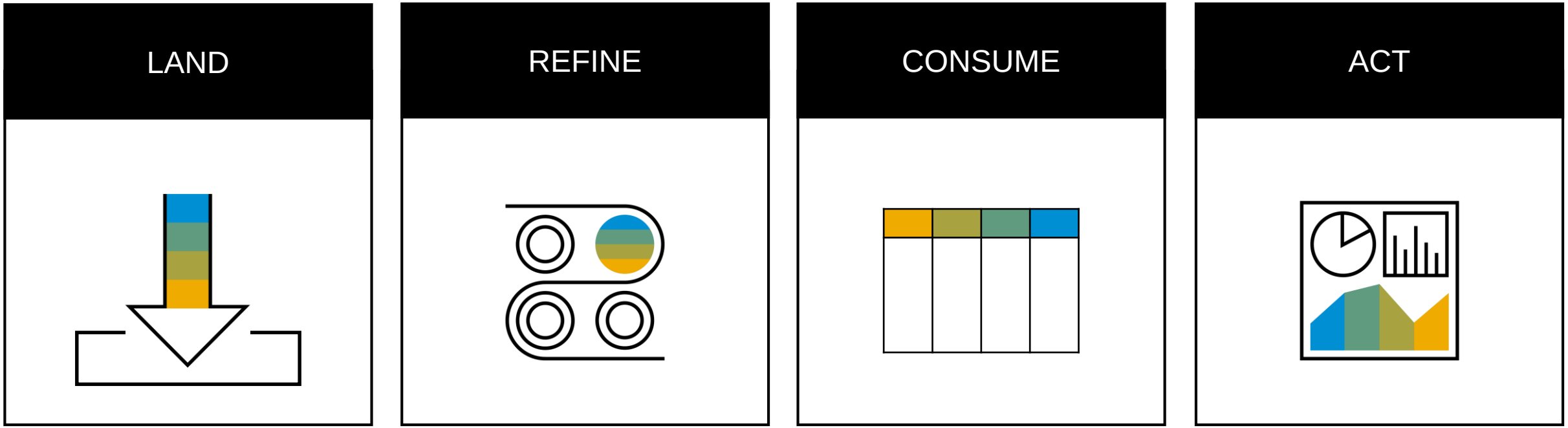
From Data to Data Driven Applications



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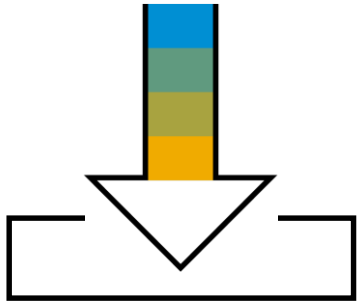
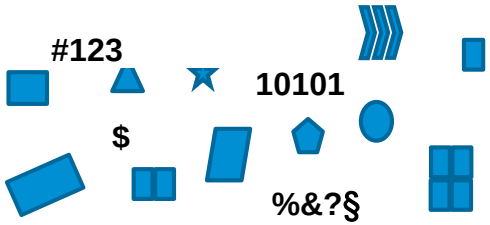
From Data to Data Driven Applications

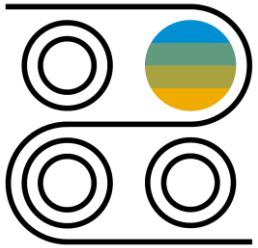
LAND



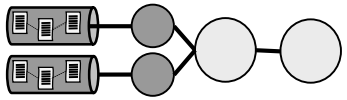


SAP DS | HDFS | S3

REFINE



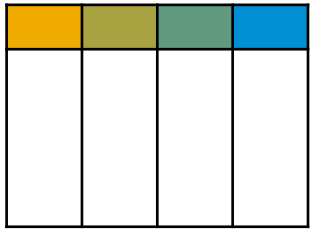
Join Cleanse Script Anonymize
Filter Look-up Mask Parse

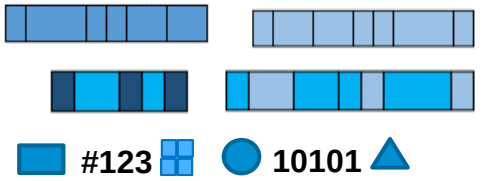


Spark Job Python Script

Data Hub

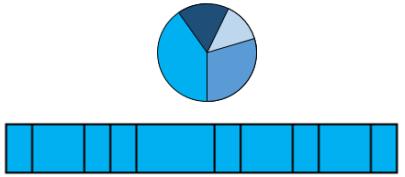
CONSUME





Vora

ACT



HANA | BW | Apps

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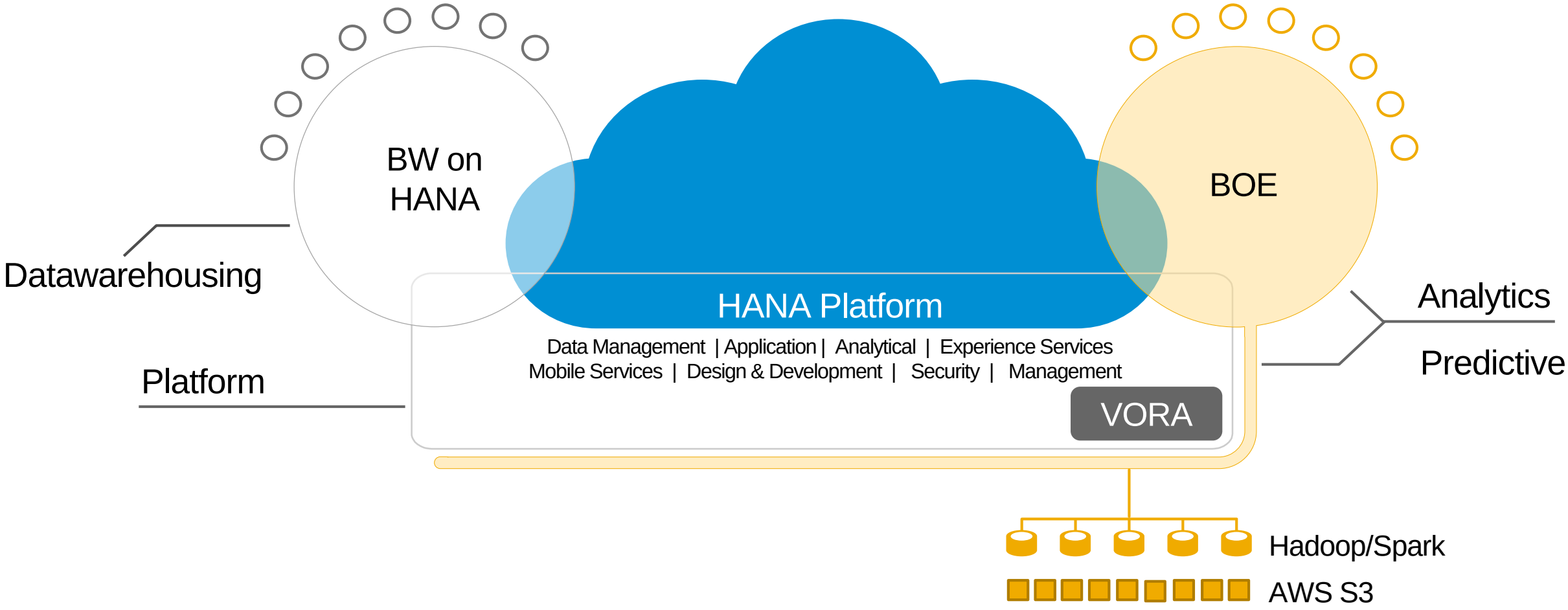
Kundenbeispiel
High-Level Architecture



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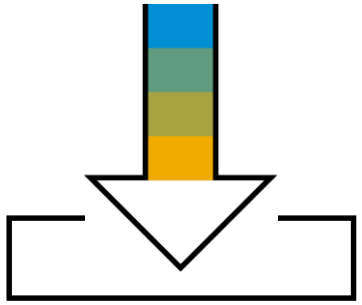
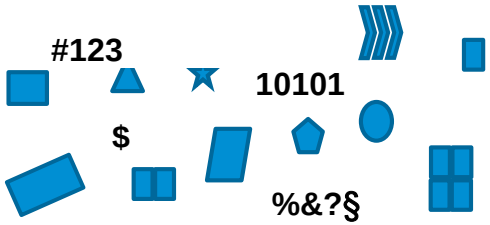
From Data to Data Driven Applications

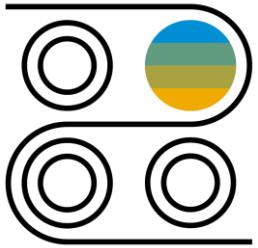
LAND





SAP DS | Kafka | HDFS | S3

REFINE



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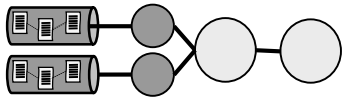

