

# IT-OT Convergence – Better Together with SAP & OSIsoft

## What, Why & How of the New SAP Leonardo

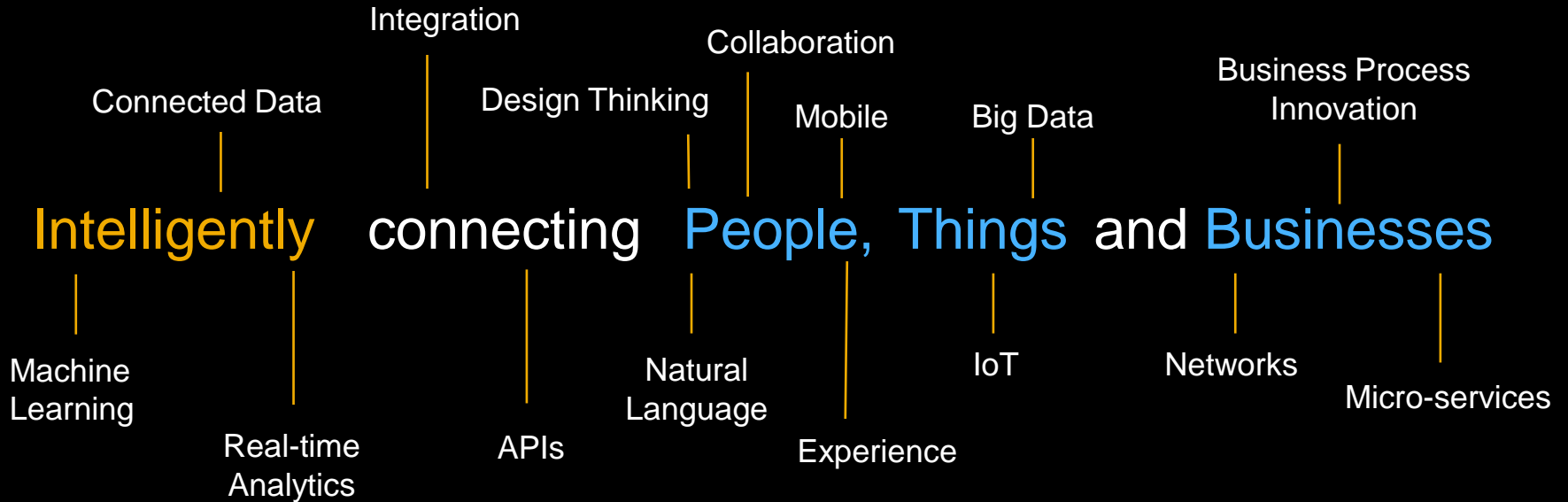
Presented by Frank Ruland



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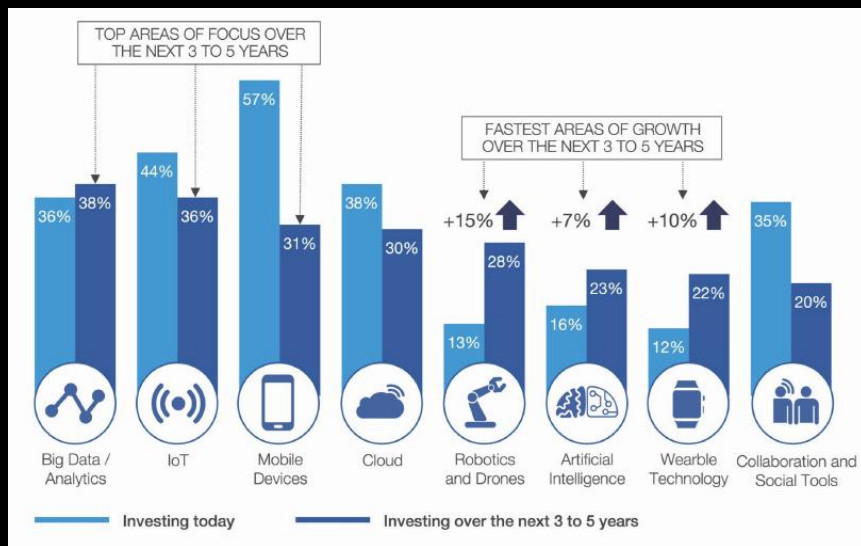
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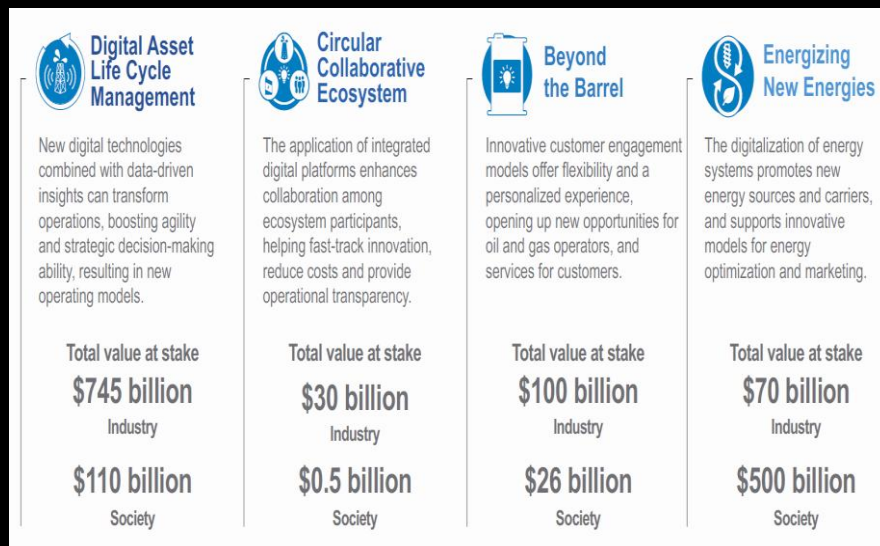


