

IT/OT Convergence – EDF and The SAP HANA IoT Integrator Story

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What We'll Cover

- SAP OSIsoft Partnership
- IT/OT Convergence
- EDF RE Story
- Other Utility Use Cases
- Solution Architecture and Roadmap
- Questions

Insight to Action

**BUSINESS
PROCESSES**

Advanced
Visualization

Advanced
Analytics

SAP HANA

SAP HANA IoT Integrator by OSIsoft

**Operational
PROCESSES**



Real-time
Decision Support



Real-time Business
Decision Support



Cyber Security

OSIsoft®

Real-time Operational
Decision Support

soft.

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port

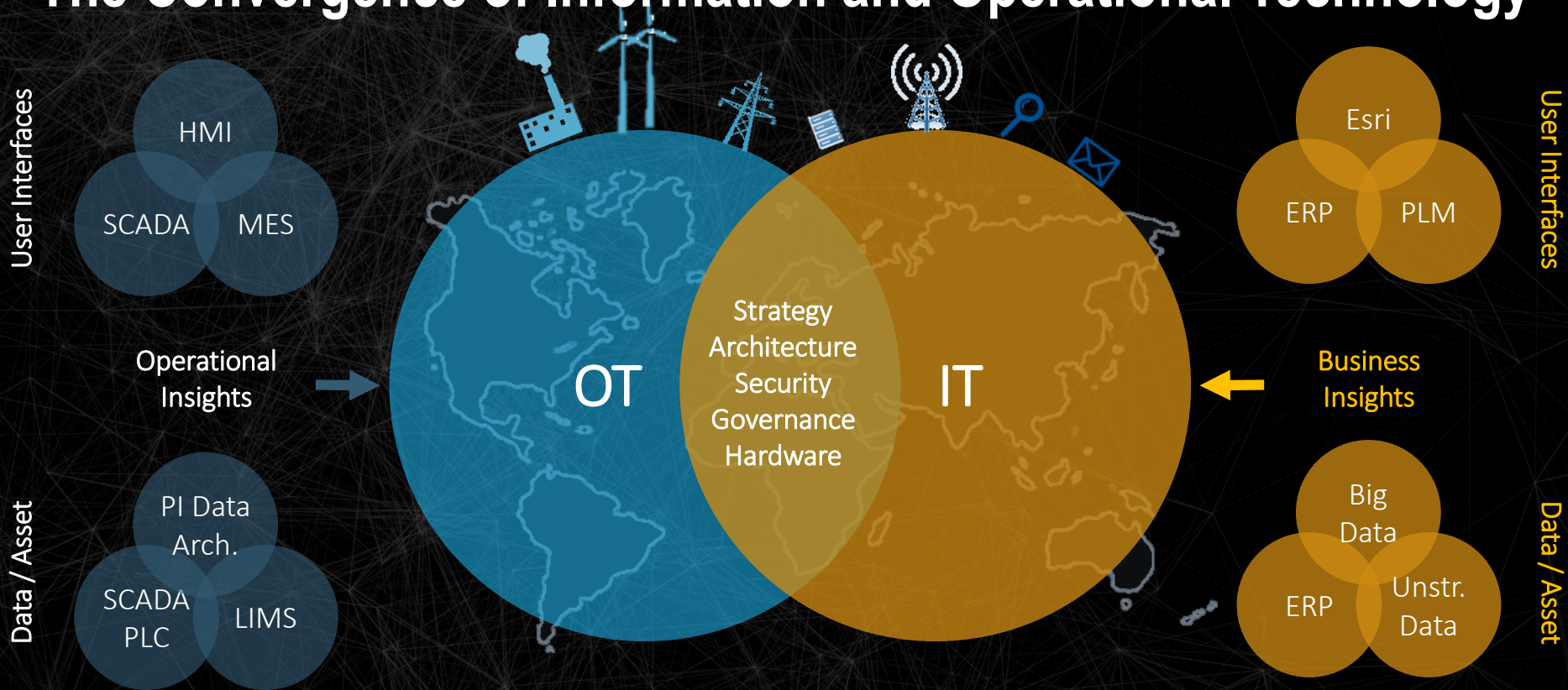


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The Convergence of Information and Operational Technology



Enabling digital enterprises to do business innovation

Value through Convergence of IT and OT in Utilities

- Utilities are pursuing IT/OT integration to enable smart grids, handle volatile renewable energy resources and improve the return on their assets.
- Business processes supported include:

Real-time grid analytics

Outage prevention and management

Asset health management and predictive maintenance

Leakage and fraud management

Consumption and load analytics

Demand response management

Commercial load planning and virtual power plants

Management of wind farms



The EDF RE Story

Enterprise data platform featuring the first IT/OT integration powered by SAP HANA and IoT Integrator by OSIsoft

- Integrating operational, transactional and geospatial data
- Near real-time integrated operational and business intelligence
- Informed management, strategic and operational decision making
- Enables workforce management and scheduling optimization

EDF, the world's biggest energy generator

38.5

Million
customers
worldwide

72.9

Billion Euros in
annual revenue

12

Billion Euros in
net investment

FIRST



Generator of new energy
& renewables in Europe

28.3 GW

Installed capacity



Power Grid
operator in Europe

105,000 Km of power lines

47 Cross border lines



Nuclear Operator
in the World

73 reactors

In France & UK

*Annual report 2014

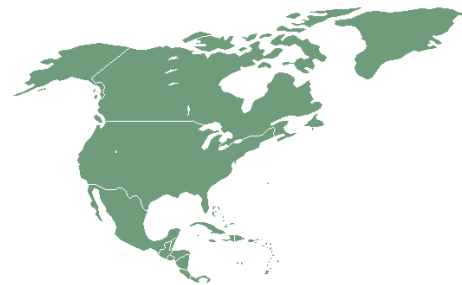
EDF Renewable Energy



Subsidiary of EDF
Energies Nouvelles, the
renewable arm of EDF



Leader in
development & operation
for wind and solar



North America Portfolio

7.8 GW Developed
projects

4.1 GW Installed
capacity

10.7 GW Operations &
Maintenance

30 years

Expertise in
renewable industry



Also presence in:
battery storage,
biogas and biomass



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Project Drivers



Large amounts of data
in silos



Data
integration
challenges



Data inconsistency



Compliance & security
requirements

Solution

A unified Business Intelligence (BI) & Data Warehouse (DW) platform enabling advanced BI and Analytics applications through -