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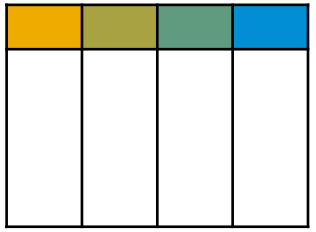
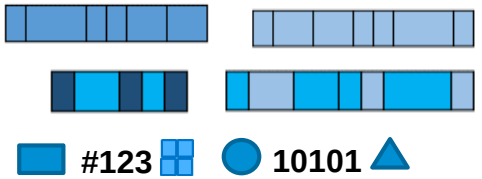
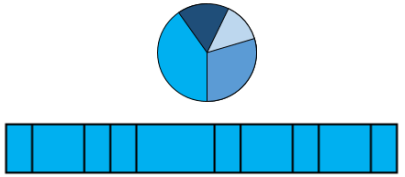




Vora

ACT



HANA | BW | Apps

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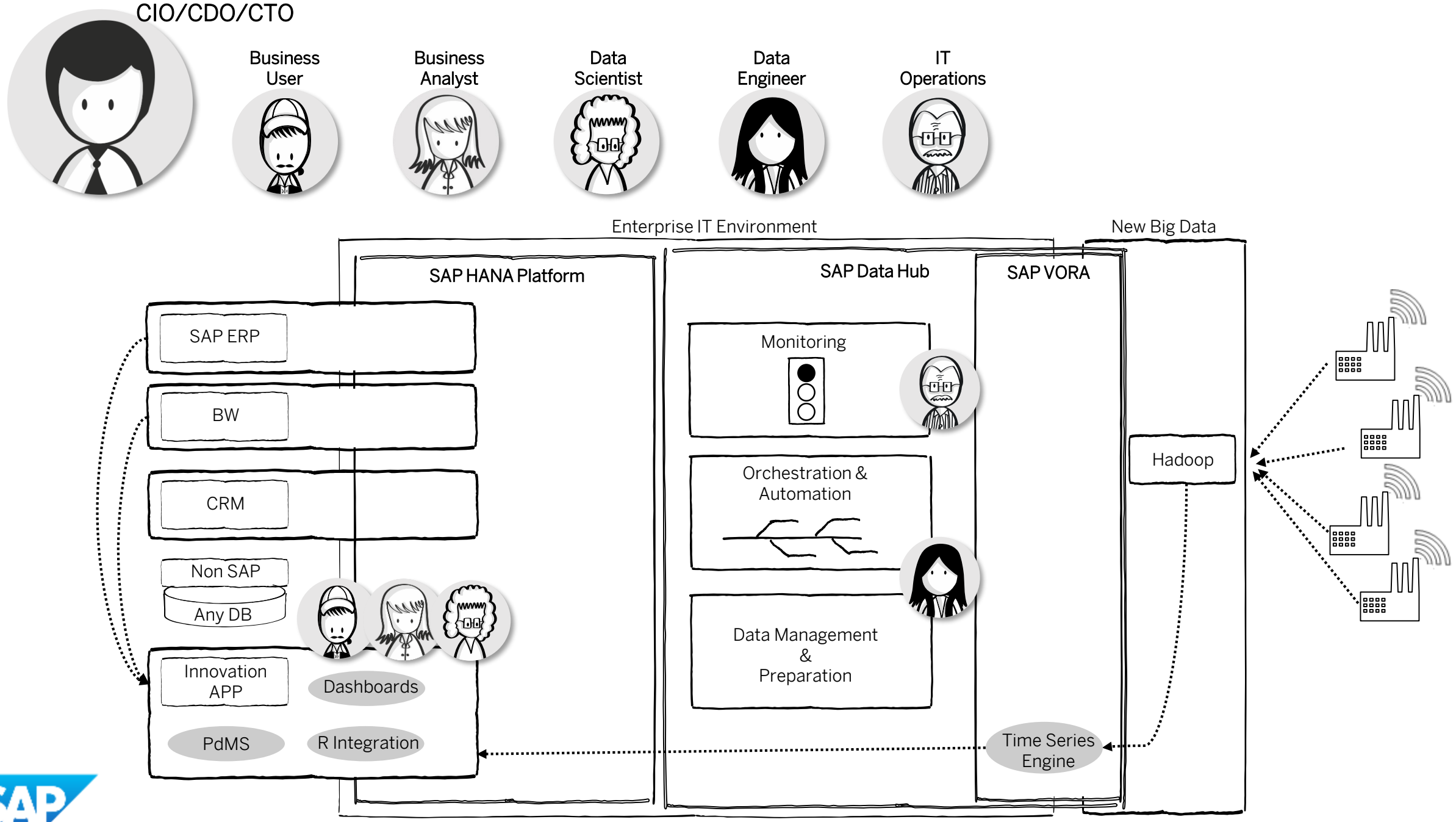
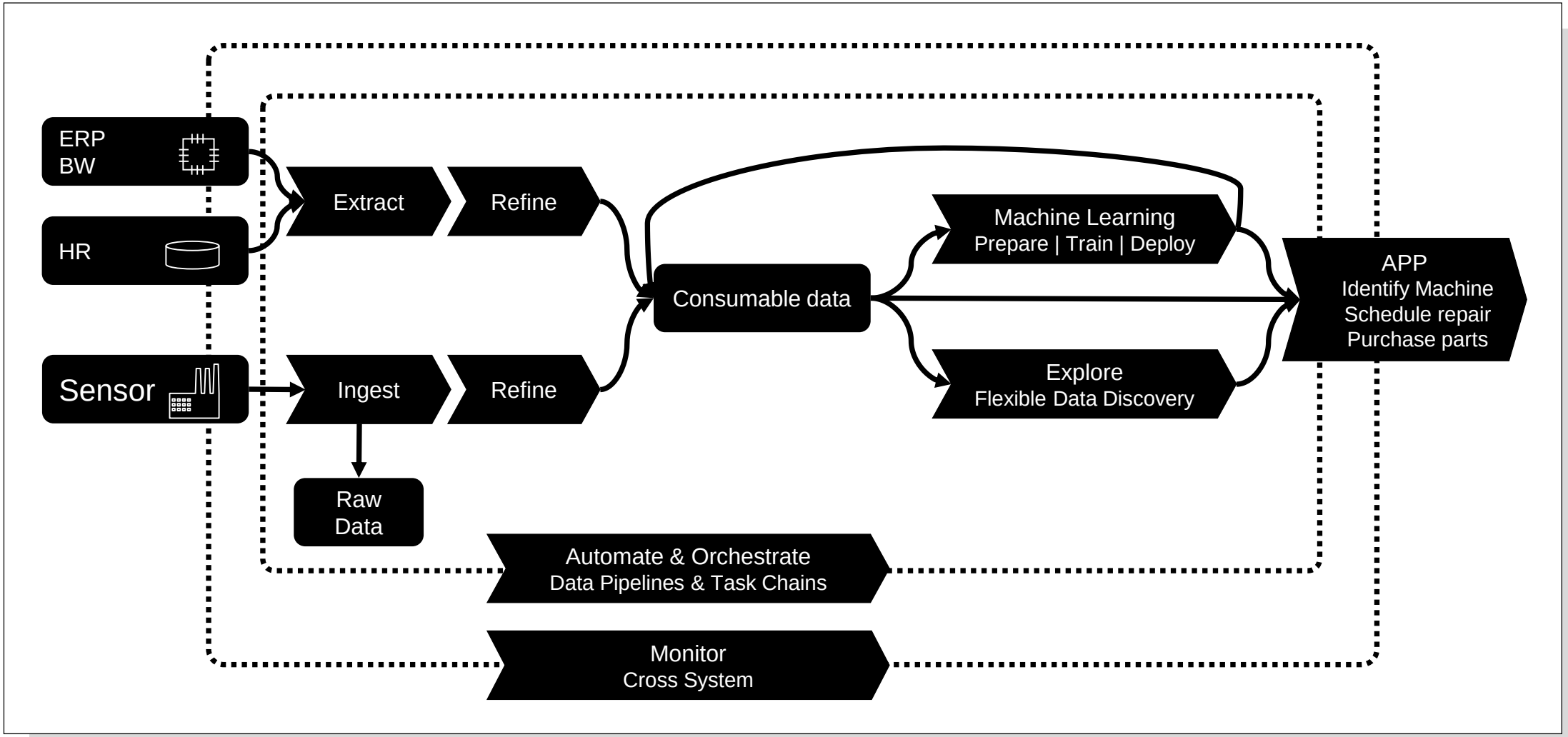

CIO/CDO/CTO
Business User
Business Analyst
Data Scientist
Data Engineer
IT Operations
Enterprise IT Environment
New Big Data
SAP HANA Platform
SAP Data Hub
SAP VORA
SAP ERP
BW
CRM
Non SAP
Any DB
Innovation APP
Dashboards
PdMS
R Integration
Monitoring
Orchestration & Automation
Data Management & Preparation
Hadoop
Time Series Engine

Task Chain for IoT Scenario



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SAP Data Hub

SAP Data Hub – Scope

SAP DATA HUB - Distributed Data Hub & Refinery

Refines enterprise big data across a heterogeneous data landscape to drive digital business decisions

