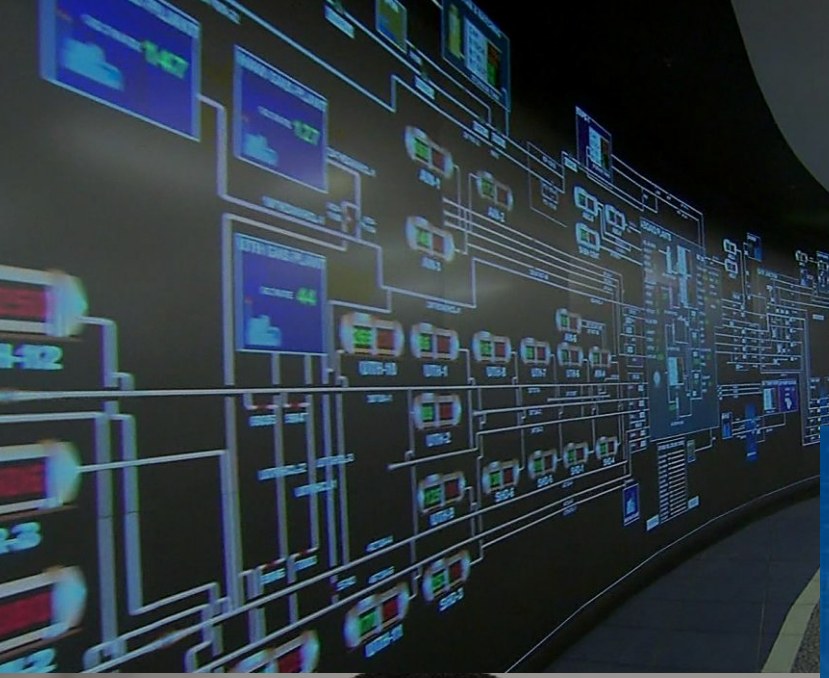
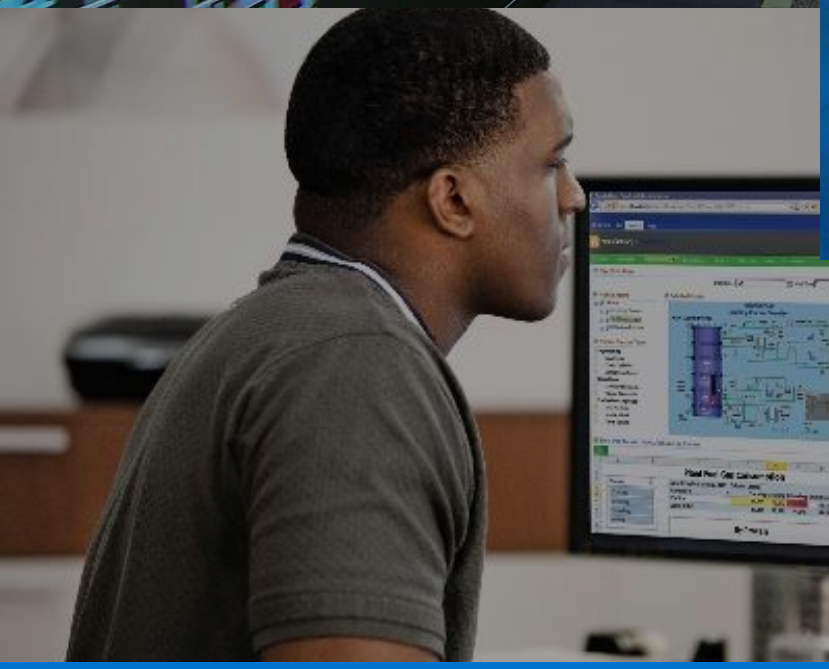


TRANSFORM YOUR WORLD



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We believe People with Data can Transform their world

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1.5B Sensors

>125 Countries

17,000 Sites

Technology Drivers	2020 Adoption	2020 $ Market
IIoT	50B devices	$25B
Big Data	15-20% CAGR	$61B
Security	5% CAGR	$28B

M2M 26B Units

6.6 Connected devices/person

$36B Remote healthcare

200M Smart Homes

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Opportunity: Transforming the Value of Data

1 | Data
Real-time Feeds

Boiler-209.Fuel Gas Flow DC.Srv01R 94:GRDIDX.Tr igger AC09.Power
GE01_DT 409510395_Wind Speed QI-109 GE01_DT Cooling Fan-711.Feed Rate
DM-05:BW.R DC.SJ.C1.Z1.R1.Rk06.S2.O03.PWR QI-111 FinalProductBin.On
94:GRDIDX.ProdID Boiler-209.Fuel Gas Flow fic1001.C
FR5001 1-8.Net Volume Coal Motor Load 02F100.TOT.EV 3LBA32CT001-
DC.SJ.PUE TI-102 DC.Zero DY-108 DC.SJ.C1.Z3.R3.PDU1.PF GE01_A_DT
403511195_Wind Speed DC.Srv01R Boiler-125.Fuel Gas Volume
1-16.Net Volume CB1992_MS 0_CMP_FLOW_TOTAL GE02_Energy
Anacortes Refinery.Alkylation.Asset Problems B210_FG005.KPIExcursion
AlarmTest.Input.Float32.1 AQUA2-TI-201.PV DC.SJ.SiteRealTimeITLoad.PWR
FT9001
FI-101 bf5e1d1d-39c9-4b5b-b3d3-c2ce05fa3a26 DM-05:BW.R AT401
0_CLR_FINAL_OUT_B_TMP F506_E990 339511775_Clear Sky Global Horiz GE01_DT
D-110.Tank Pressure.PV Boiler Feed Pump #1 FT9001
GE01_CON AlarmTest.Input.Float32.1 FIC-144 02F100 fasttag
FI-151 0_ENG_AUX_STS DC.C2Z1.Pwr.Ripple GE01_A_DT
02F102.1HRAVG BGT001 PI-111 facility_output FI-111
GE05_Energy C1:14AT5 1-8.Net Volume
AC03.Air Flow FeedBin.Cmt Coal Motor Load
Boiler Cold Reheat Pressure 02F100.TOT.EV
B737_FG117 DC.TimeLoad 03LBA32CT001-2
D-110.Tank Pressure.PV DC.SJ.ITLoad.PWR
GE04_DT QI-121 GE03_V_WIN TI-145 FR2001
DC.Rk07R DC.Srv06R TI-178 GE04_OS
GE04_Energy TI-121 FT9001 FT9001 FT9001
FAC.OAK.Power-Kh-Val.PV FR5001 AF_NOISE
FeedBin.Cmt DY-131
DC.Zone1.Number DC.SJ.PUE
fic1001.C
DailyTrigger GE02_OT
FrqPrbCost_ER GE01_DT

2 | Information
Real-time Decision Support

Weather Conditions

Relative Humidity:
34% Current Temp: 85
°F High: 92 °F
Low: 57 °F
Wind: 8 mph/N

Energy Efficiency

Downtime

Total Production

Crude Furnace

Draft Pressure: -0.5 WC
Stack Temp: 316 °F
Oxygen: 2.5%
Firebox Temp: 860 °F
Outlet Temp: 840 °F Cold
Oil Velocity: 6 ft/sec