# Oil and Gas Digital Trends

## Investment in digital technologies

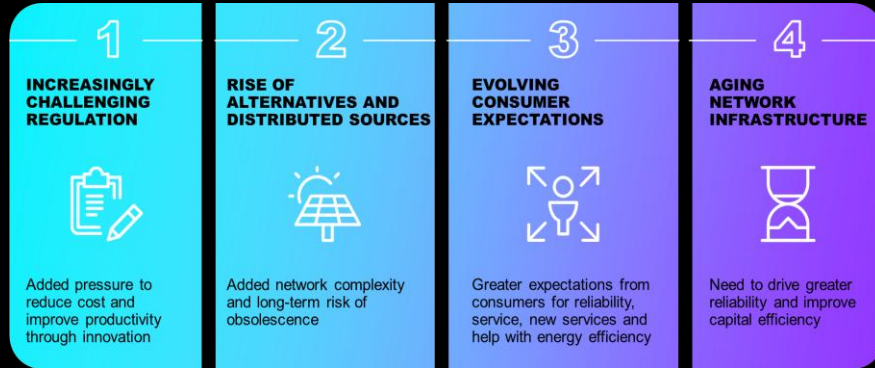


## Digital themes and resulting initiatives

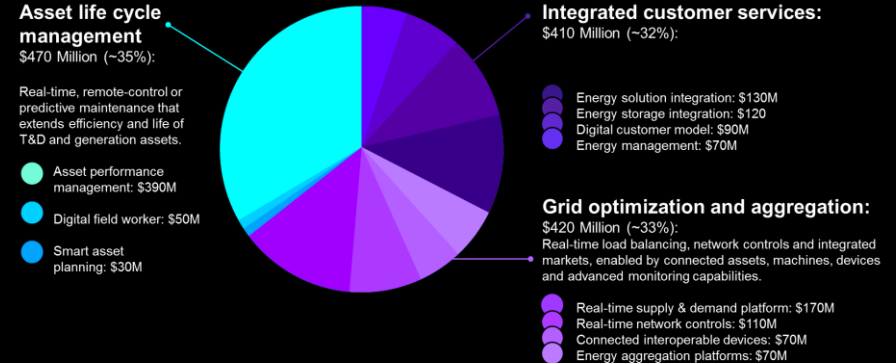


# Utilities Digital Trends

Digital Trends and Challenges need to be balanced

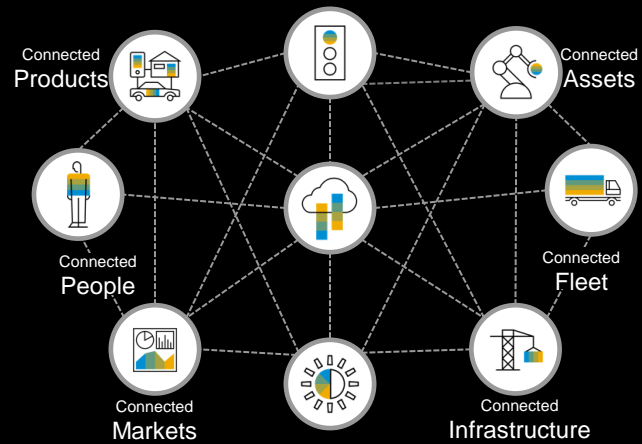


Digital themes and resulting initiatives



# How IoT Impacts Business

- Every “Thing” is Connected
- Every “Thing” is Intelligent
- Every “Thing” in the Moment
- Every Business Process to Every “Thing”



# SAP Leonardo digital innovation system

Design Thinking  
Services

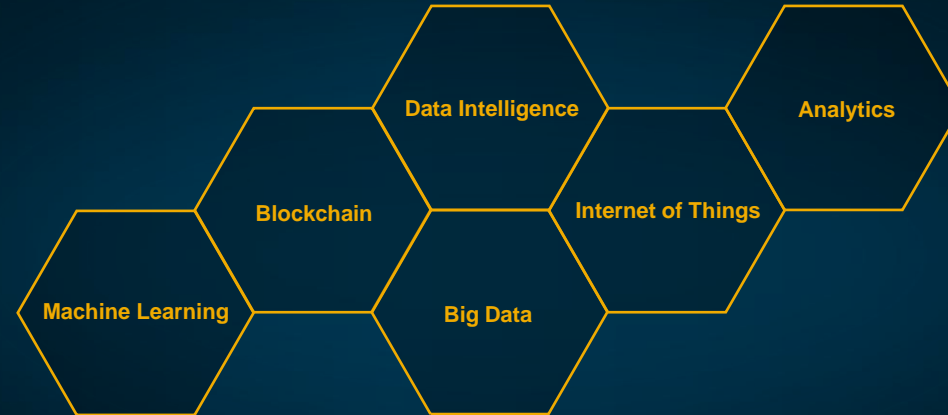
Solution Ideation  
& Vision

Rapid  
Prototyping

Business Case  
Development

Technology  
Blueprint

SAP Leonardo  
Technologies



SAP Cloud Platform

Microservices | Open APIs | Flexible Runtimes | Integration

Multi-Cloud Infrastructure

SAP Data Center



# SAP Leonardo



## Innovate

With new capabilities such as **machine learning, Big Data, analytics, and IoT on SAP Cloud Platform**