Data Cockpit

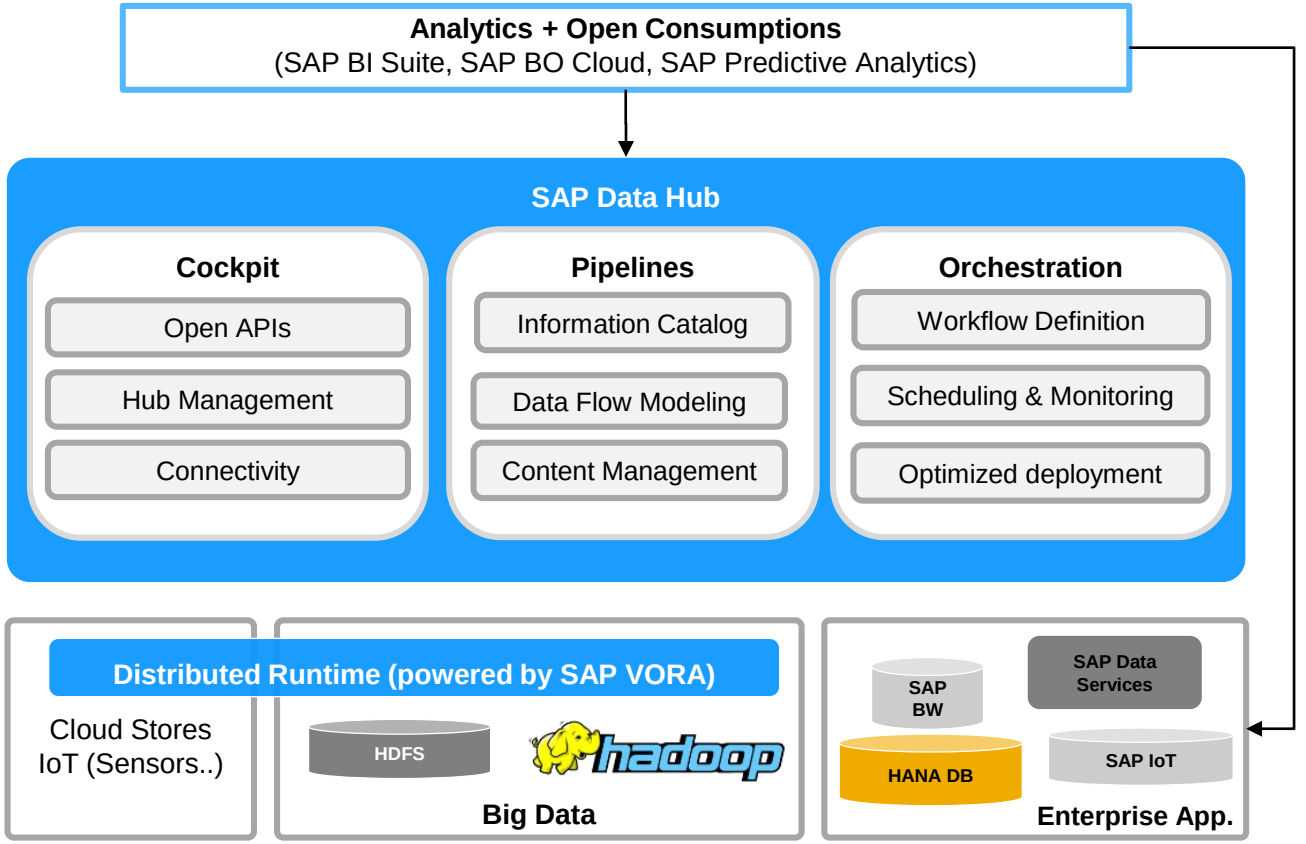
- Role-based Hub Experience with a modern UX
- Creation of logical hub structure e.g. zone management
- Connectivity to hybrid system landscapes
- Big Data Discovery & Security

Data Pipelines

- Data Ingestion (Connectors) and Integration
- Data Pipelines suited for Server less Computing
- Data Quality Flow with predefined operations
- Meta Data Services across stores with Lineage

Orchestration

- Workflow scheduling
- Monitoring and alerting
- Pipeline deployment to SAP HANA and Vora



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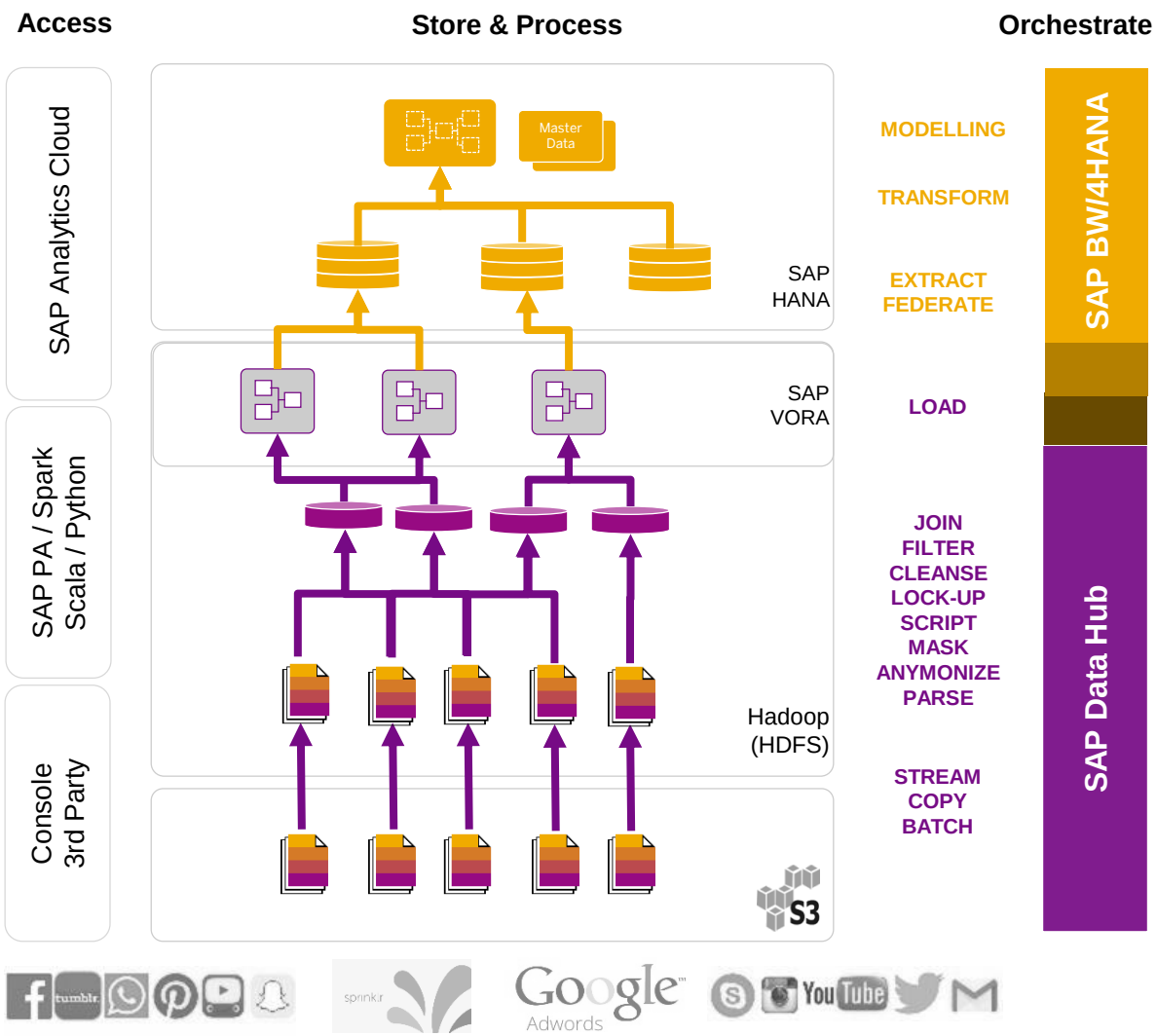
SAP Data Hub – Analyzing Web Log Data with Data Warehouse



Example Scenario

- Combine refined big data with enterprise data and corporate master data
- Extract or federate data into SAP BW/4HANA

- Ingest Data into S3 as Landing Zone for data
- Orchestrate and schedule all related processes
- Implement transformations and data pipelines
- Harmonize data structures and look up of reference data
- Execute operations on large data volumes