3 | Intelligence
Business/Operation Analytics

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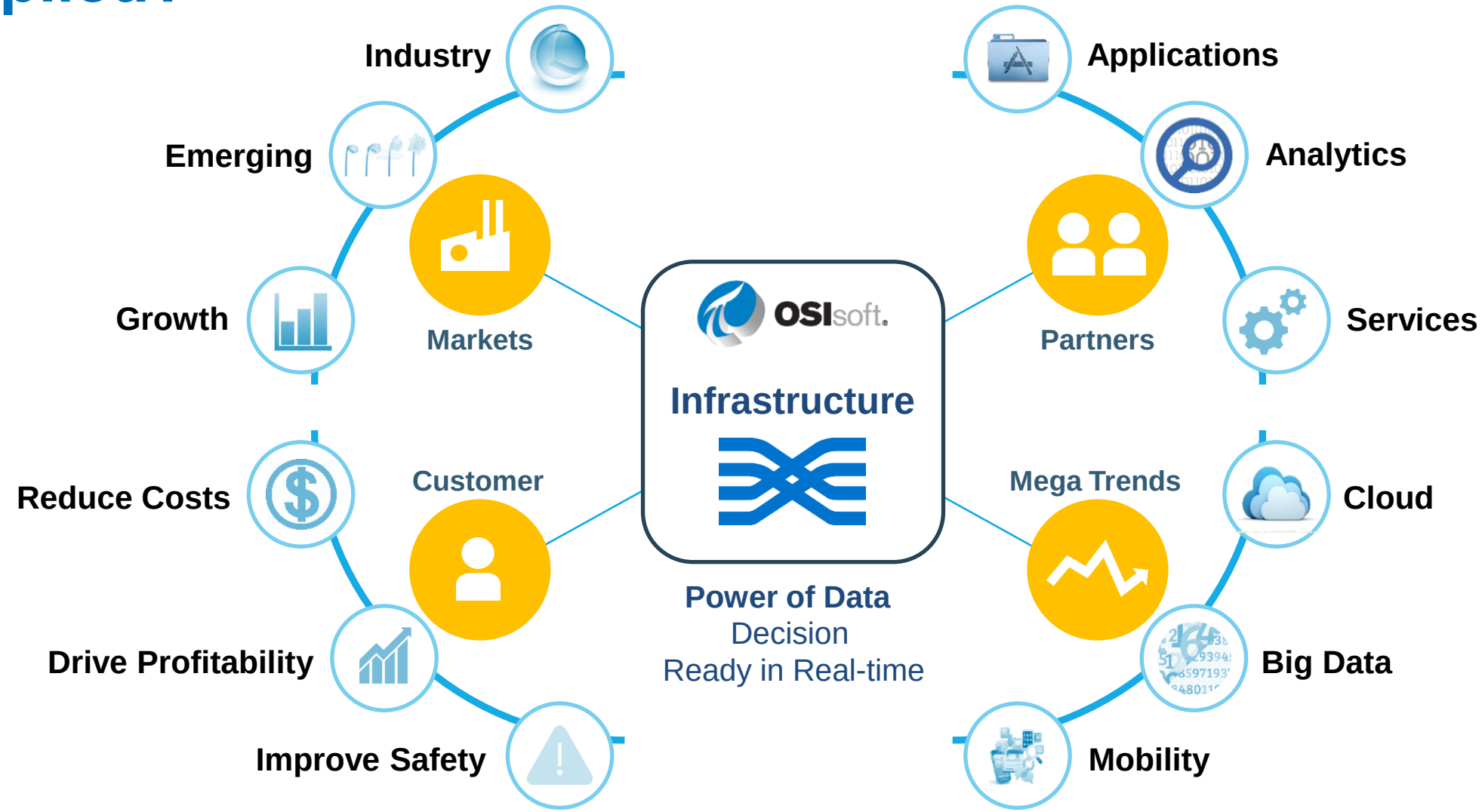
Infrastructure is at the Core of our Story…How is it Applied?



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Data Infrastructure: For Your Journey

Processing

Process Efficiency

Maintenance

Asset Health

Equipment

Utilities

Energy

OSIsoft.

Infrastructure

Quality

Production

3rd Party Services

Regulators

Facilities

Safety & Security

Regulation

Environment

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Data Infrastructure:
An Agent for Business Transformation

Process Efficiency

Asset Health

Energy

OSIsoft.

Infrastructure

Quality

PETRONAS

Xce

LCO

lad

janssen

5 less plant shutdowns

$12M/yr/mine
O_2 savin

ved &
errors

$5-40M per

Saved 640M
ters water

1000+ less paper documents

Safety & Security

Regulation

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The Challenge

EMERSON. YOKOGAWA Rockwell Automation Schneider Electric GE SIEMENS ABB Honeywell

Executives

Engineers **USERS** IT/Data Scientists

Operations

waygum

Sensors Devices Assets Plant Enterprise Services

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Data Infrastructure for Digital Transformation

BIG DATA

Application Ready
Real-time Decisions
IIoT for 35 Years
Operational Intelligence

IoT

EMERSON. YOKOGAWA Rockwell Automation Schneider Electric GE SIEMENS ABB Honeywell

Data Infrastructure

QUALCOMM CISCO intel DELL

SMART MACHINES

Sensors

Actuators

Intelligent Motor Control

Controllers

Terminals

SMART DEVICES

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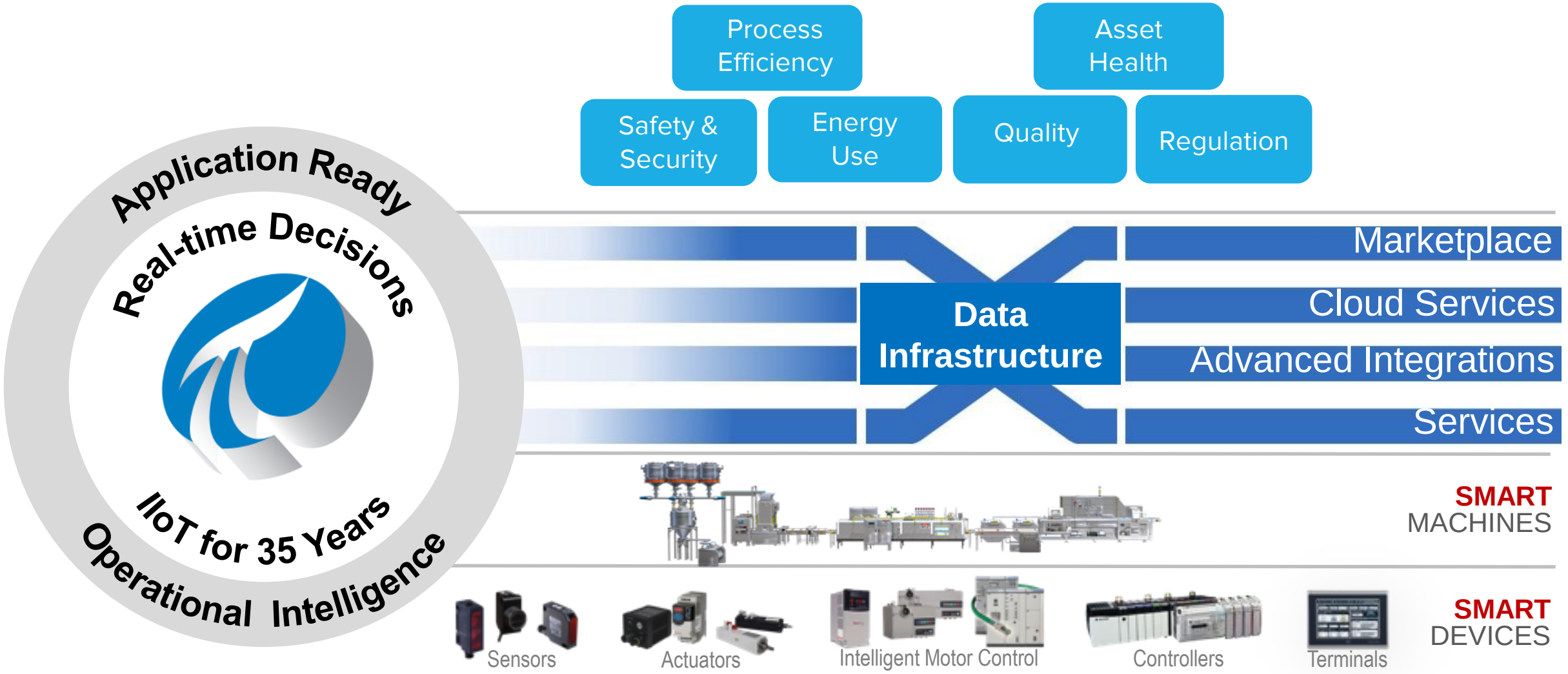
OSIsoft Initiatives for Business Transformation



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Partner Ecosystem to Support Transformation

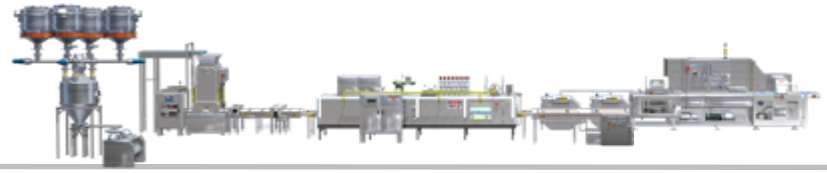
Application Ready
Real-time Decisions
IIoT for 35 Years
Operational Intelligence

Outotec · Optimate · POWER FACTORS · ELEMENT ANALYTICS · Quarcum Technologies · SAP HANA · SPS Data First · Seeq · radix · CTC · WIPRO · DIRECT automation · Bharat Light & Power · esri · EXELE · ProcessPlugins · Transpara · INDUSTRIAL evolution · RITECH SOFTWARE · TIBCO · doble · REVISYS · BLACK & VEATCH · eMotorWerks · SETPOINT