- Data integration
- Data analysis
- Data modeling
- Information delivery

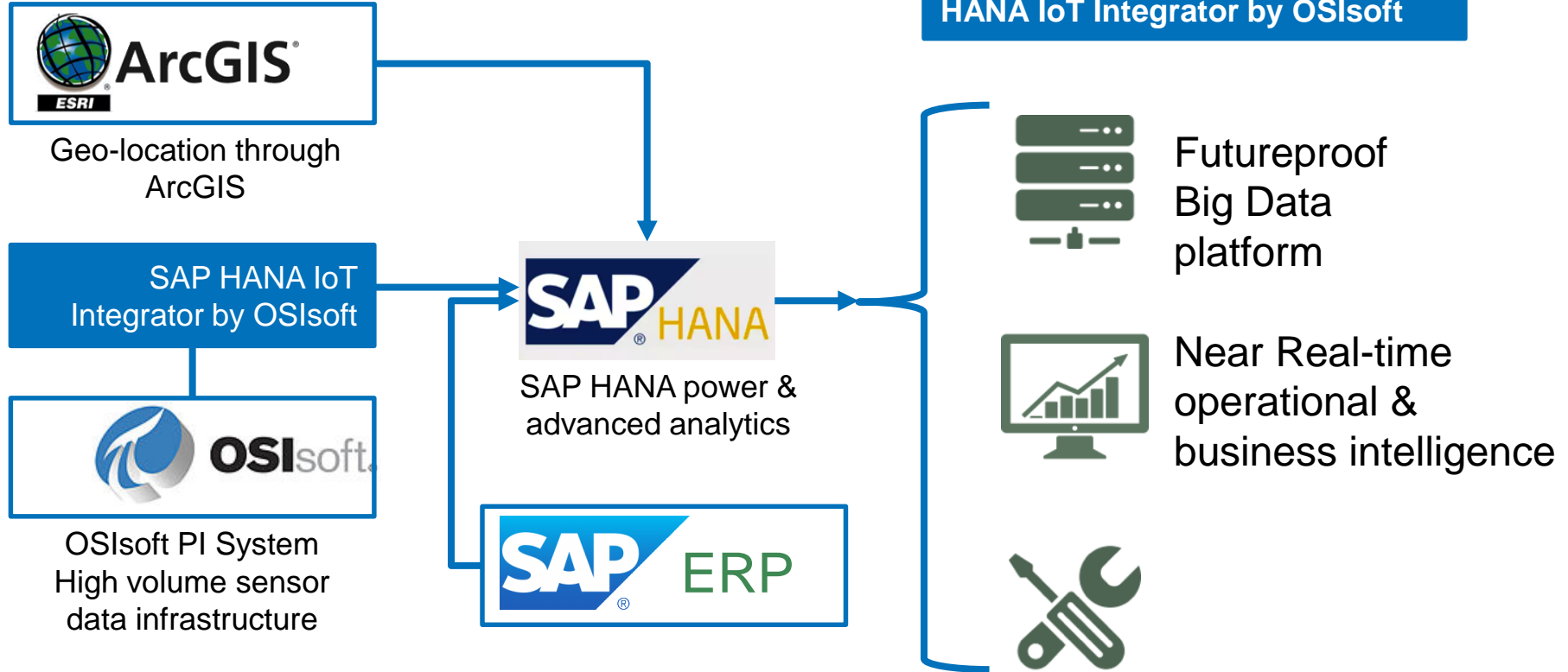


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Project Overview



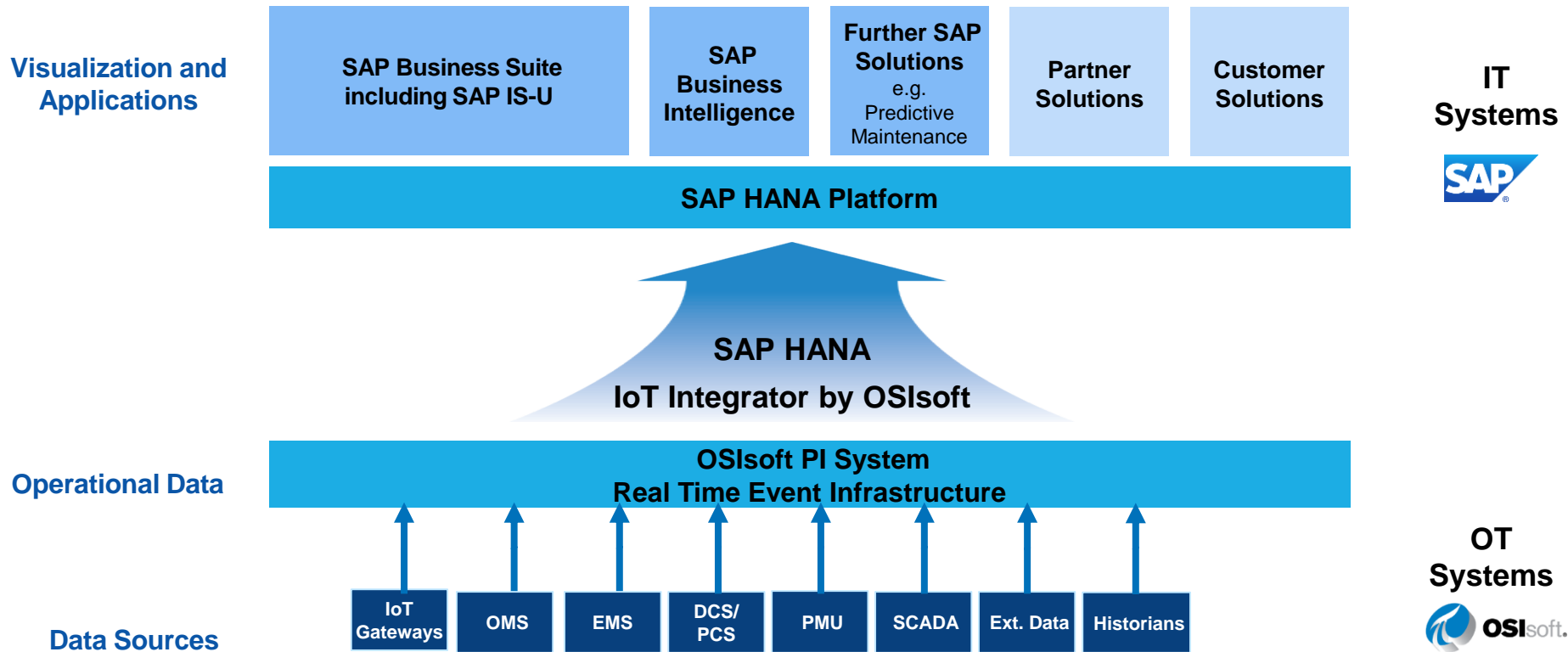
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SAP HANA Platform and OSIsoft PI Server