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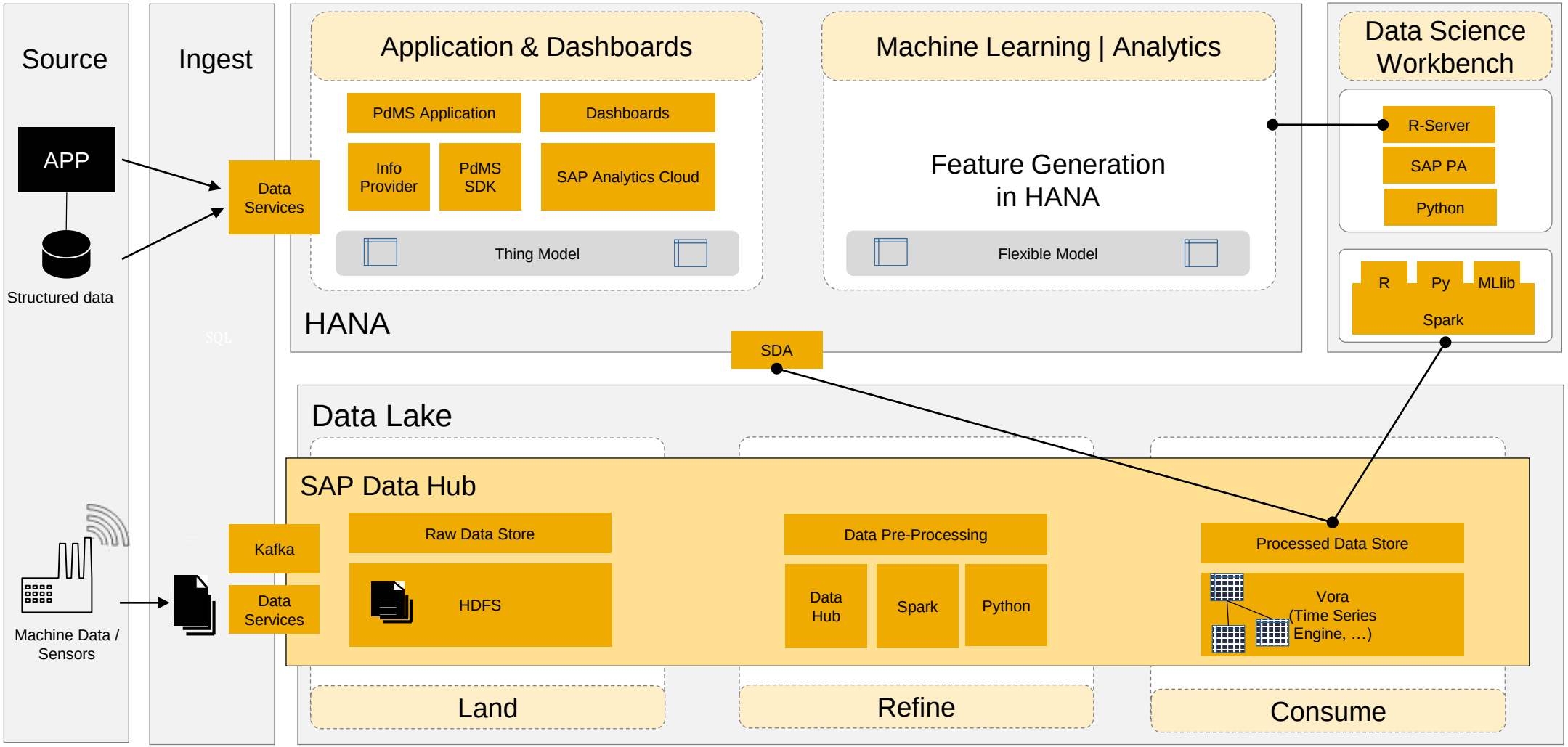
IoT Architecture for Predictive Maintenance



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USER EXPERIENCE

Same thing – different perspective

A logistic regression takes me only a few lines of code.

Data Scientist

```scala
import org.apache.spark.mllib.classification.{SVMModel, SVMWithSGD}
import org.apache.spark.mllib.evaluation.BinaryClassificationMetrics
import org.apache.spark.mllib.util.MLUtils

// Load training data in LIBSVM format.
val data = MLUtils.loadLibSVMFile(sc, "data/mllib/sample_libsvm_data.txt")

// Split data into training (60%) and test (40%).
val splits = data.randomSplit(Array(0.6, 0.4), seed = 11L)
val training = splits(0).cache()
val test = splits(1)

// Run training algorithm to build the model
val numIterations = 100
val model = SVMWithSGD.train(training, numIterations)

// Clear the default threshold.
model.clearThreshold()

// Compute raw scores on the test set.
val scoreAndLabels = test.map { point =>
  val score = model.predict(point.features)
  (score, point.label)
}

// Get evaluation metrics.
val metrics = new BinaryClassificationMetrics(scoreAndLabels)
val auROC = metrics.areaUnderROC()

println("Area under ROC = " + auROC)

// Save and load model
model.save(sc, "target/tmp/scalaSVMWithSGDModel")
val sameModel = SVMModel.load(sc, "target/tmp/scalaSVMWithSGDModel")
```

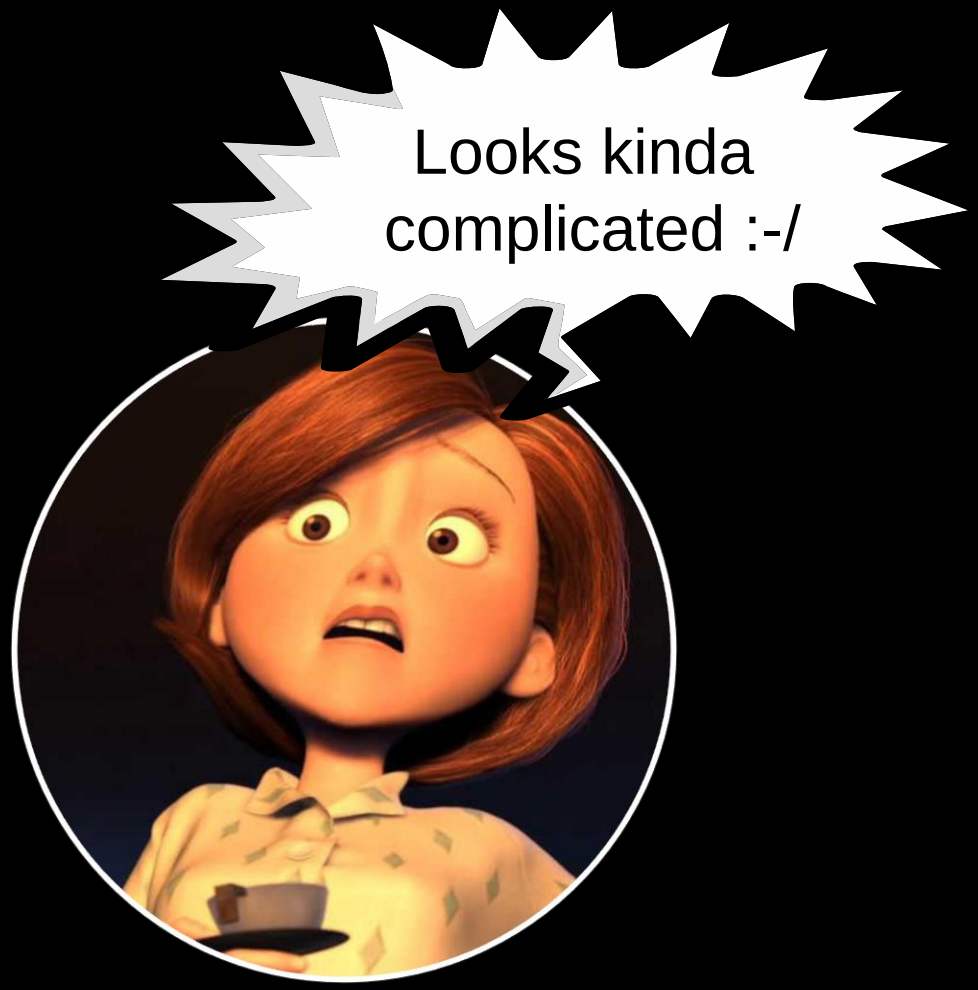
Split data

Train one model

Apply the model on new data

Evaluate model quality

Source: http://spark.apache.org/docs/latest/mllib-linear-methods.html



Business Analyst

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Split data

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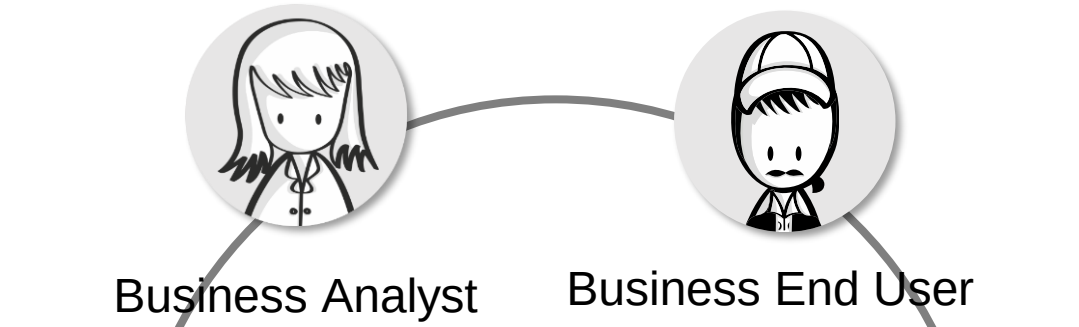
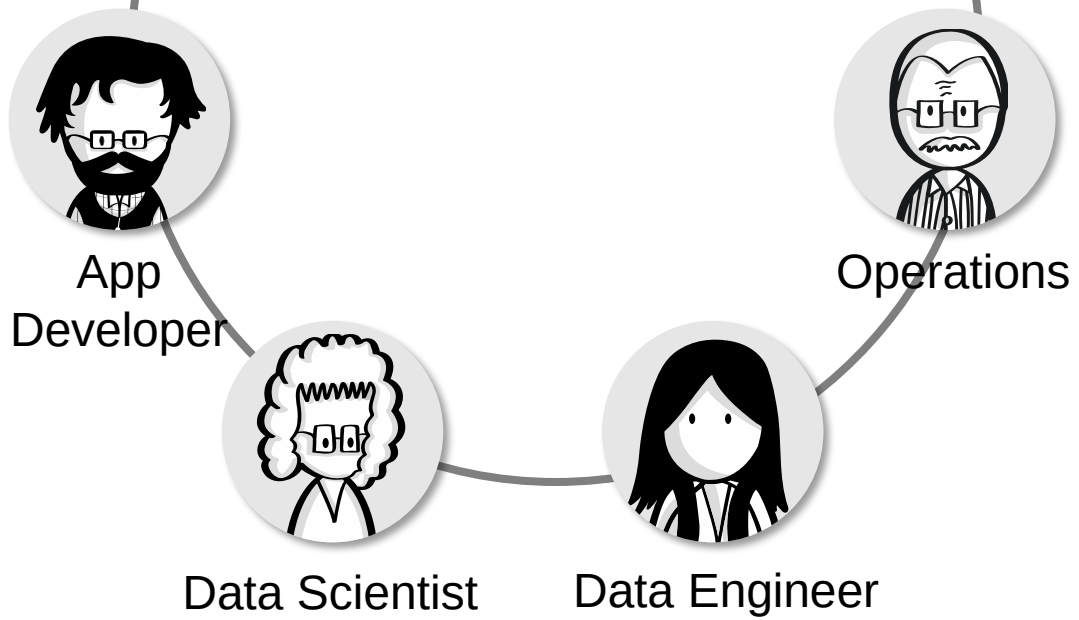
Data Innovation is a Team Effort