Marketplace

Cloud Services

Data Infrastructure



SMART MACHINES

Sensors

Actuators

Intelligent Motor Control

Controllers

Terminals

SMART DEVICES

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Unleash your Infrastructure with the PI System

Enhance your Intelligence with PI Advanced Integrations

Advance Your Ecosystem with OSIsoft Marketplace

Expand Your World with OSIsoft Cloud Services

Accelerate Your Transformation with OSIsoft Services

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Unleash Your Infrastructure with the PI System

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Long Term Strategic Partnership – Est. 2006

Rockwell Automation

OSIsoft

Rockwell Automation Encompass™ Product Partner Global

- Leadership in Automation and Information Solutions
- Integrated Control and Information Platform **powered by OSIsoft**
- Global Solution Provider
- Scalable offering from products to solutions

- Enterprise Data Infrastructure
- Performance Management Software Products
- Initially a Technology Provider, now **Global Encompass™** Partner
- Enterprise selling – value of data driven decision making

Market leaders joining together to provide winning solutions

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Transactional data: orders, supply network, product design …

ERP FINANCIALS HR LOGISTICS QUALITY CUSTOMERS …

IT

CONVERGENCE

Rockwell Automation

OT

Real-time data: **CONTROL**, **SAFETY, SECURITY** + alarms, events, states, energy, diagnostics, …

SENSORS, ACTUATORS CONTROLLERS MATERIAL & TRANSPORT MACHINES & EQUIPMENT LABELERS & PRINTERS …

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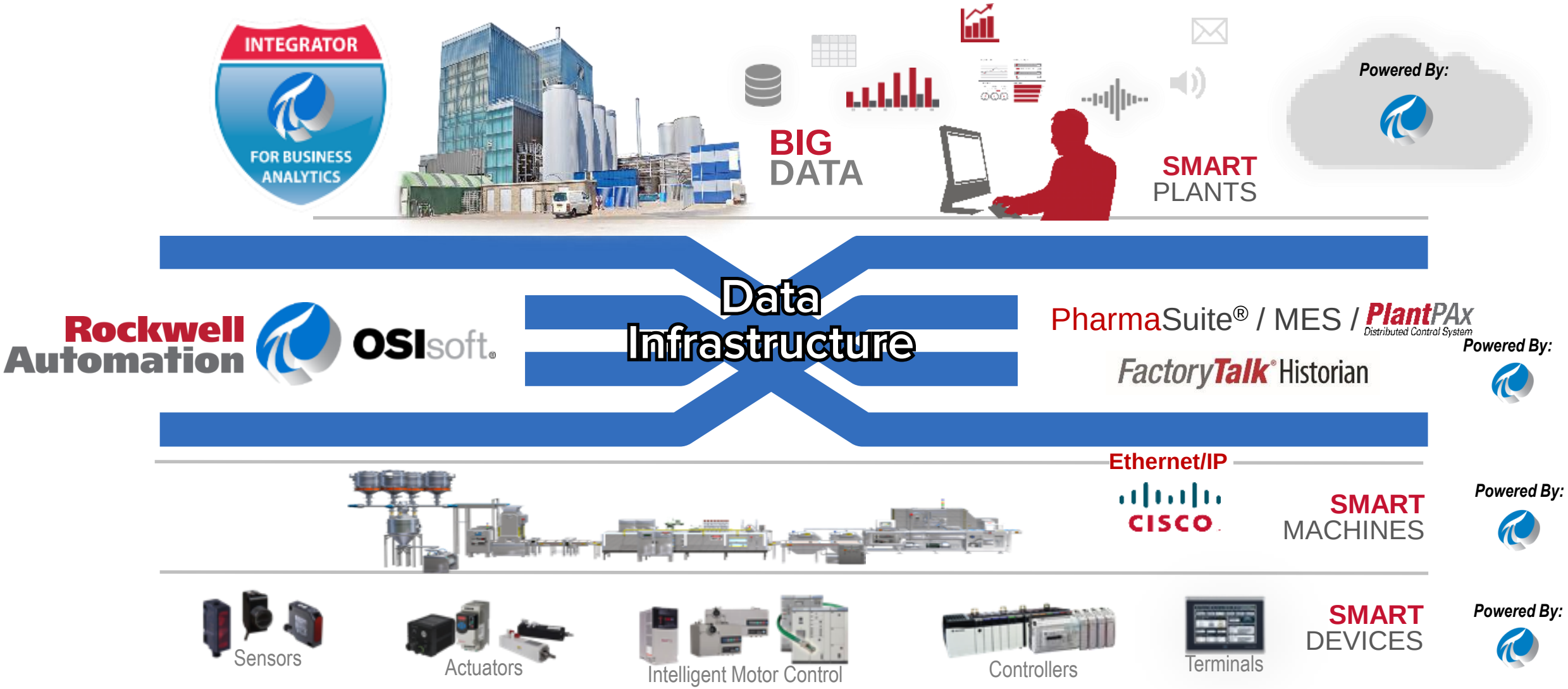
OSIsoft & Rockwell Automation:

Enabling an Agile Digital Transformation Strategy



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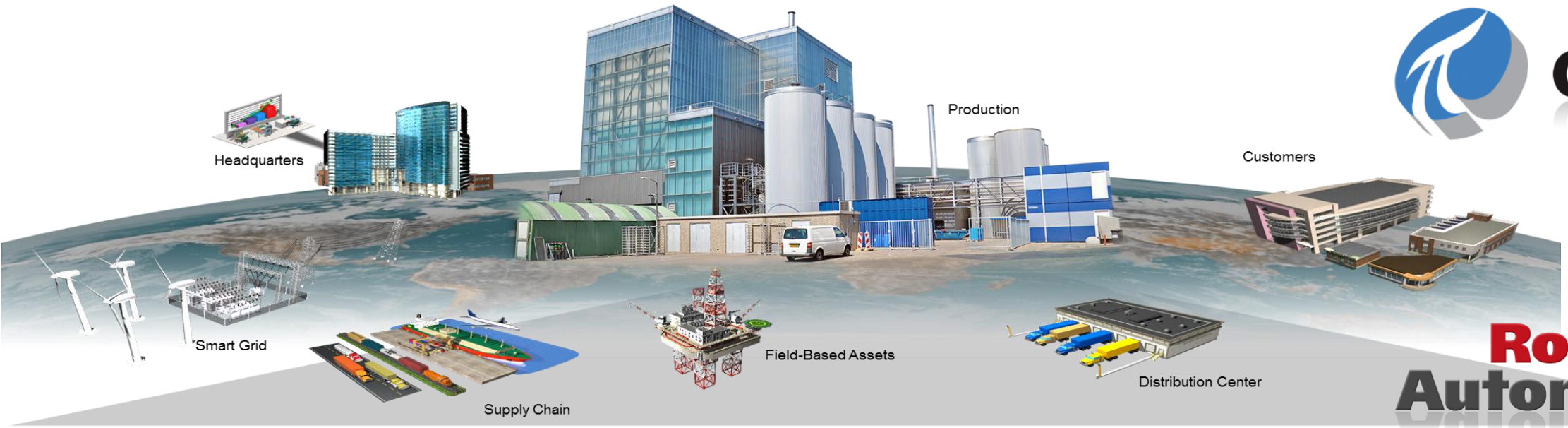
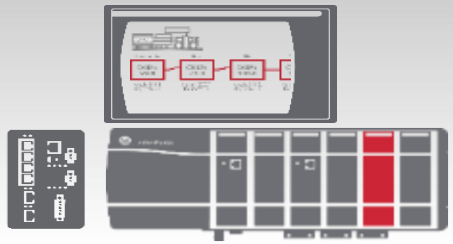
Integrated Control & Information:
Our Core Platforms Enable The Connected Enterprise



OSIsoft

Rockwell Automation



Integrated Architecture

Intelligent Motor Control

Solutions & Services

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"The Rockwell Automation and OSIsoft combination brings together the best of industrial and enterprise data management. The infrastructure seamlessly leverages the company's existing investments at a plant and enterprise level."

ENTERPRISE AGREEMENT

Deployment of standard infrastructure in

21 NORTH AMERICAN BREWERIES

AB InBev

OSIsoft. Rockwell Automation

"We believe North America will be the first of 6 Zones to deploy this architecture across AB-InBev, worldwide"

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OSIsoft Business Impacts

Process Efficiency

Asset Health

Safety & Security

Energy Use

Quality

Regulation

ptc

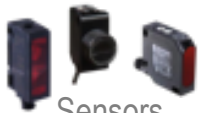
Data Infrastructure

FLOWSERVE

CAT

SMART MACHINES

NATIONAL INSTRUMENTS™


Sensors

Actuators

Intelligent Motor Control

Controllers

Terminals

SMART DEVICES

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Global Process Industries

Poor Maintenance +
Unscheduled Shutdowns

$20B USD

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FLOWSERVE®

- 16,000 Employees
- $5B Annual Revenue
- 220+ Years in Business

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Partnering for Innovation

Industry leaders integrating end-to-end tools from sensors to enterprise.