## Integrate

**Modular capabilities** that are easy to buy, deploy, and consume; open and extensible with rich APIs

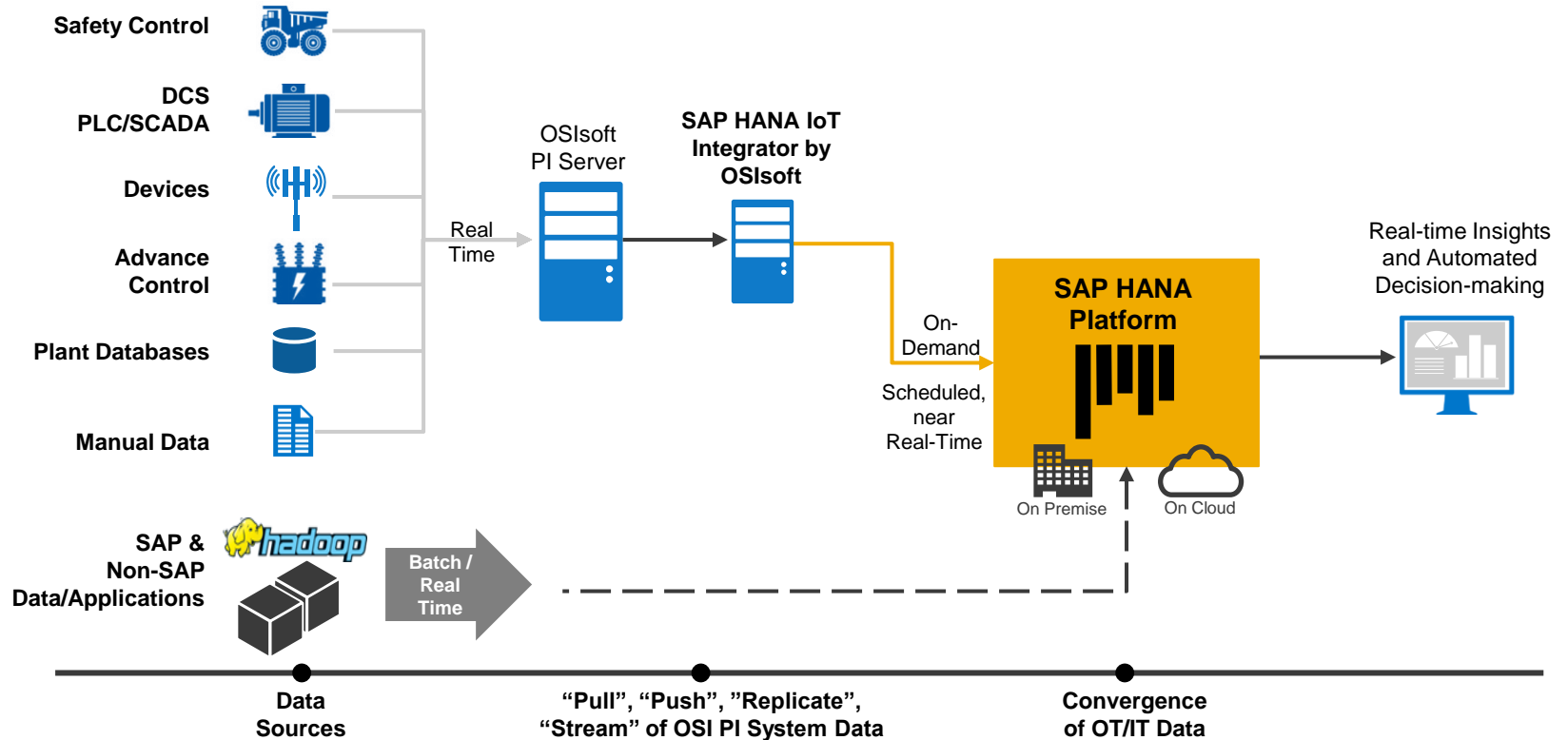


## Scale

Easily connecting innovation with existing and future **SAP and third-party** technologies, data, and systems across core and digital business