Enable real time IT/OT convergence



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EDF Use Cases



Executive Suite

Near real-time reporting and analysis
resulting in better decision making



Operations

Near real-time predictive asset and maintenance analytics
leads to improved operating efficiencies



Business Management

Holistic view of asset and financial performance with
drill down analysis enabling
decreased risks & informed decisions

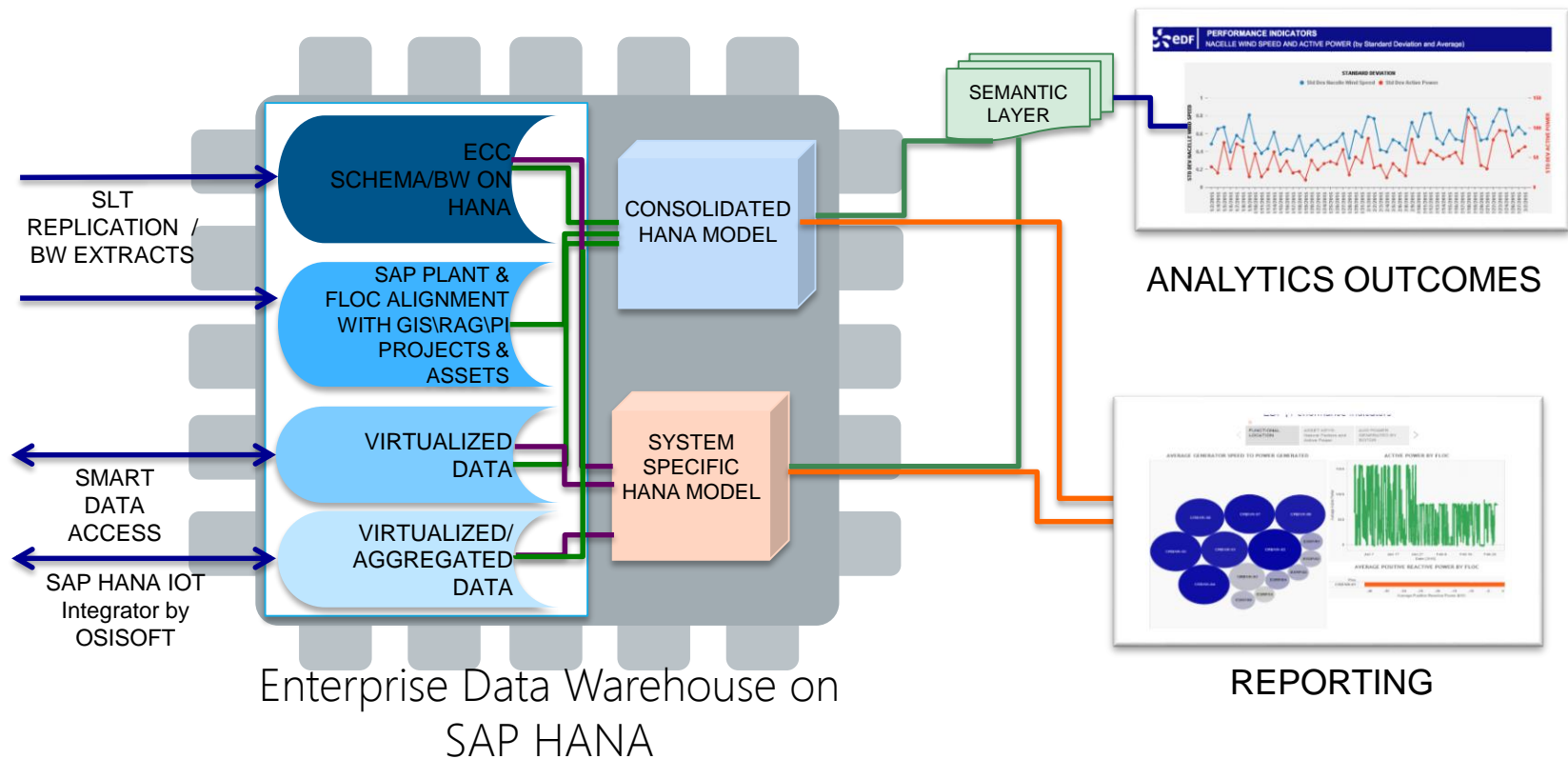


Digital Enterprise

Collaborative data platform enable improved operating
efficiencies both internally and externally