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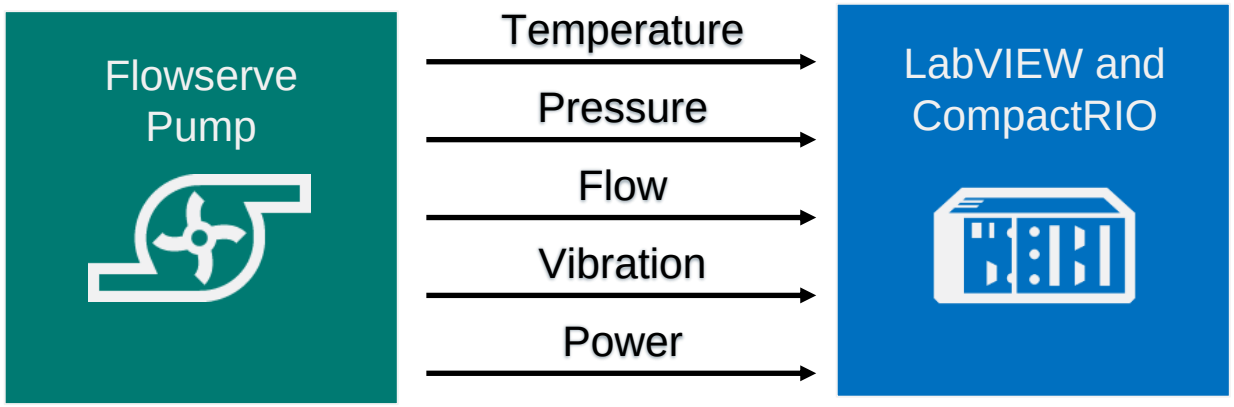
System Architecture



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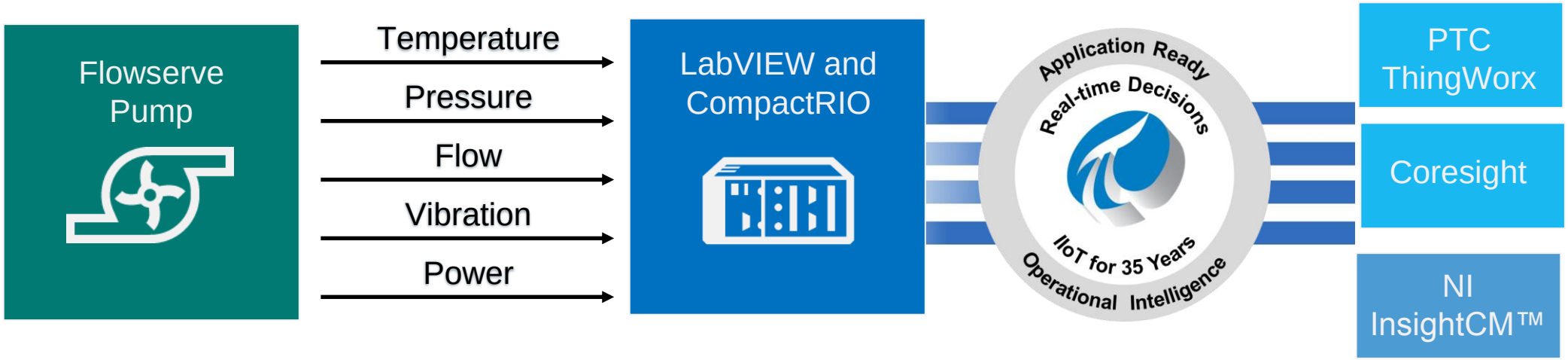
System Architecture



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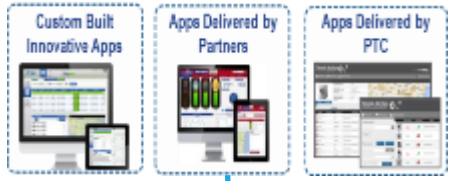
360 Degree Electric Power Solution Vision

Enterprise Data Hub Integration

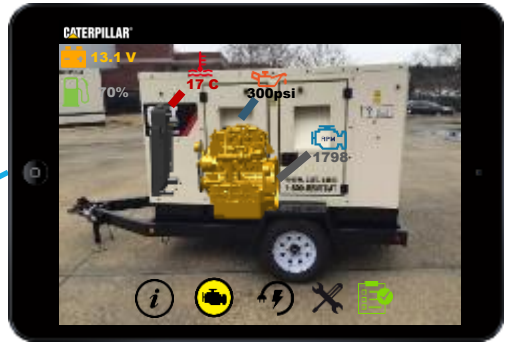
BIG DATA ANALYTICS

BUSINESS ENTERPRISE SYSTEMS

Dealer/Customer/CAT Apps



Augmented Reality Service & Inspection



Application Ready Real-time Decisions IIoT for 35 Years Operational Intelligence

Remote Diagnostic & Service

Digital Twin Simulation & Analytics

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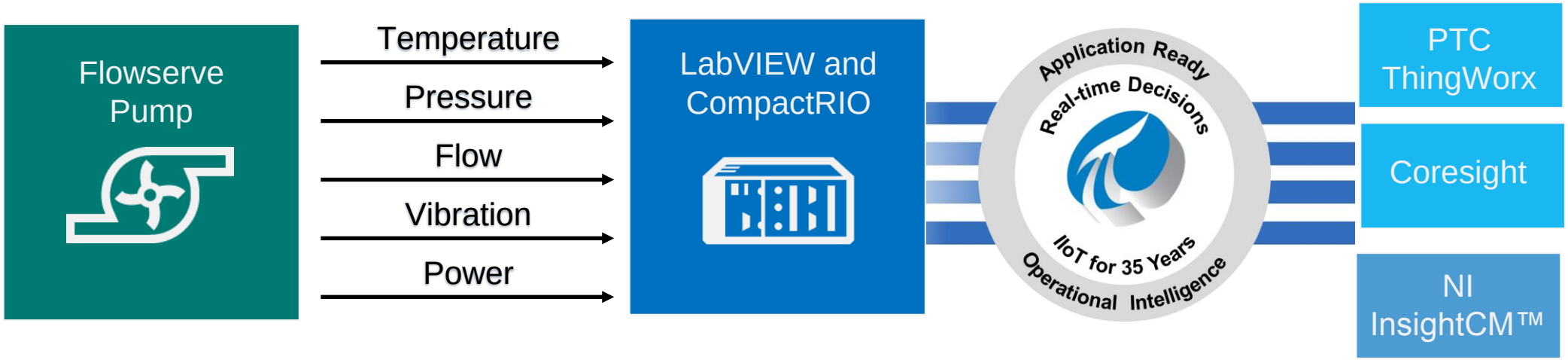
System Architecture



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OSIsoft Business Impacts

Process Efficiency

Asset Health

Safety & Security

Energy Use

Quality

Regulation

ptc

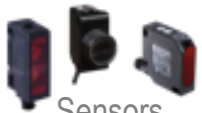
Data Infrastructure

FLOWSERVE

CAT

SMART MACHINES

NATIONAL INSTRUMENTS™


Sensors

Actuators

Intelligent Motor Control

Controllers

Terminals

SMART DEVICES

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Enhance Your Intelligence with PI Advanced Integrations

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Evolving Data Goals: PI Integrators

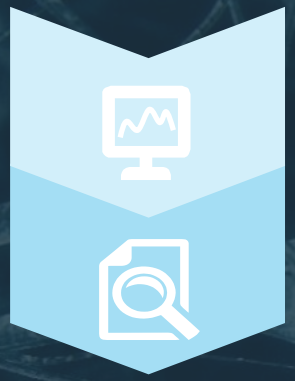
Real-Time Decision Support (OT)