- Ease of use
- Big Data Self Service
- Use existing skills



- Easy data access and collaboration
- Automation, orchestration & documentation
- Monitoring across systems

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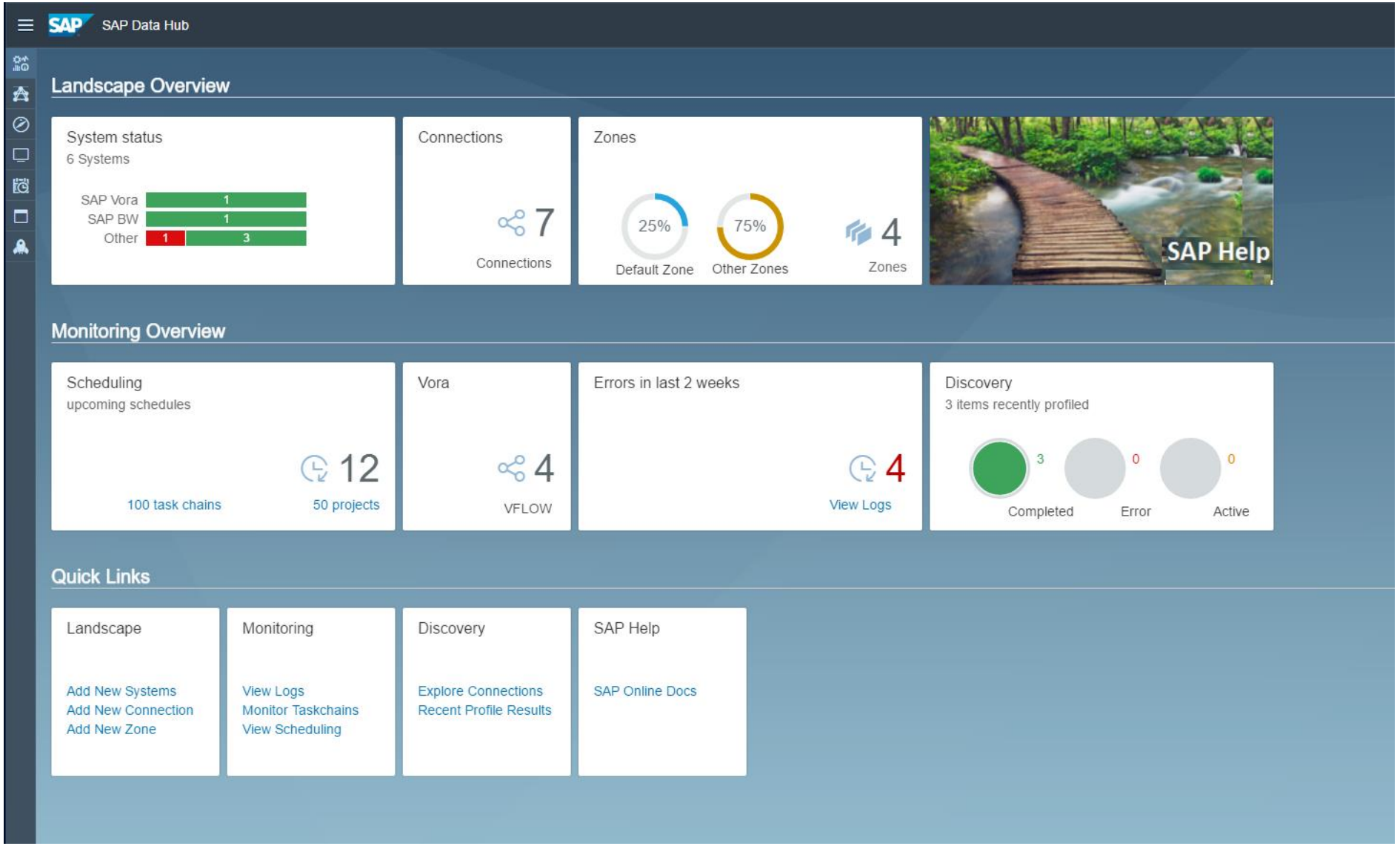
Cross System Monitoring & Management