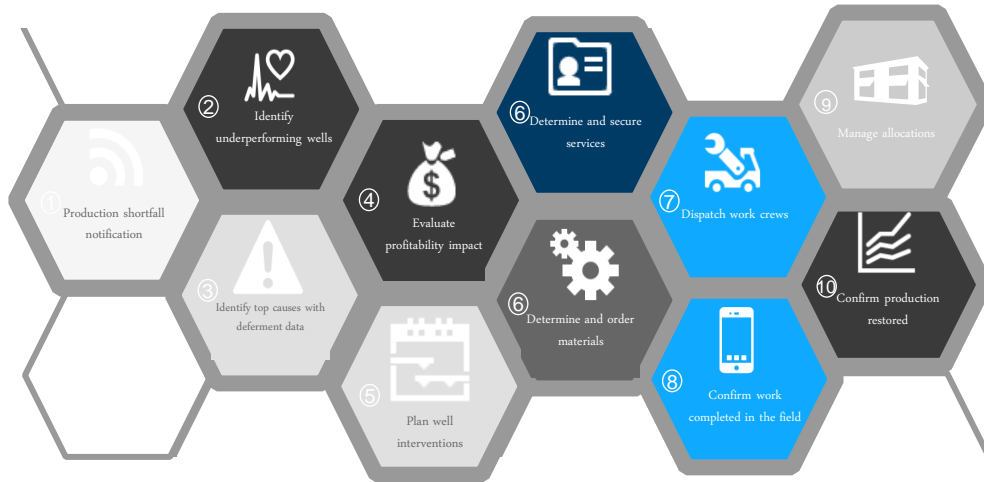
# Logical architecture



# From the wellhead to the service station

## Improving performance with intelligent information

### Digital Oil and Gas Scenario: Connected Oilfields



TIME



Suppliers collaboration  
business networks



Stakeholder experience



Digital core



Workforce engagement



Internet of Things

Value estimates

5-15%

Improved production rates

12%

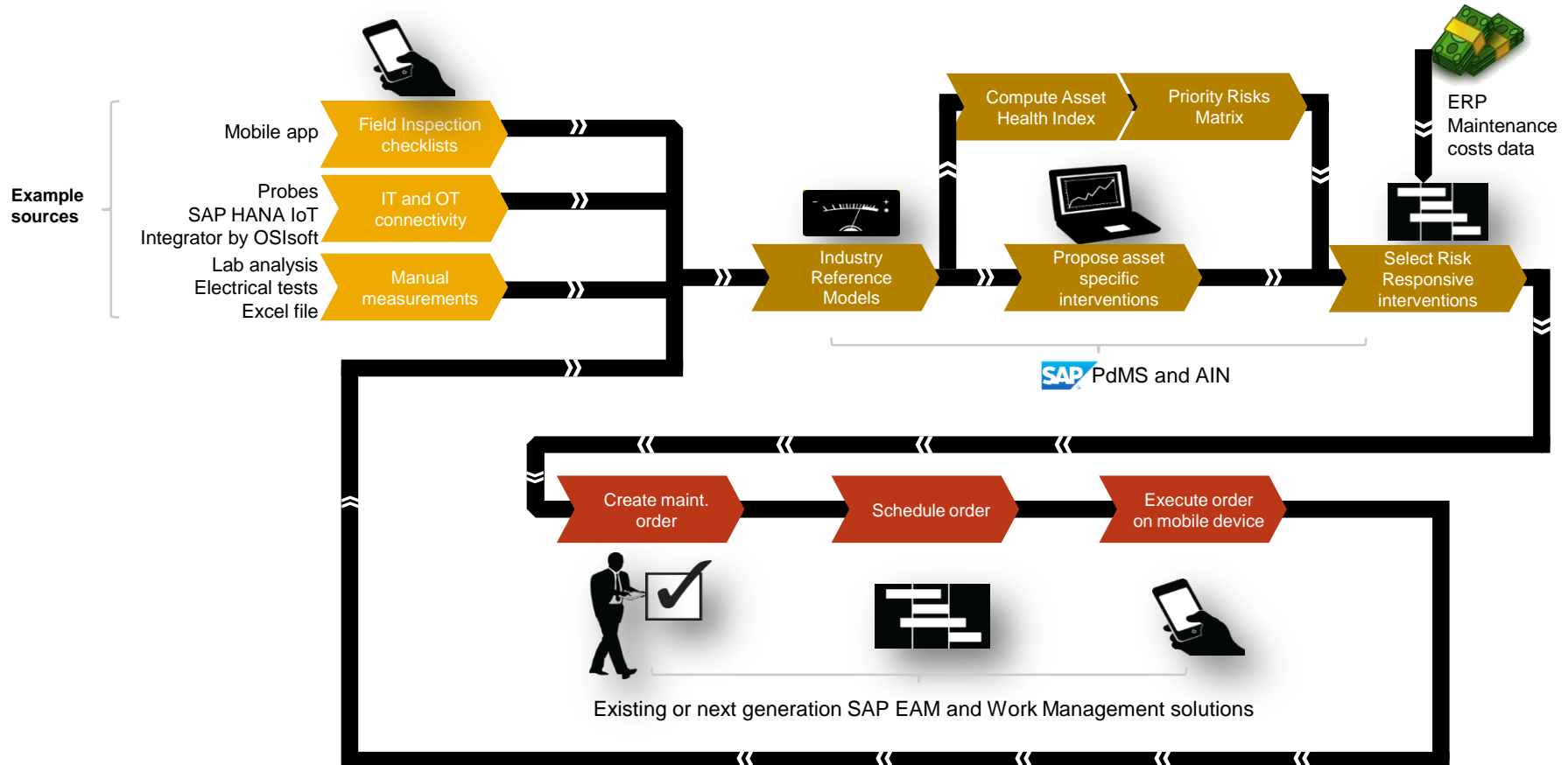
Reduced drilling costs

Lower

Deployment and integration costs

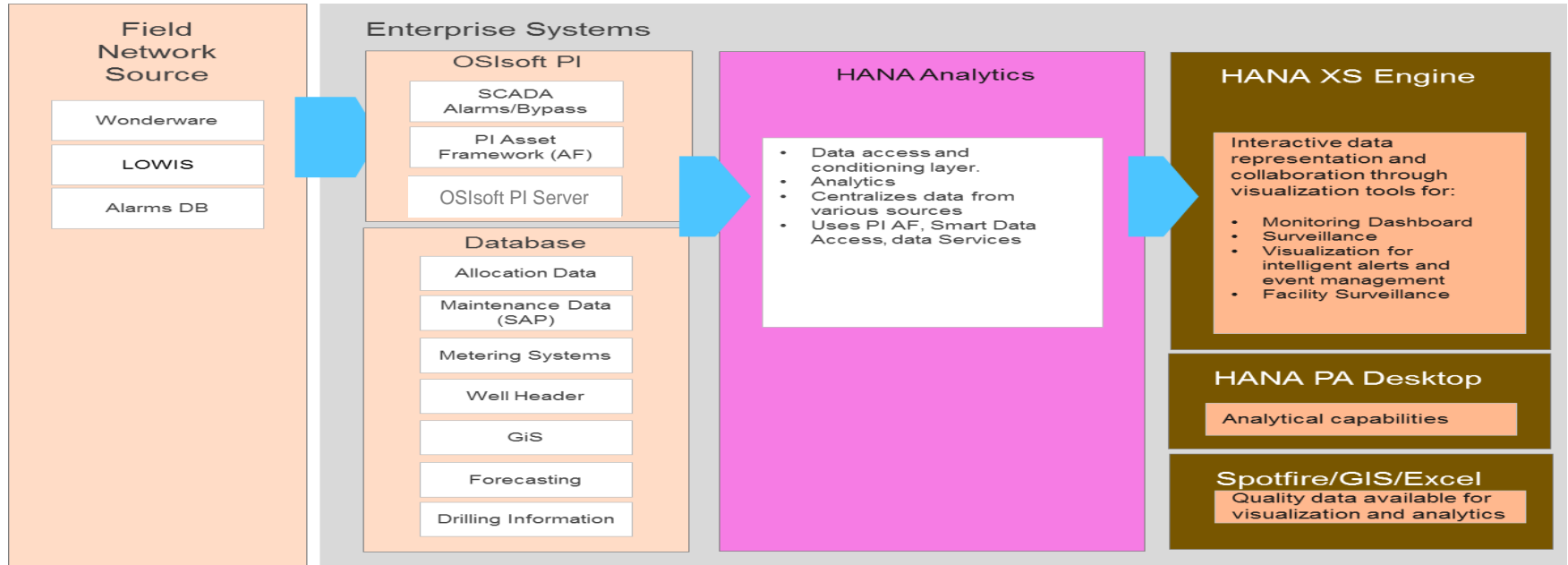
Source: SAP and Customer Business Case

# Unlocking the Value in Asset Management Driven by Analytics



# Enhance the Innovation Potential of the IoT Through IT/OT Convergence

## Creation of an Operational Data Store and Surveillance and Monitoring Use Case



1. Latent Information and lack of detail analysis due to data residing in different technical and business domains
2. Access to production data (pressures, volumes, etc.) from multiple systems in a timely fashion
3. Limited means to make decisions based on information, trust, business logic and collaboration across physical and organizational boundaries

# Enterprise Data Platform powered by SAP HANA and OSIsoft

## 1.) SITUATION BEFORE DIGITALIZATION

- Large amounts of data residing in silos: asset location, maintenance, ERP, and operational data all live in different SAP, OSIsoft and GIS systems and are accessed in unique ways.
- Uncertainty around which data set is most accurate and should be included for advanced analytics.
- Spreadsheets being used to prepare data and transfer it to another database where analytics can be done but this inefficiency causes delays in decision making.

## 3.) SITUATION AFTER DIGITALIZATION

- A unified Business Intelligence (BI) and Data Warehouse (DW) platform based on SAP HANA utilizing existing investments in OSIsoft PI Server and ESRI GIS