Monitoring

Real-time visibility

Process Optimization

Real-time and historical view across all assets



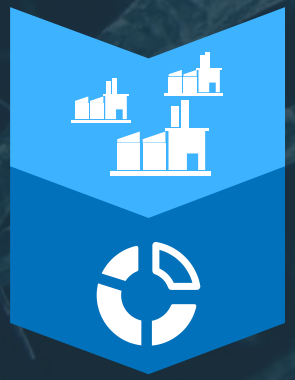
Enterprise Analysis

Benchmarking

Fleet-wide performance comparison

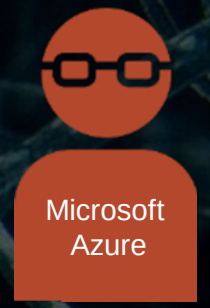
System Optimization

Combining data sets for system intelligence

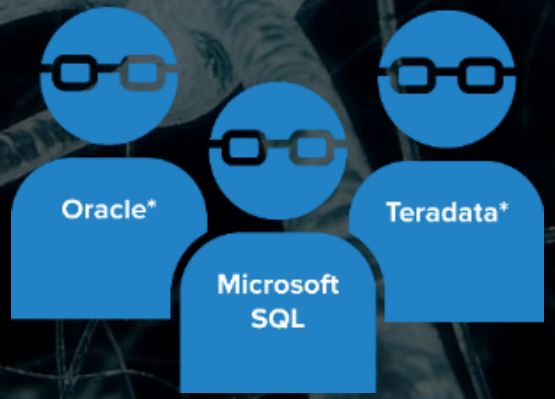


BI Edition

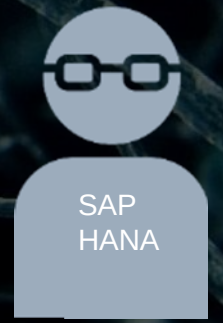
…for Azure



Data Warehouse Edition



…for SAP HANA



…for ArcGIS

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Why integrate?

- OT has a lot of information that can be used by management
  - (almost) Real-time access to plant data
  - Plant availability & cause of downtime
- Advanced Maintenance techniques
  - Maintenance analysis (why did it fail?)
  - Condition-based maintenance
- PI System can serve as the single repository for IOT to all applications
  - Fast and robust architecture
  - Can feed into different applications

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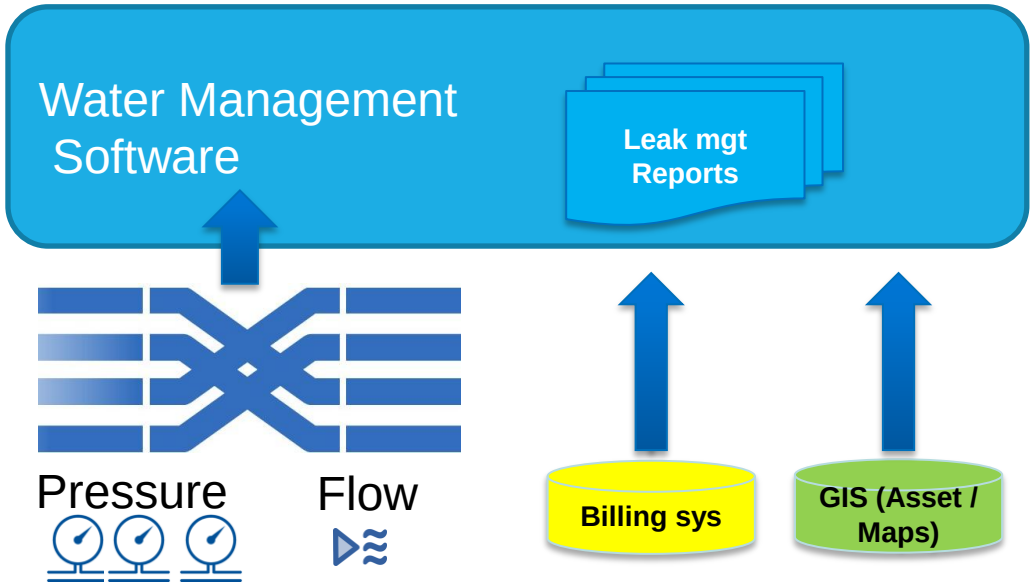
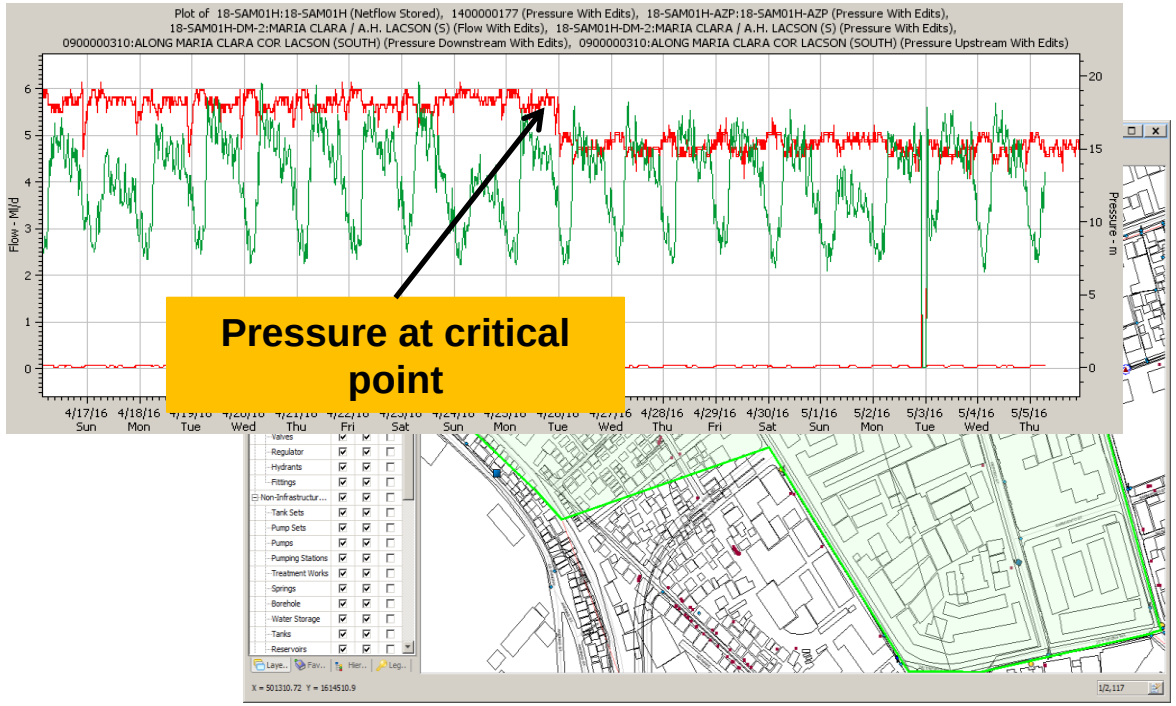
Example 1

- Analysis systems
  - Leak analysis: contrasts OT with IT data





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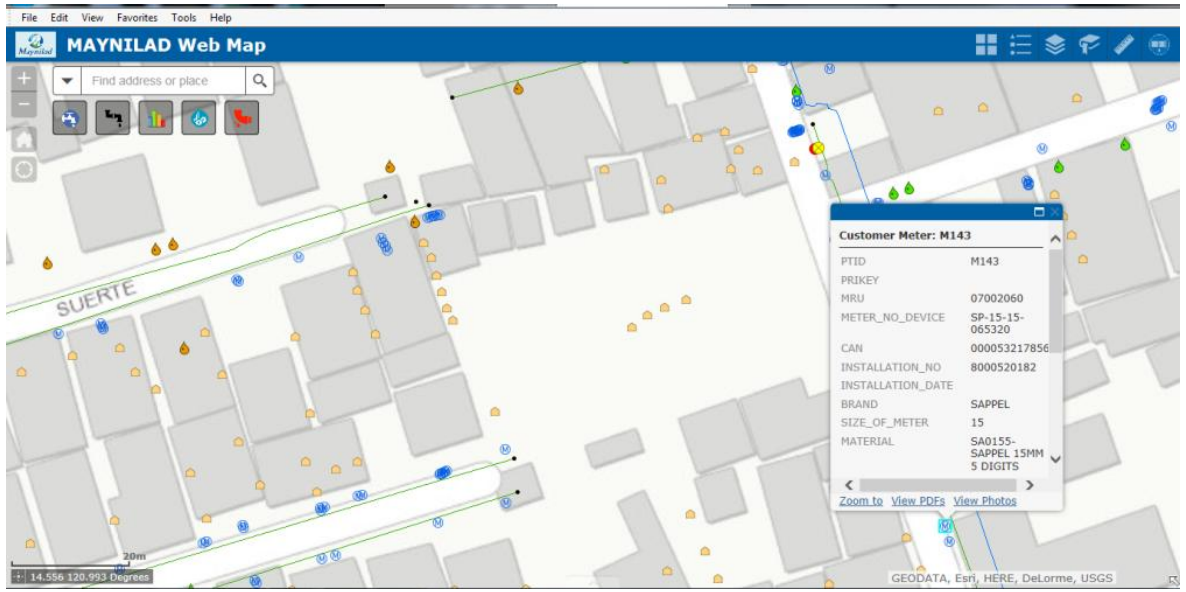
Some examples