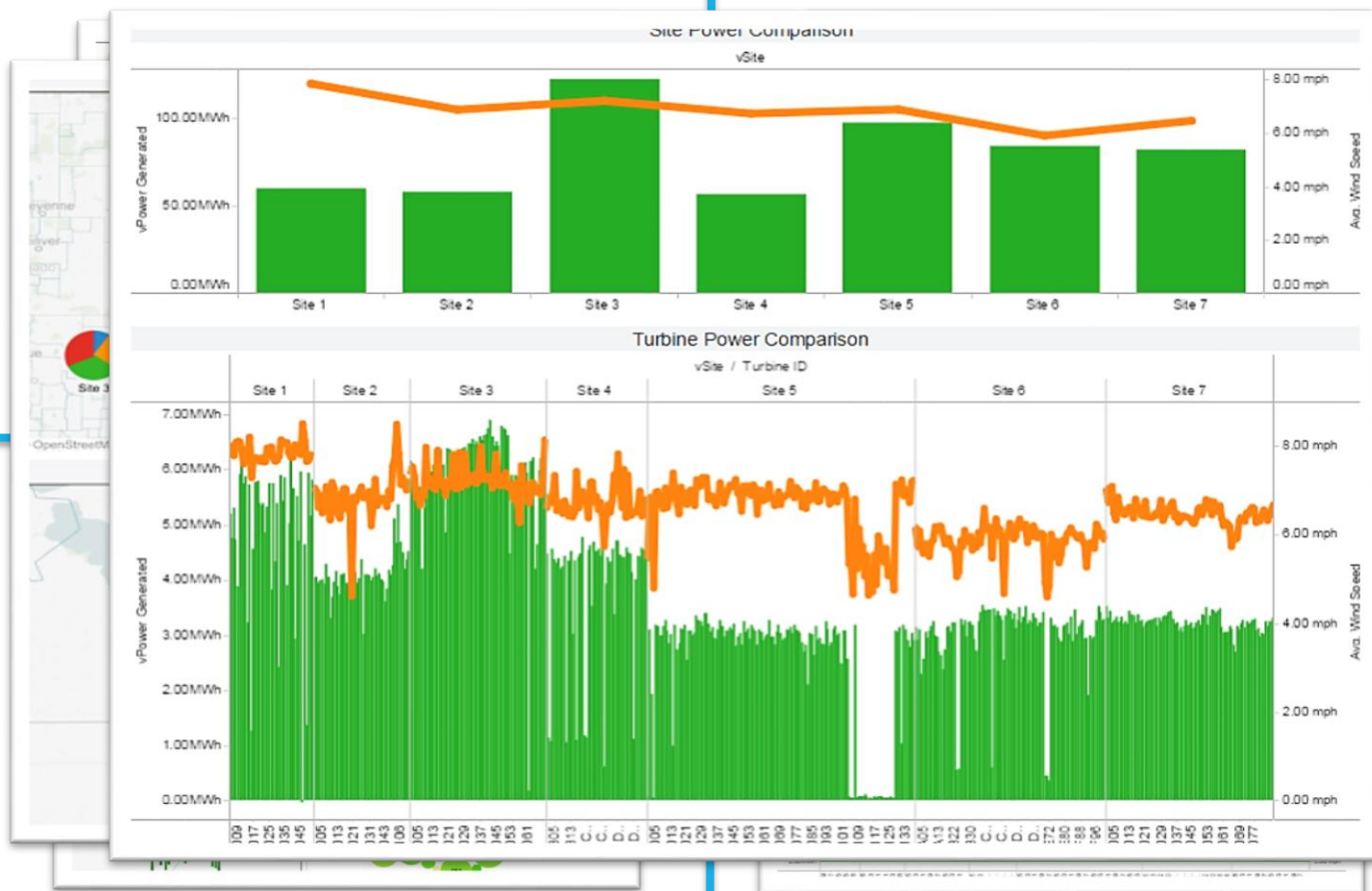
Technical Solution



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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

What's Next for EDF RE



BI & Analytics portal to share information with EDF RE's customers



Integrate more data, such as lease data, contract data, market data, manufacturer and OEM data



Build predictive analytics and improve preventative maintenance, workforce management and scheduling optimization