- SAP HANA available as single source of truth for reporting and analysis with automated data ingestion from OSIsoft PI Server.
- Near real-time reporting and analysis resulting in better decision making.
- Holistic view of asset and financial performance with drill down analytics enabling informed decisions.
- Collaborative SAP and OSIsoft data platform with near real-time predictive asset and maintenance analytics improved operating efficiencies.

## 2.) NEED FOR CHANGE

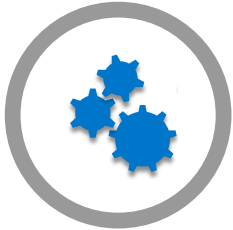
- Siloed data in different systems only allowed for reactive or scheduled-based approach to maintaining wind turbines leading to operating inefficiencies.
- Due to the lack of a holistic data set of wind-turbine assets, asset profitability analysis was not possible.
- Time delays caused by manual efforts needed to create collaborative reports including data from all sources.

## 4.) TANGIBLE RESULTS

- 92% reduction in time it takes to run curtailment reports. This only takes 12s now.
- To pull operational data from OSIsoft PI Server into spreadsheets to later combine with other data sets from SAP and non-SAP systems used to take weeks. Now it takes minutes.
- With a combined platform based on SAP HANA, a 86% reduction in database size was achieved: 790GB to 110GB.
- Further business benefits around asset utilization, profitability and maintenance savings are being assessed as the project continues.

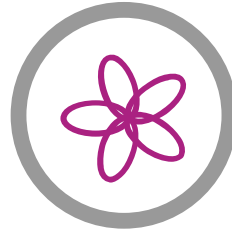
# SAP Leonardo Foundation

## Connect



**Scalable ingestion** of IoT data, **broad device connectivity** and **large scale device management**

## Enable



Microservices **automate** big data storage, **secure** access and **organize** data with an extensible thing data model