- Condition Based Maintenance
  - Trigger alarms when conditions are met
  - Motor winding temp, bearing vibration, high current
  - Emails when conditions are met
- Visualization of IOT

Data on GIS



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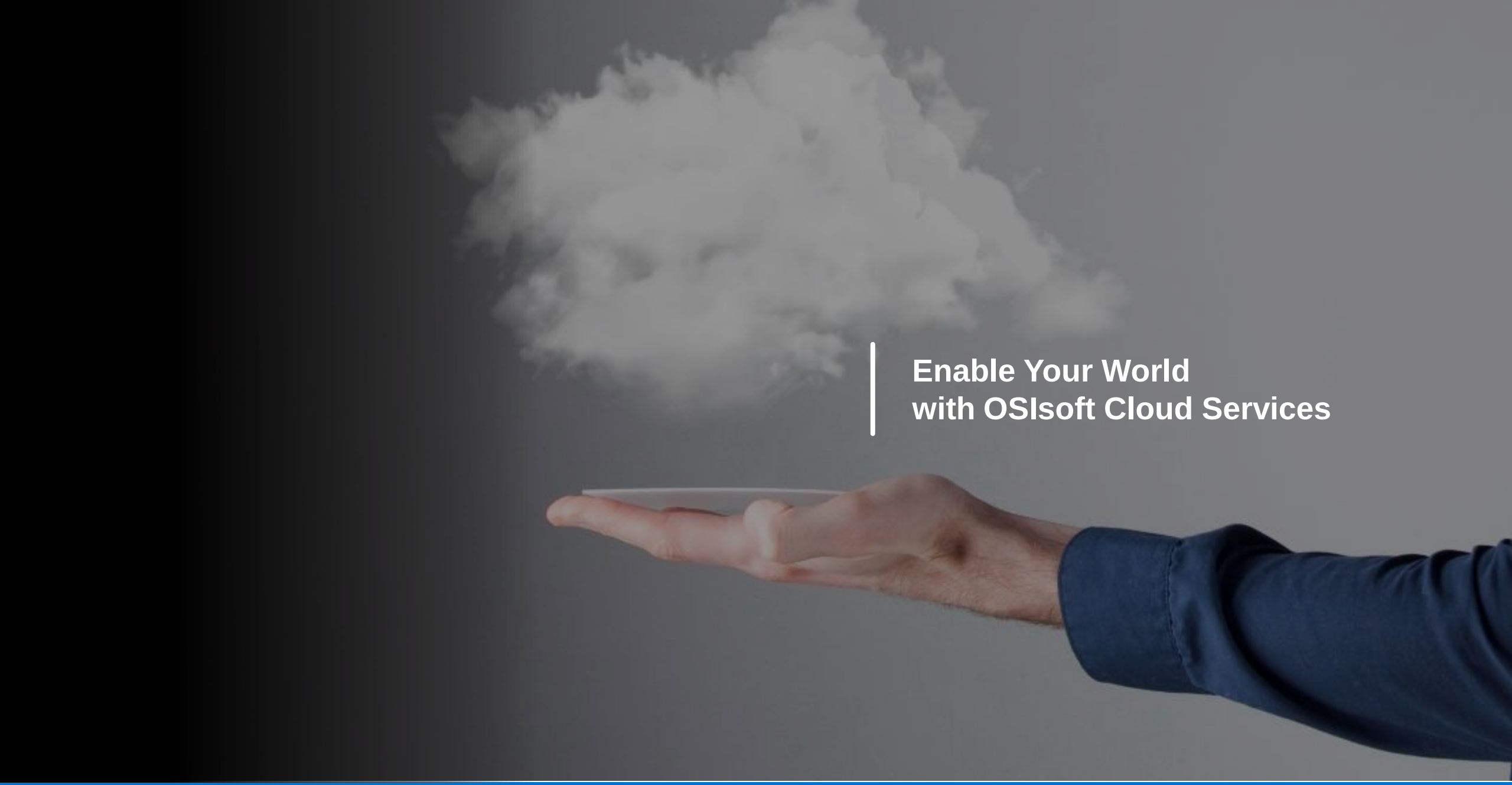

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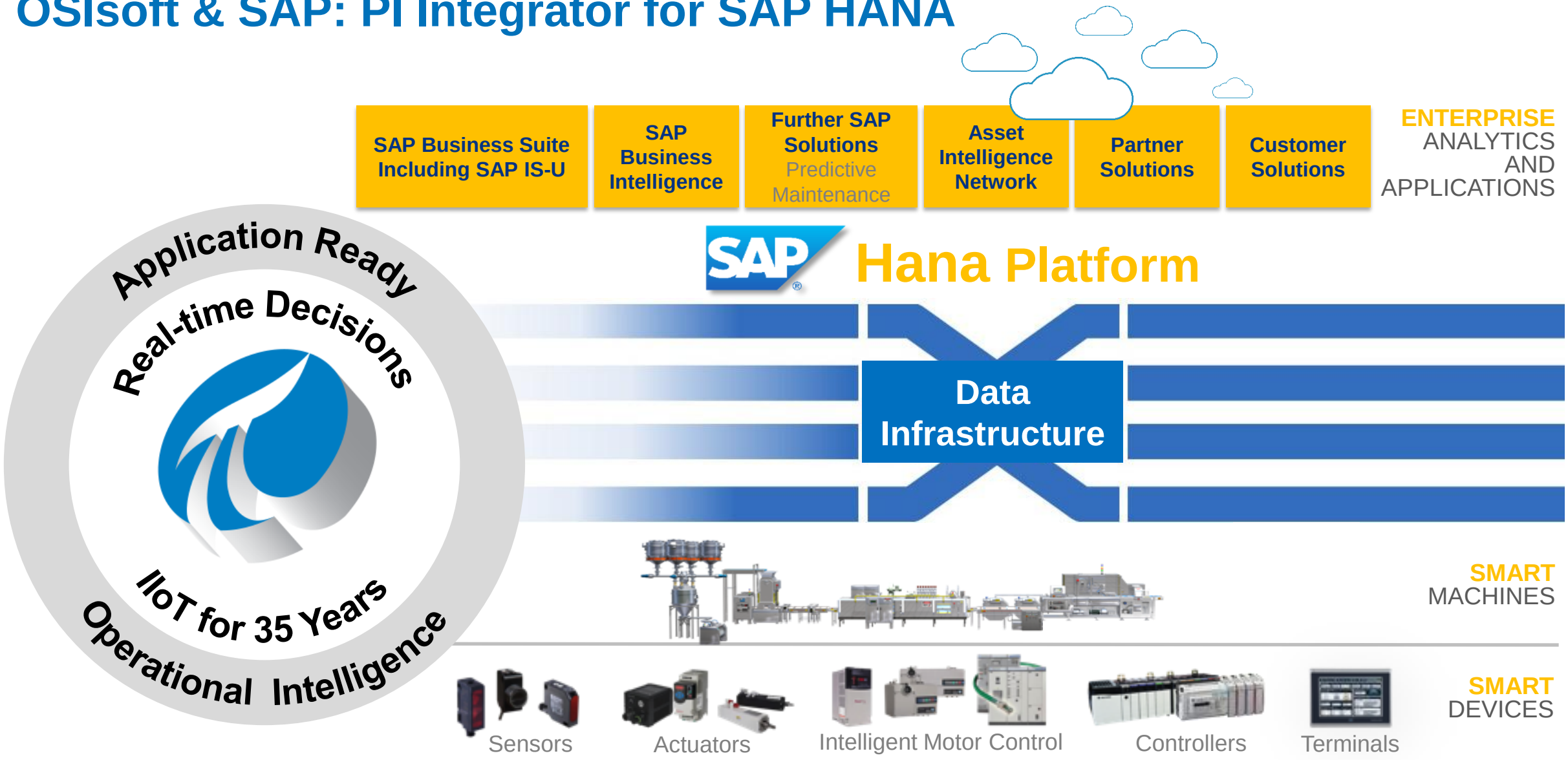
OSIsoft & SAP: PI Integrator for SAP HANA