IT Operations



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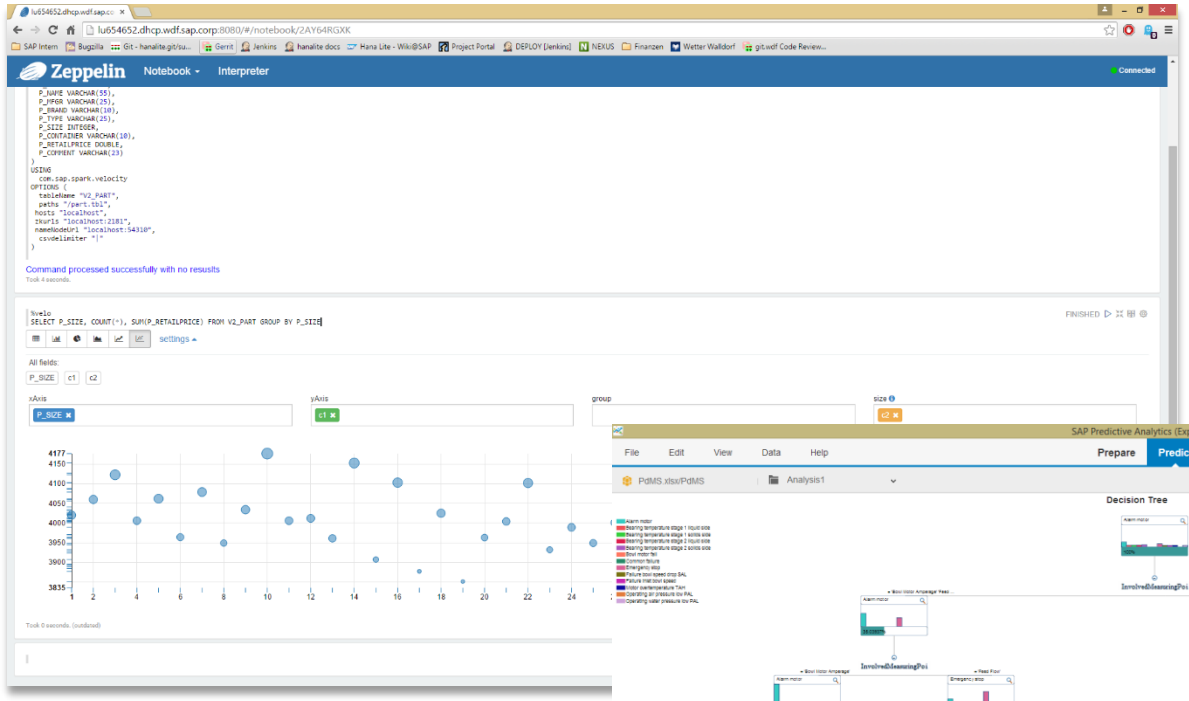
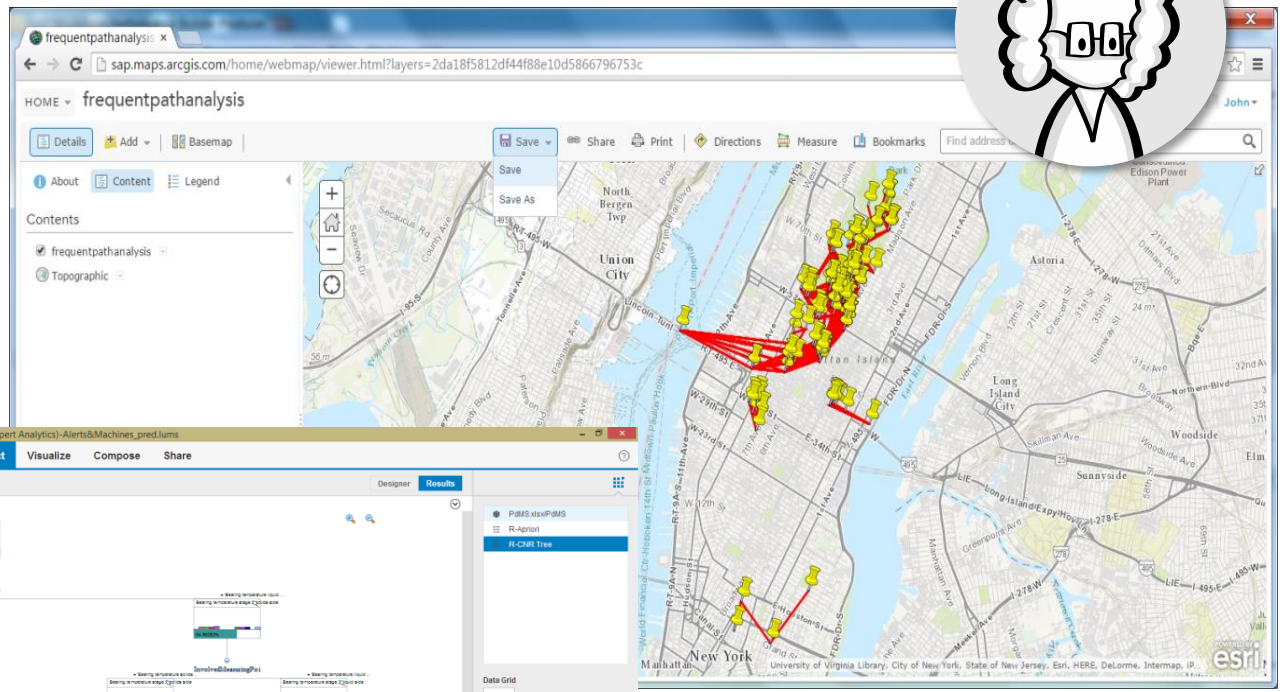
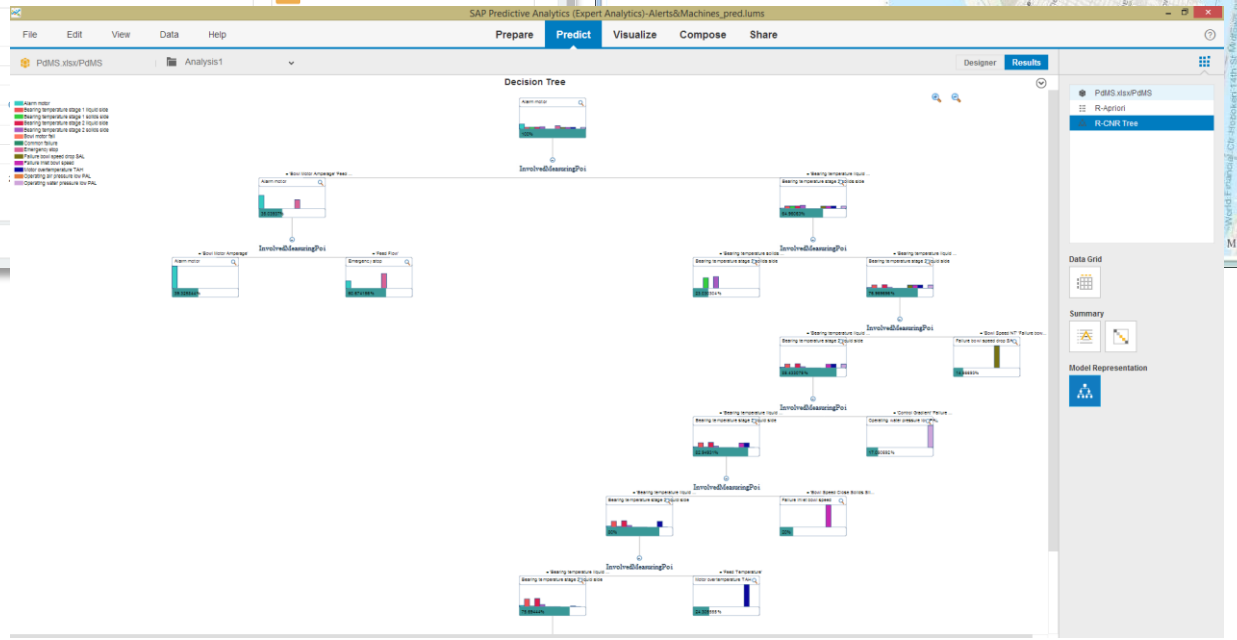
Data Scientist – Apache Zeppelin & SAP Predictive Analytics

Data Scientist







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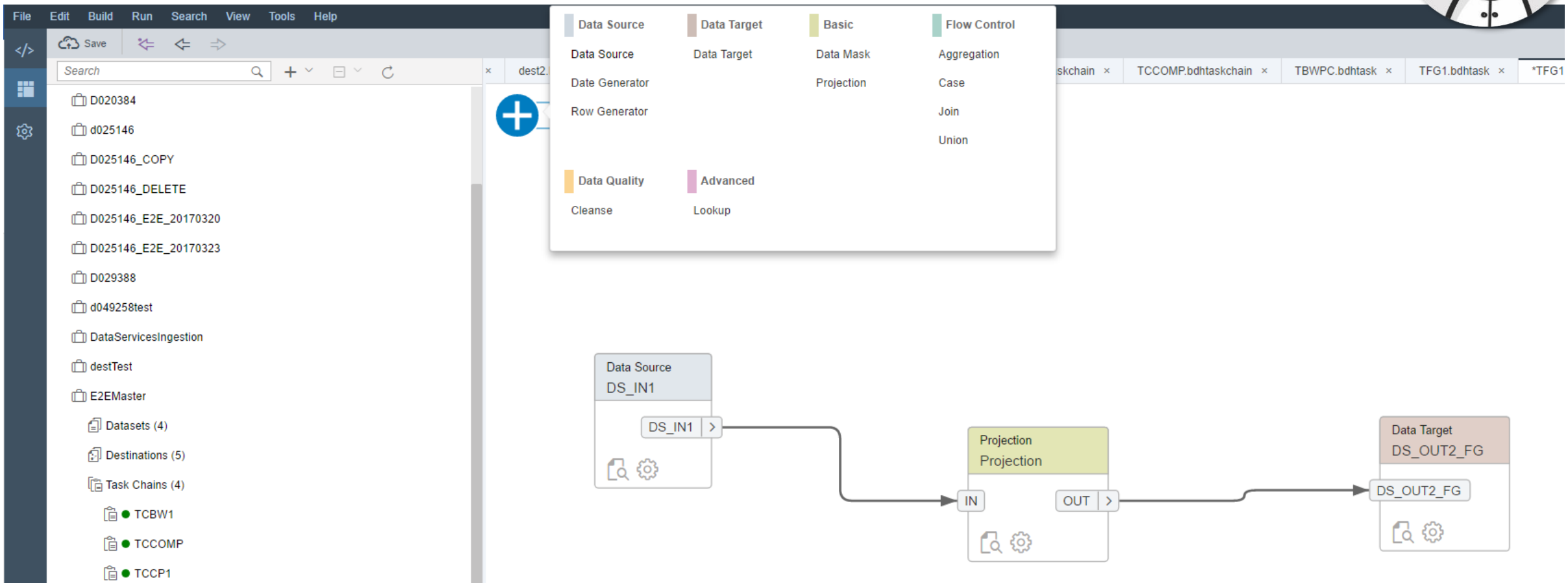
Big Data Self-Service Data Preparation