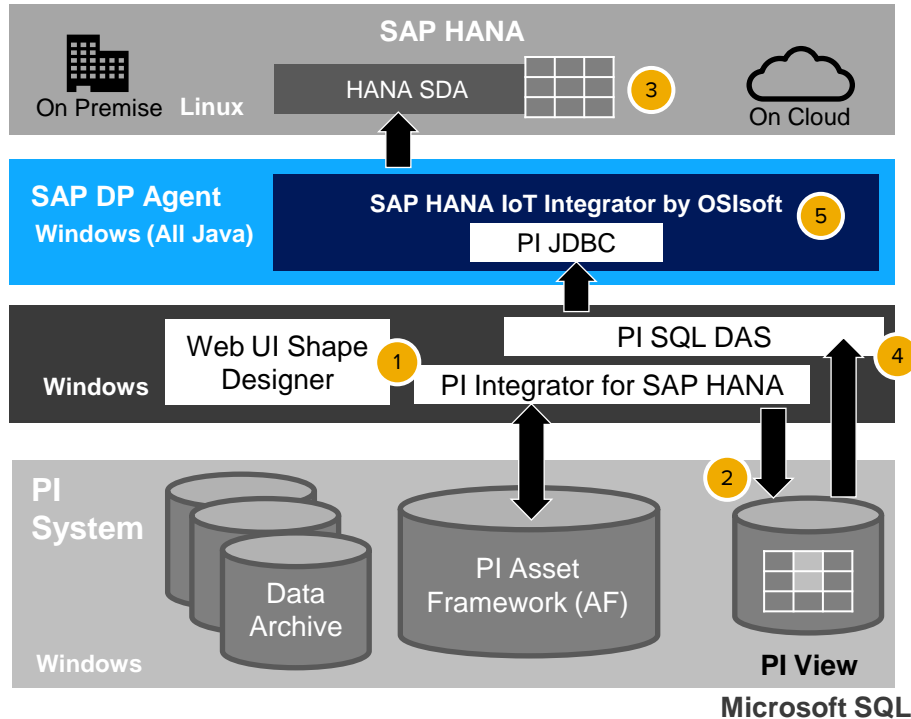
## Build



IoT application development tools drive **scale** and **consistency** and achieve value **faster**

# Virtualization of PI System data (with HANA IoT Integrator)

How the solution works



1

User creates PI View in Web UI Shape Designer via PI Integrator Framework

2

PI View definition is stored in PI System (AF). PI View data is stored in optimized format in AF-managed SQL Server

3

SAP HANA user configures virtual tables in SAP HANA Studio using SAP HANA SDA and SAP HANA IoT Integrator by OSisoft

4

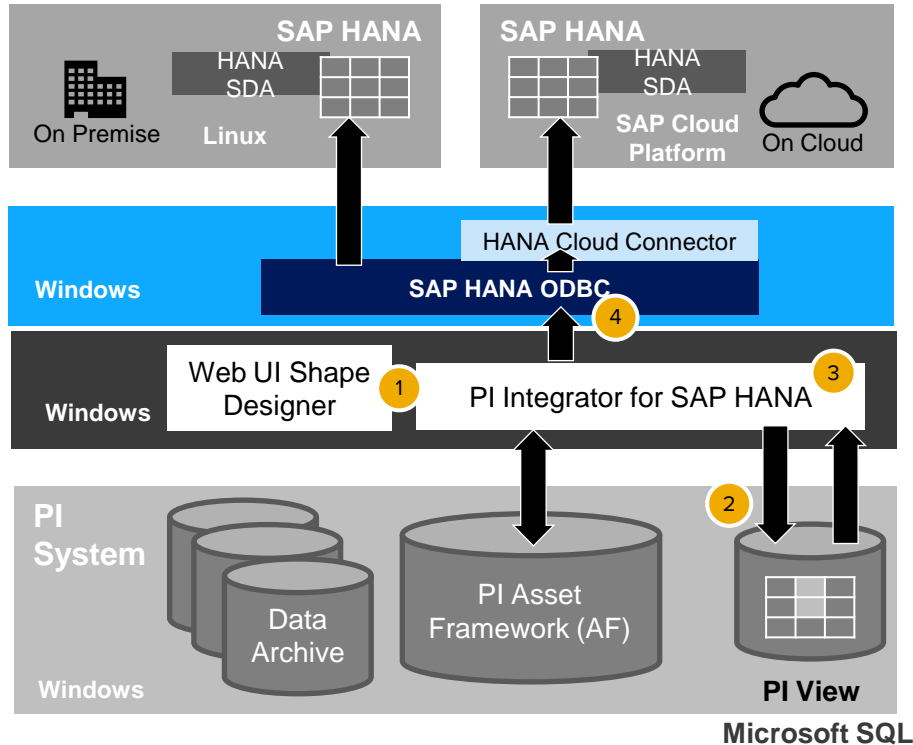
PI SQL DAS controls access to PI Views

5

User in SAP HANA retrieves data from PI View located in SQL Server via SAP HANA IoT Integrator and PI JDBC

# Publish (push) PI System data (with HANA ODBC)

## Solution pre-requisites



1 User creates PI View in Web UI Shape Designer via PI Integrator Framework

2 PI View definition is stored in PI System (AF). PI View data is stored in optimized format in AF-managed SQL Server

3 User selects from PI View what to publish (push) to SAP HANA ODBC

4 PI View data published to SAP HANA ODBC is either one-time or continuous publication (push)

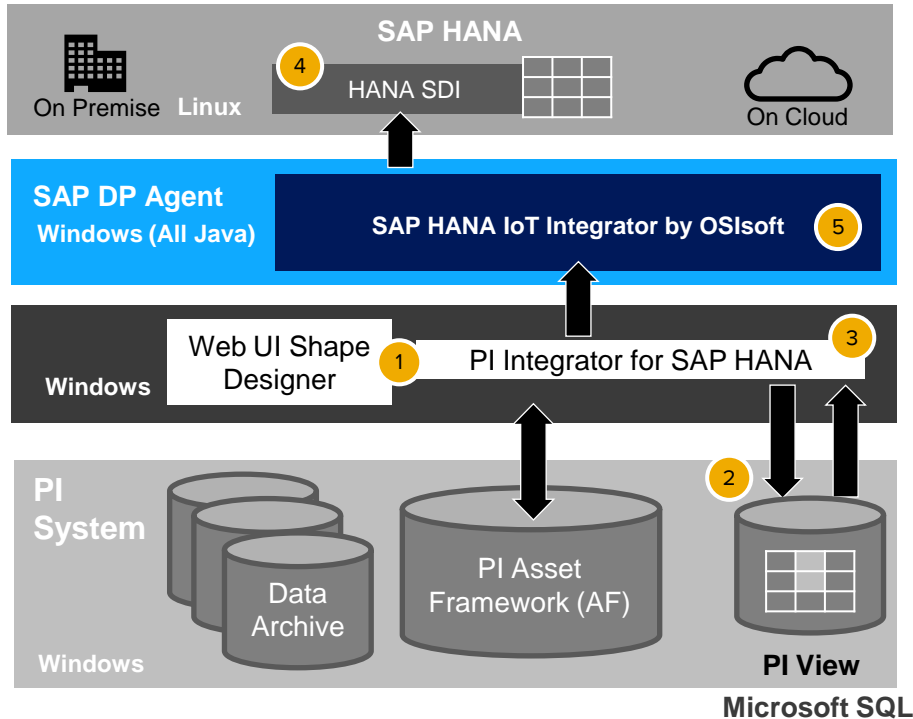
### Notes:

- SAP HANA IoT Integrator by OS/soft must be licensed in order to use PI Integrator for SAP HANA
- HANA Client (ODBC) must be separate from HANA server



# Replicate (push) PI System data (with HANA SDI)

How the solution works



1

User creates PI View in Web UI Shape Designer via PI Integrator Framework

2

PI View definition is stored in PI System (AF). PI View data is stored in optimized format in AF-managed SQL Server

3

PI Integrator sets up to write PI View data into SAP HANA via the SDI Adaptor

4

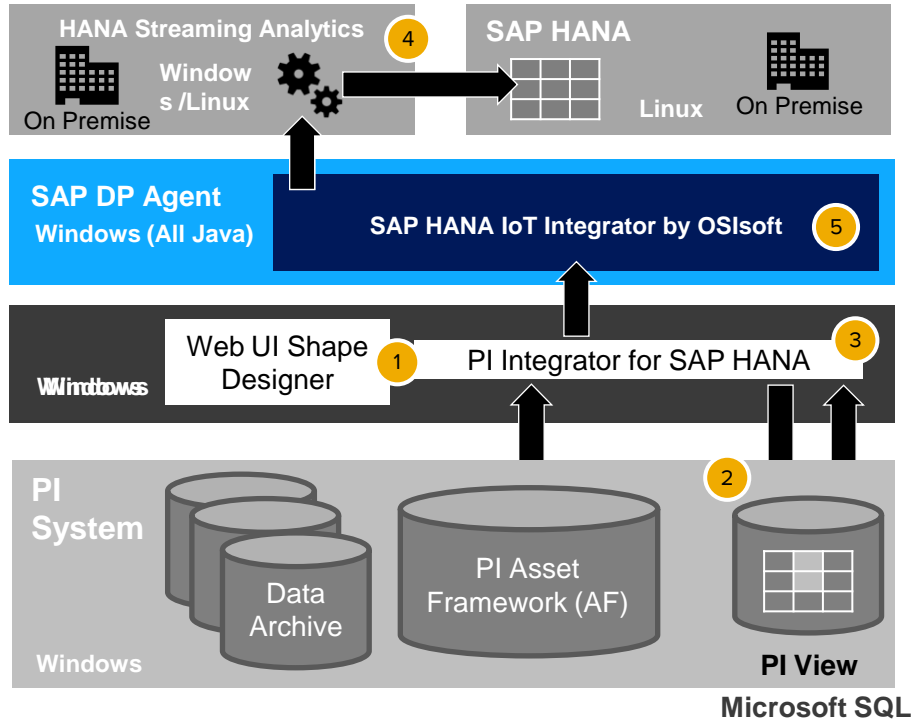
Administrator creates replication task in HANA SDI for the PI View data

5

Once replication is executed, PI View data is replicated (via HANA IoT Integrator) into HANA as tables

# Streaming of PI System data (with HANA Streaming Analytics)

## Solution pre-requisites



1

User creates PI View in Web UI Shape Designer via PI Integrator Framework

2

PI View definition is stored in PI System (AF). PI View data is stored in optimized format in AF-managed SQL Server

3

PI Integrator sets up to stream PI View data via the SA Adaptor into a (staging) table

4

Administrator creates SA project reading from (staging) table into HANA

5

On executing streaming project, PI View data is streamed through SA (via HANA IoT Integrator and PI JDBC) into HANA

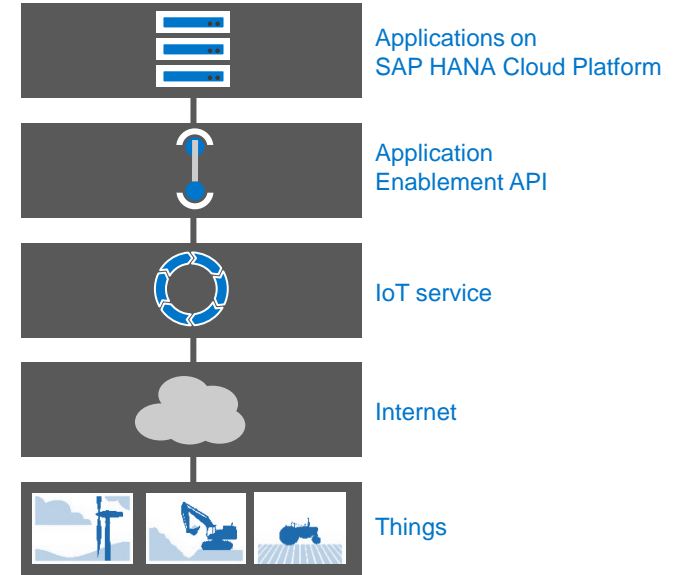
### Notes:

- Not certified for HANA database on SAP Cloud Platform

# Connect IoT Devices with SAP Leonardo Technical Services

## Key Capabilities

- ❑ Lifecycle management at scale for IoT devices from onboarding to decommissioning
- ❑ Securely connect to remote devices over a broad variety of IoT protocols
- ❑ Collect and process sensor data at scale already at the edge or in the cloud and store it on SAP HANA Cloud Platform for use by other applications