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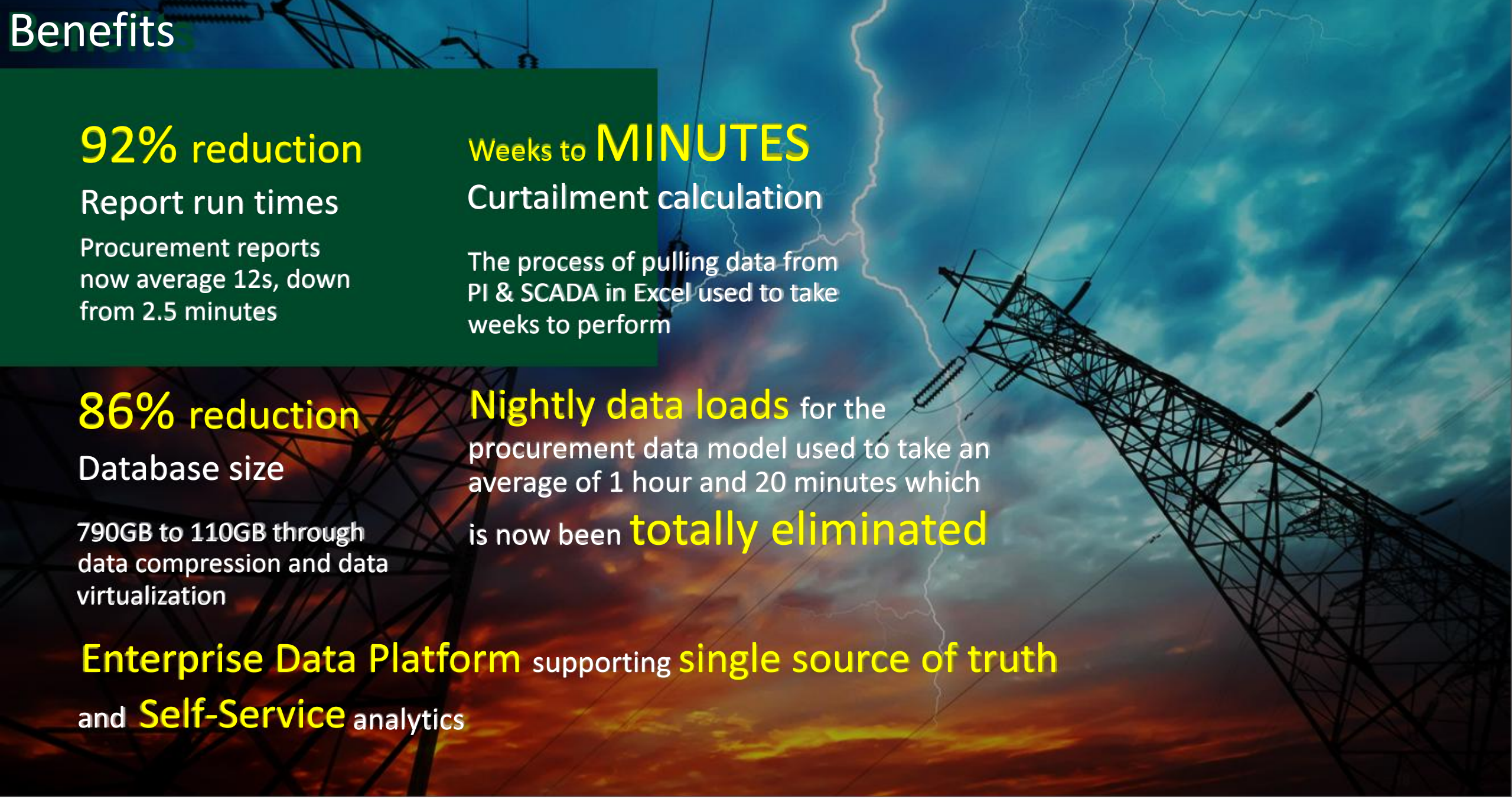
Benefits



92% reduction

Report run times

Procurement reports now average 12s, down from 2.5 minutes

Weeks to MINUTES

Curtailment calculation

The process of pulling data from PI & SCADA in Excel used to take weeks to perform

86% reduction

Database size

790GB to 110GB through data compression and data virtualization

Nightly data loads for the procurement data model used to take an average of 1 hour and 20 minutes which is now been **totally eliminated**

Enterprise Data Platform supporting **single source of truth** and **Self-Service** analytics

OSIsoft & SAP: Asset Intelligence Network

SAP Business Suite Including SAP IS-U | **SAP Business Intelligence** | **Further SAP Solutions** Predictive Maintenance | **Asset Intelligence Network** | **Partner Solutions** | **Customer Solutions**

ENTERPRISE ANALYTICS AND APPLICATIONS

SAP **Hana Platform**

Data Infrastructure

SMART MACHINES

Sensors

Actuators

Intelligent Motor Control

Controllers

Terminals

SMART DEVICES

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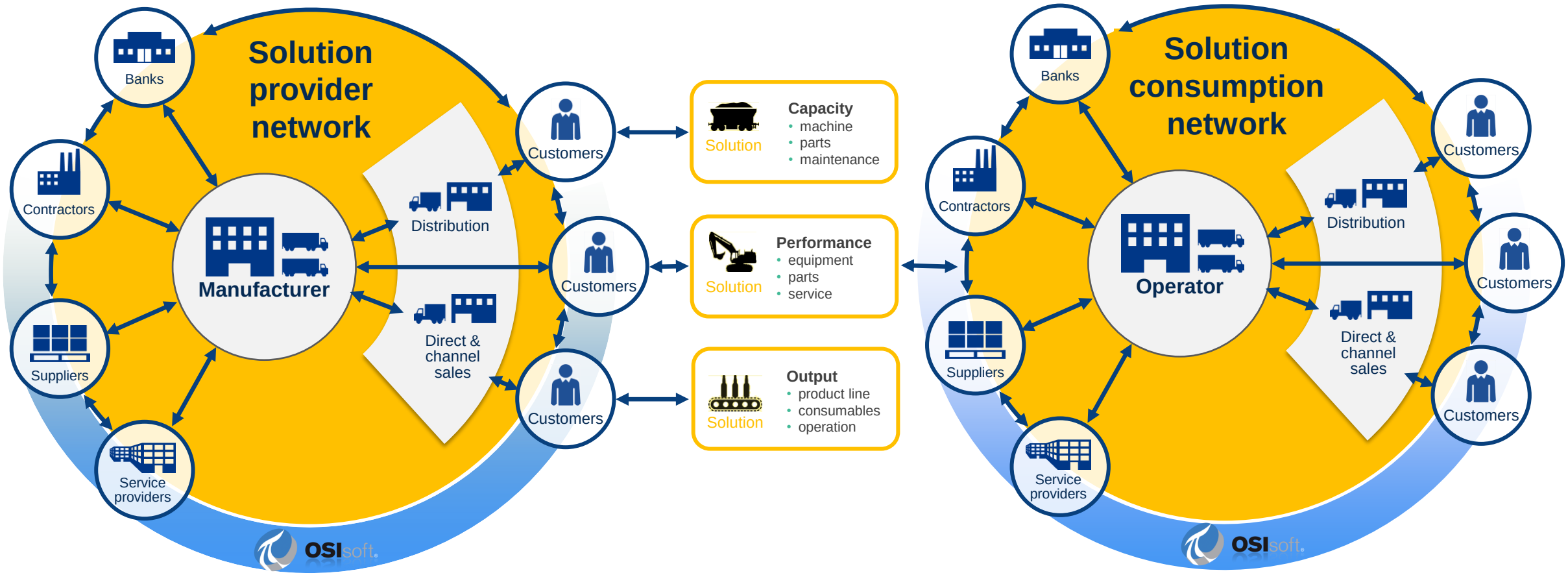
SAP Asset Intelligence Network is a Global Network of Machines Bringing Together Business Partners

Asset information along the lifecycle is the key driver for collaborative asset management