Business Analyst



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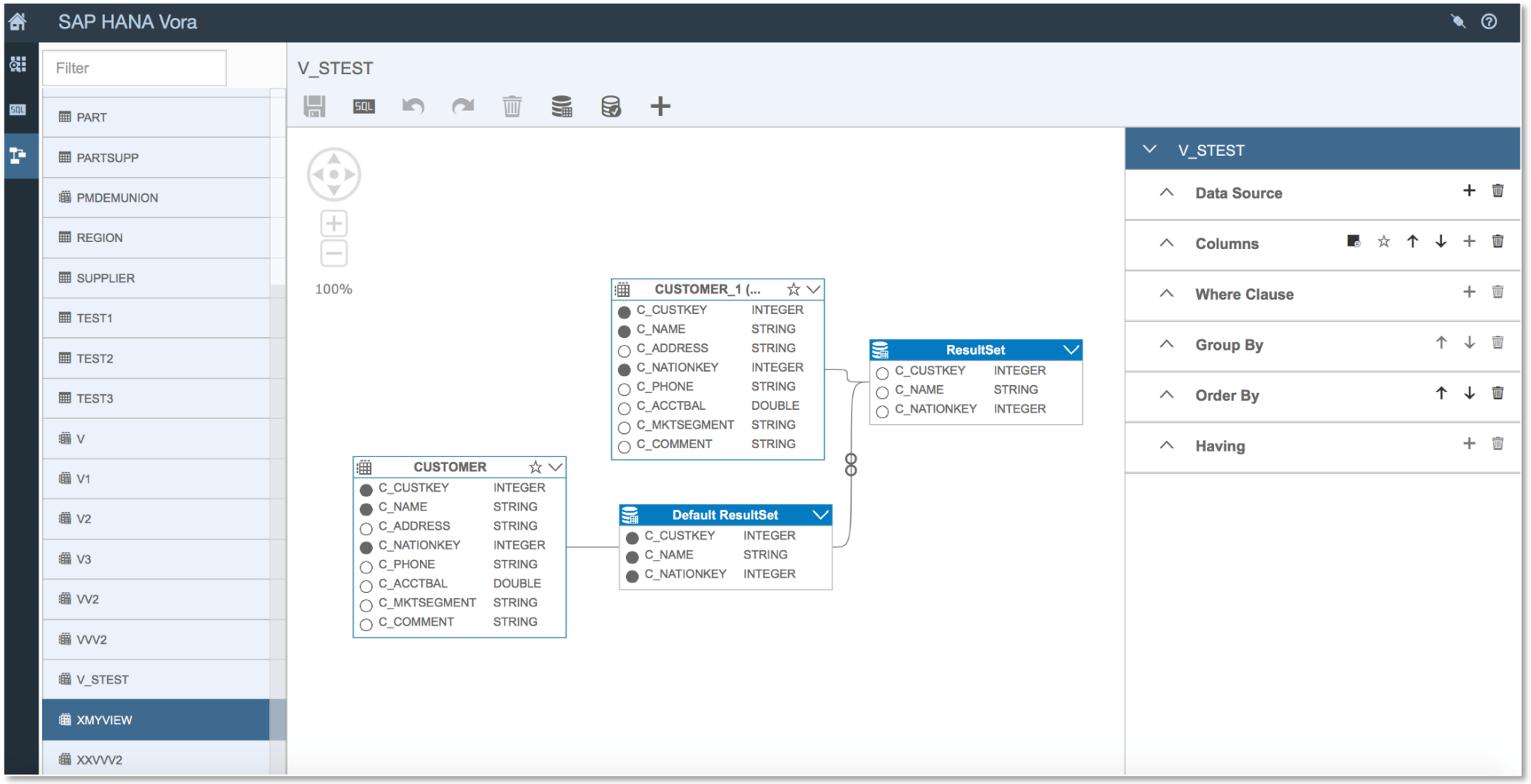
Big Data Self-Service Data Modelling

Business Analyst



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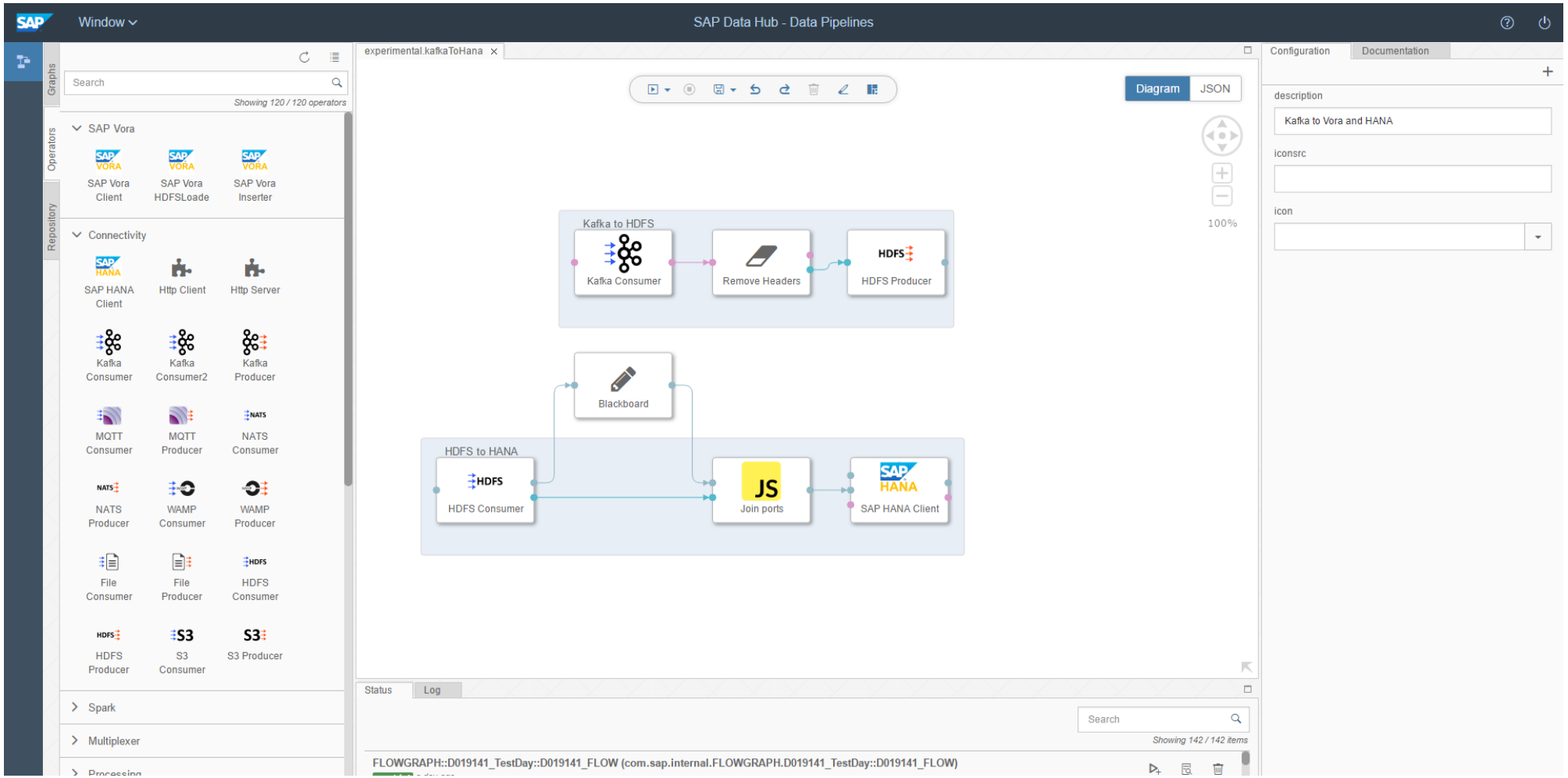
Design Cross-System Task Chains

Data Engineer



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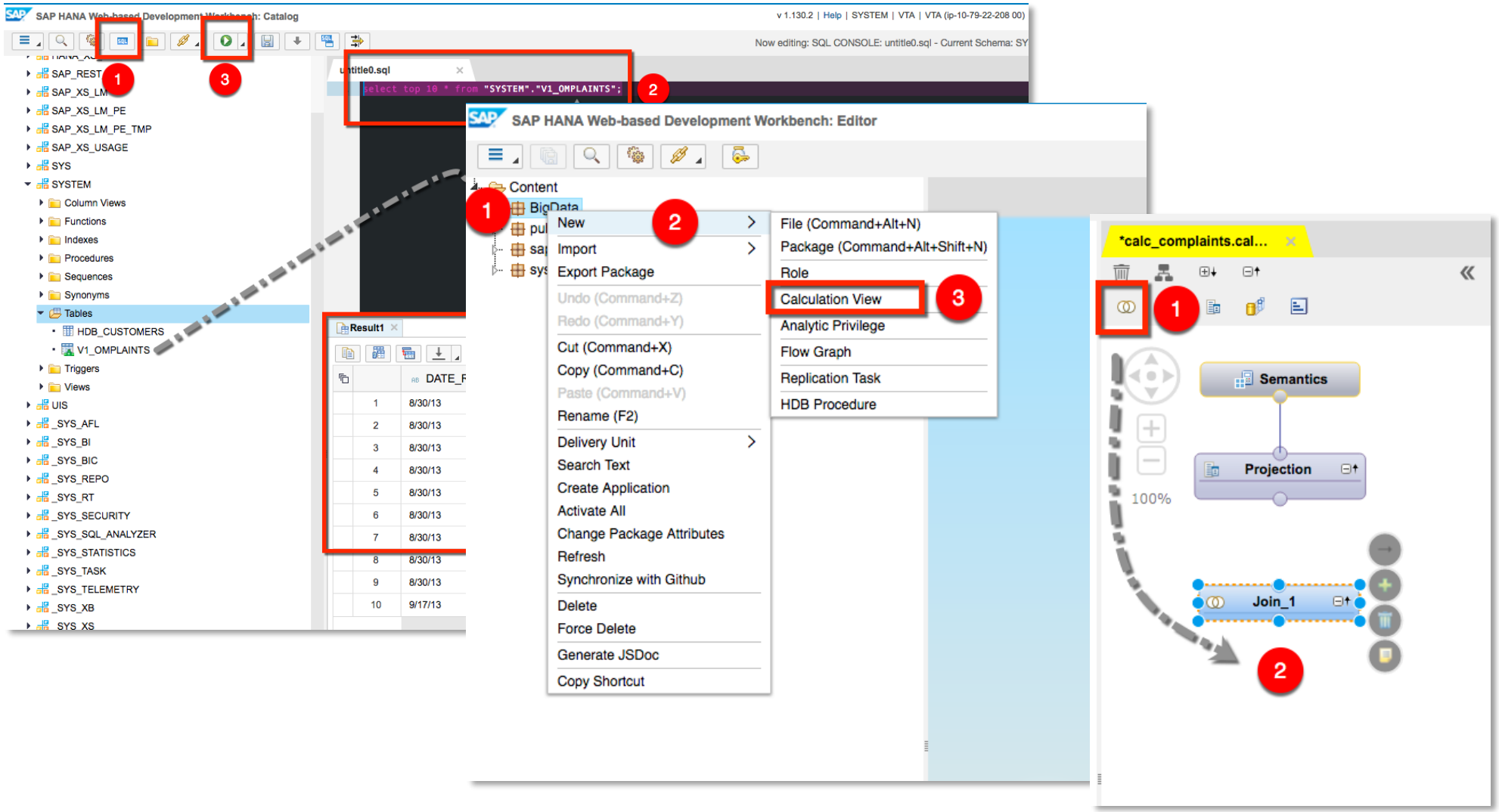
HANA Developer