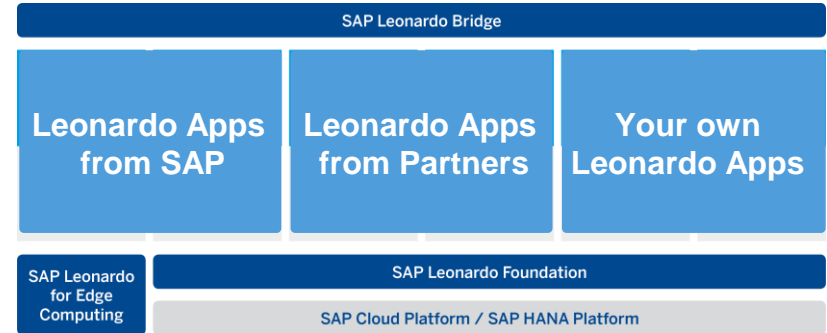


# Enable an “App” economy for IoT scenarios

SAP Leonardo Foundation as the **integration layer** across different apps



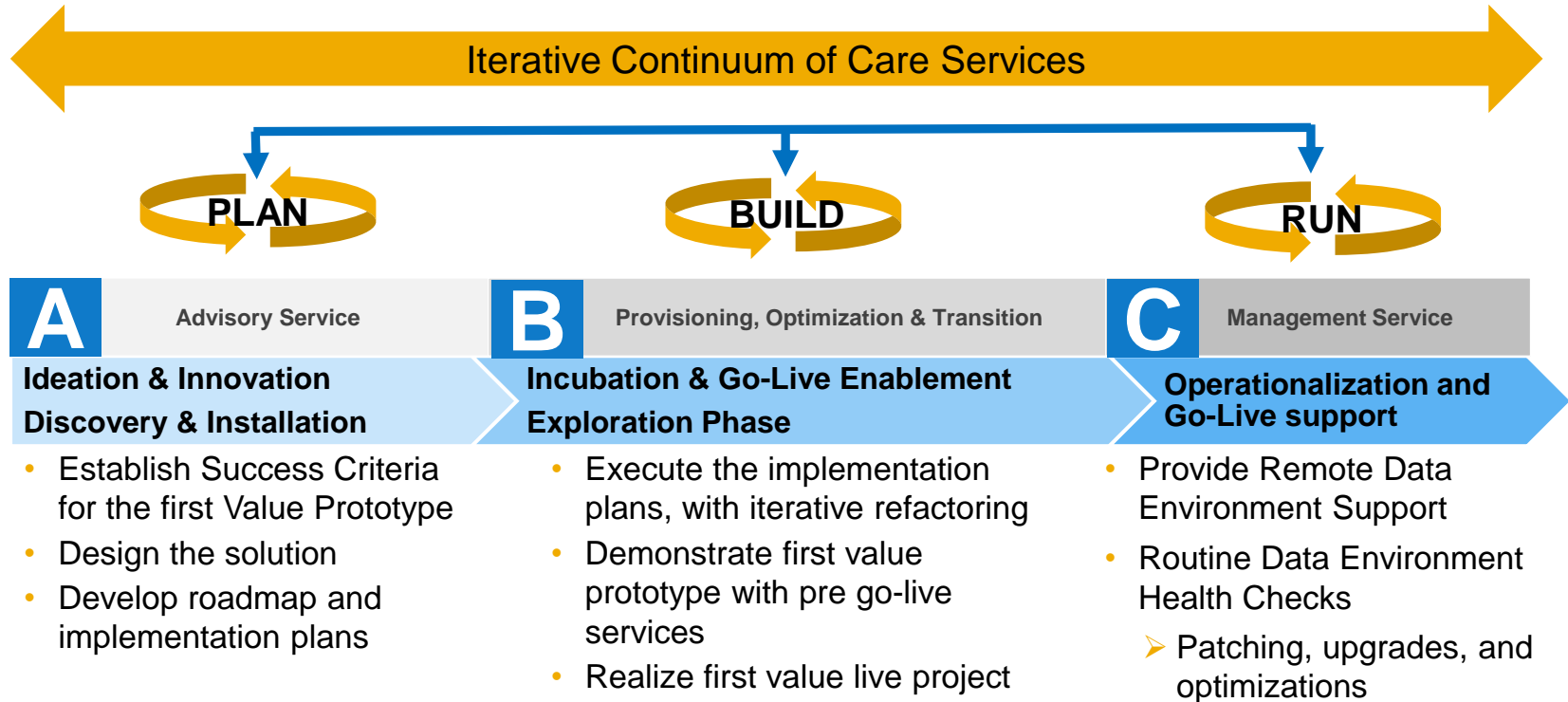
Develop, Deploy and use **Apps from various sources** on the same data and same semantic structure



**SAP Leonardo Foundation enables an App economy for IoT** like iOS and Android in the mobile space



# SAP and OSIsoft Integrator Services Enablement (ISEP) Phases and Outcomes



## Frank Ruland

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Global VP and Head of Industry  
Ecosystem Energy and Natural  
Resources

SAP SE



## Questions

Please wait for the **microphone** before asking your questions

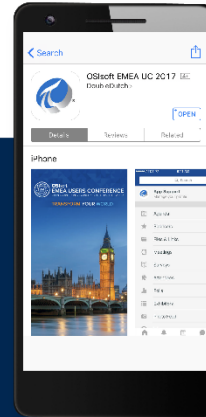


State your **name & company**

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감사합니다

Danke

谢谢

Merci

Gracias

**Thank You**

ありがとう

Спасибо

Obrigado

Start your innovation journey with IT and OT in mind!