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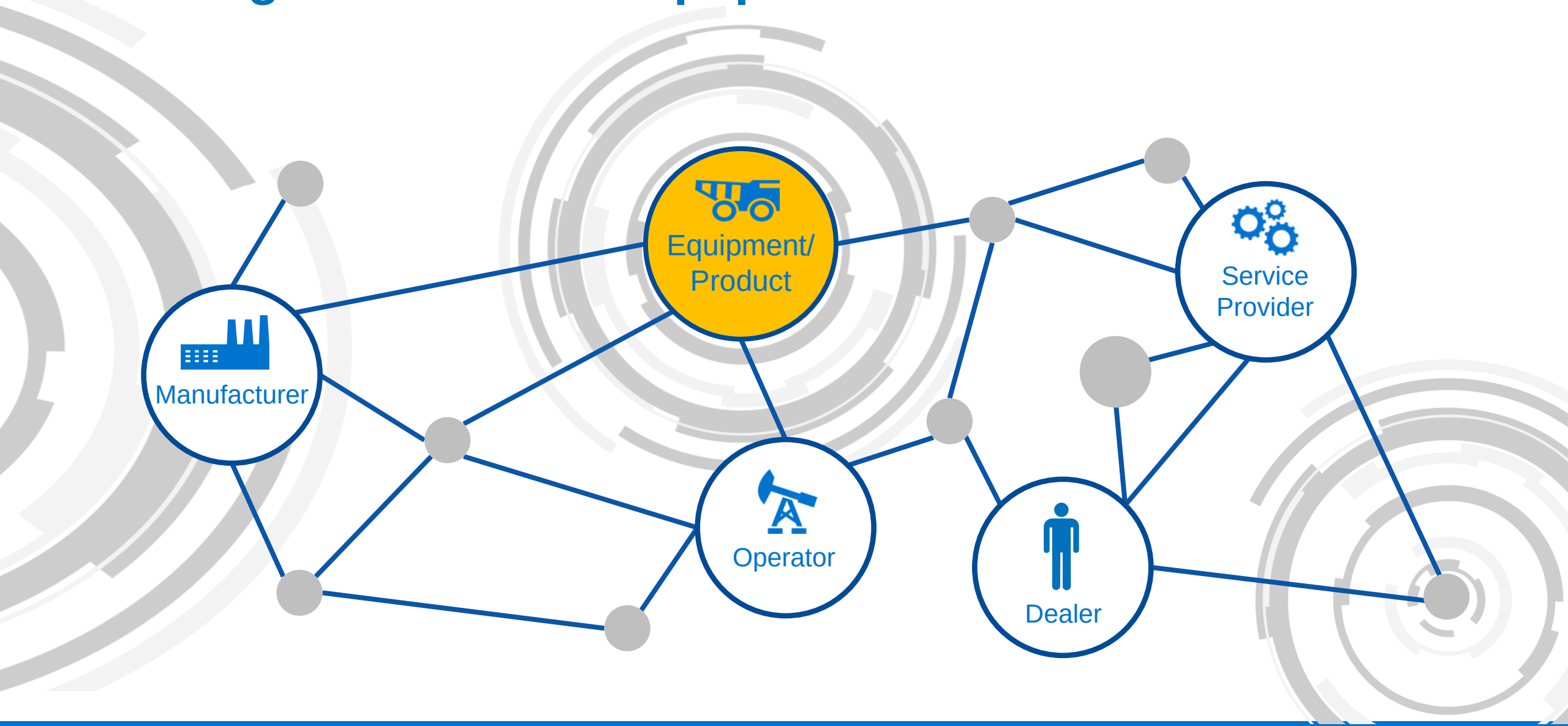
Realizing a Network of Equipment



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SAP & OSIsoft Empower Digital Transformation

Connect with Operational Intelligence

Transform Business Operations

Re-imagine Business

Manufacturer

SAP

Asset Intelligence Network

Digital Twin
Up to date service documentation
Spare parts / Replacement
Performance Benchmarking

SAP

Predictive Maintenance & Service

Condition Monitoring
Alerting
Vibration Analysis
Predictions

Service Provider

Connected Manufacturing / Smart Factory

Real-time visibility of shop floor operations. Intelligent production, One piece production

OSIsoft

OSIsoft

Asset Operator

Real-time visibility of shop floor operations, One Piece production

Monitor product performance and take action

One stop shop for the manufacturers, service providers, & operators of the world's assets

Order replacement parts and Services from **business network**

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Accelerate Your Transformation with OSIsoft Services

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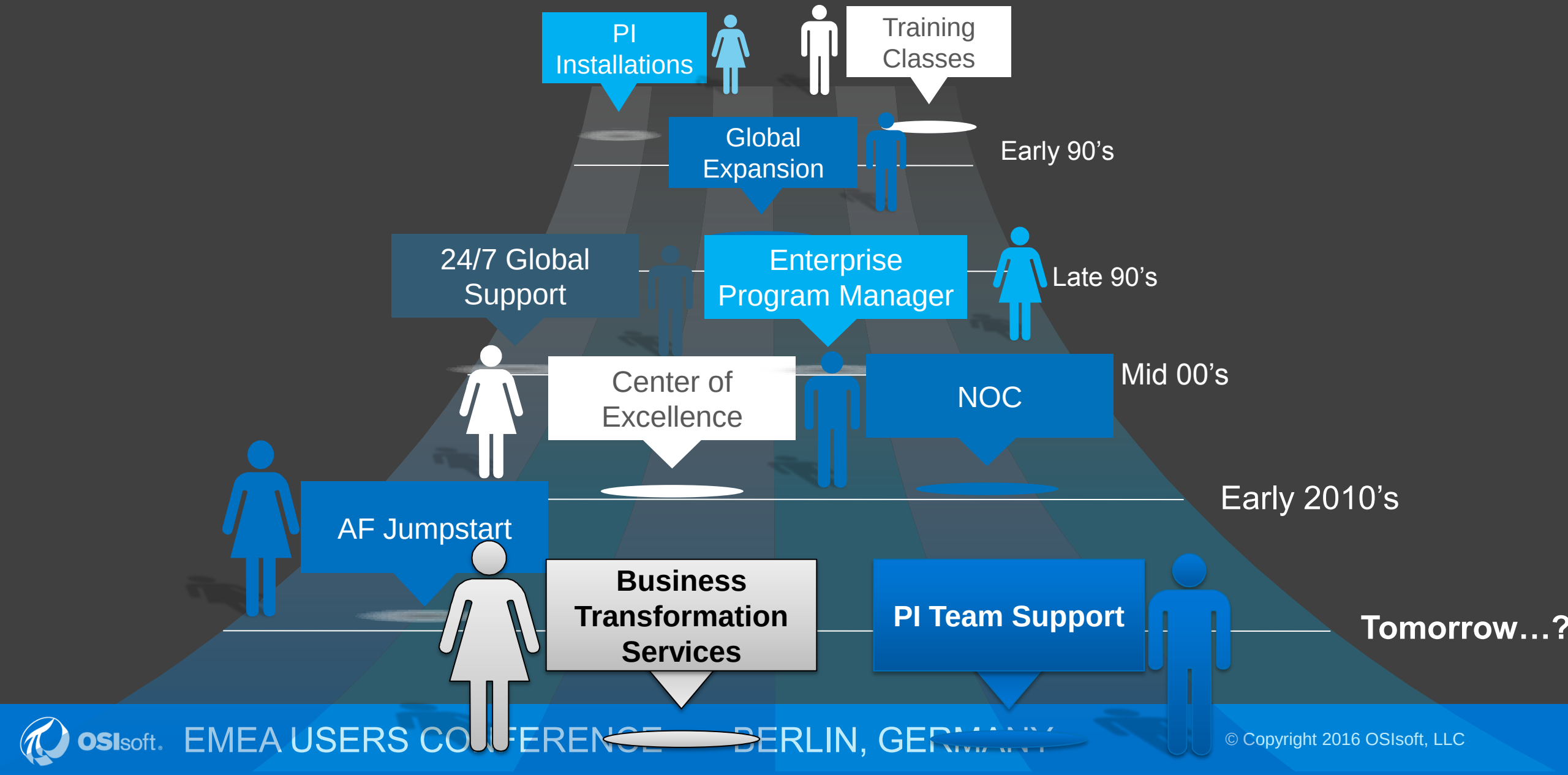
Helping accelerate the transformation of your business



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Advance Your Ecosystem with OSIsoft Marketplace

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OSIsoft. PartnerEcoSphere

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Proven and Trusted Digital Transformation

125+ **Countries**

Executives

1300+ **Case Studies**

450+ **Interfaces**

Business

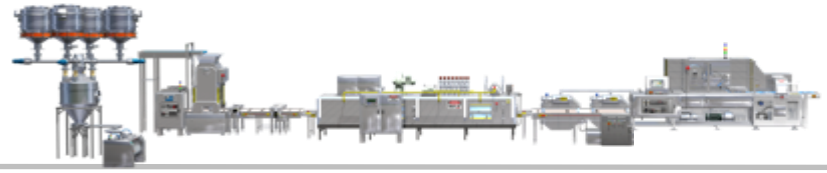
1.5 Billion **Sensors**

17,000+ **Sites**

Operations

Application Ready
Real-time Decisions
IIoT for 35 Years
Operational Intelligence

Data Infrastructure



SMART MACHINES

SMART DEVICES

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THANK YOU

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