Data Engineer



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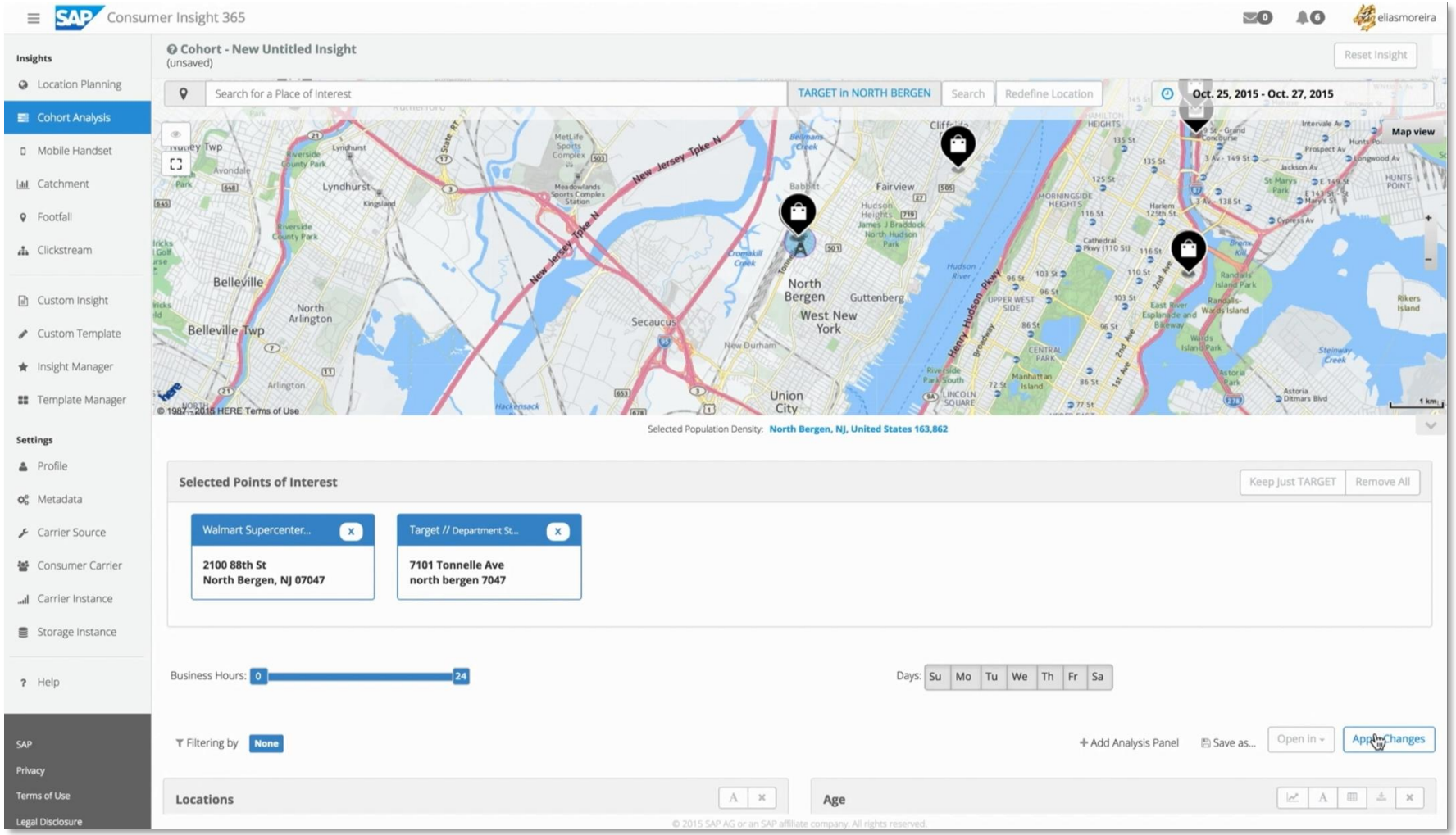
Consume Data Driven Application

Business User



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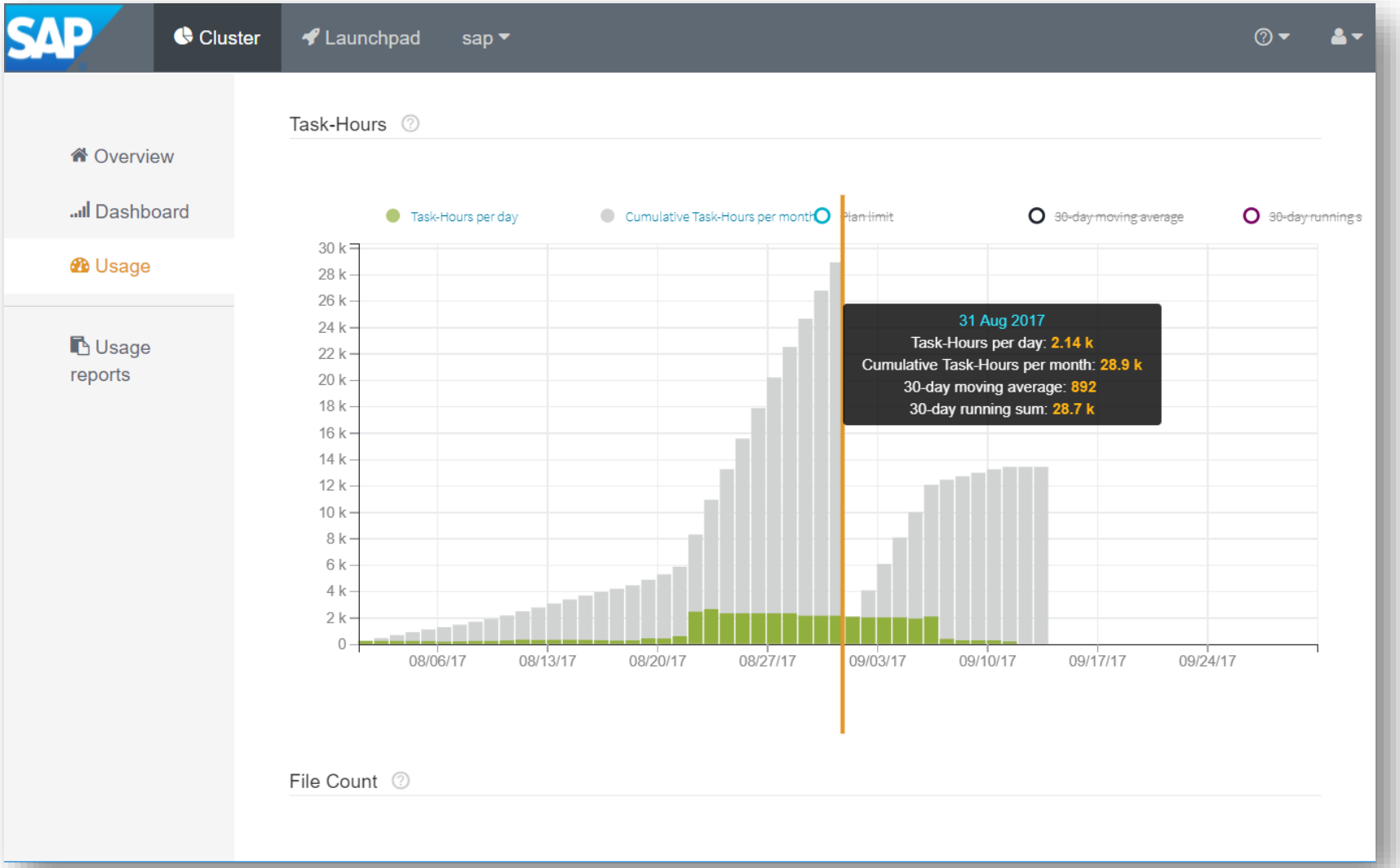
Stable.Fast.Predictable.

SAP Cloud Platform Big data Service



IT Operations

Stable & Fast:

- Jobs execute and
- Execute faster

Autoscaling

- Always ON
- Compute Burst

Cost & Ease

- Predictable & Transparent
- Consumption NOT Hardware
- No sizing needed

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And now what … ?

~~H~~ANA Express (here)

~~V~~ora Developer Edition (here)

~~V~~ora GitHub Code Snipets (here)

~~H~~ANA Academy on YouTube

~~O~~pen SAP Course (here)

Self Learning

Design Thinking

SAP Tech Academy

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Thank you.

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SAP Run Simple