Expand to include sensor data from solar, biomass, and battery storage



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Architecture and Roadmap

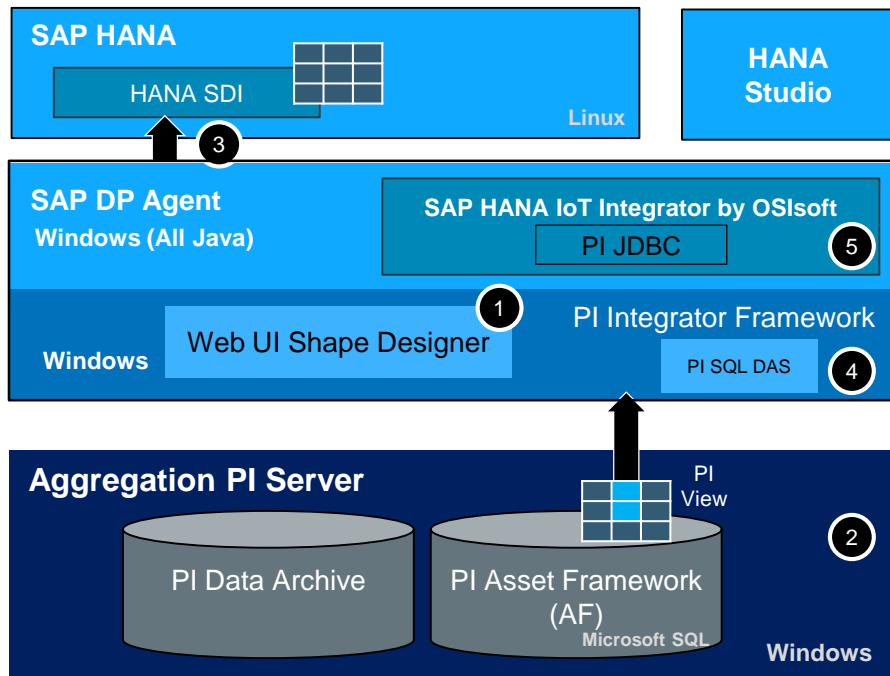


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Solution Architecture - Pull



Legend

:

Component
sold by
SAP

Component
sold by OSIsoft

Included with SAP HANA IoT Integrator
by OSIsoft (no fee). Provisioned by
OSIsoft

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 SDI and
SAP HANA IoT Integrator by OSIsoft

4

PI SQL DAS controls access to PI Views

5

SAP HANA IoT Integrator by OSIsoft
retrieves data from PI View located in SQL
Server via PI JDBC driver

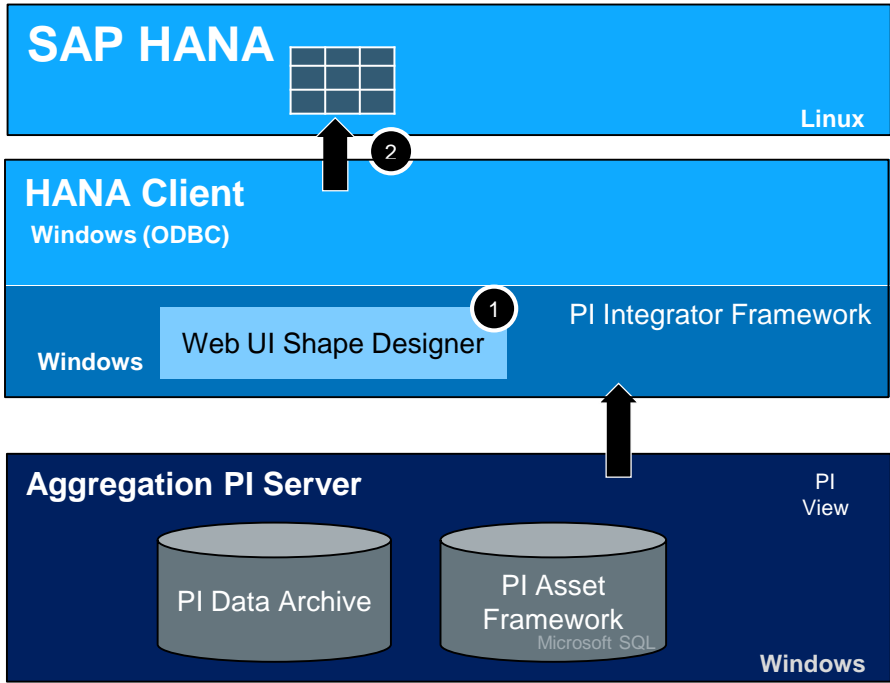


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Solution Architecture - Push



- 1

User creates PI View in Web UI Shape Designer via PI Integrator Framework
- 2

PI Integrator Framework streams data to HANA via HANA Client (ODBC)

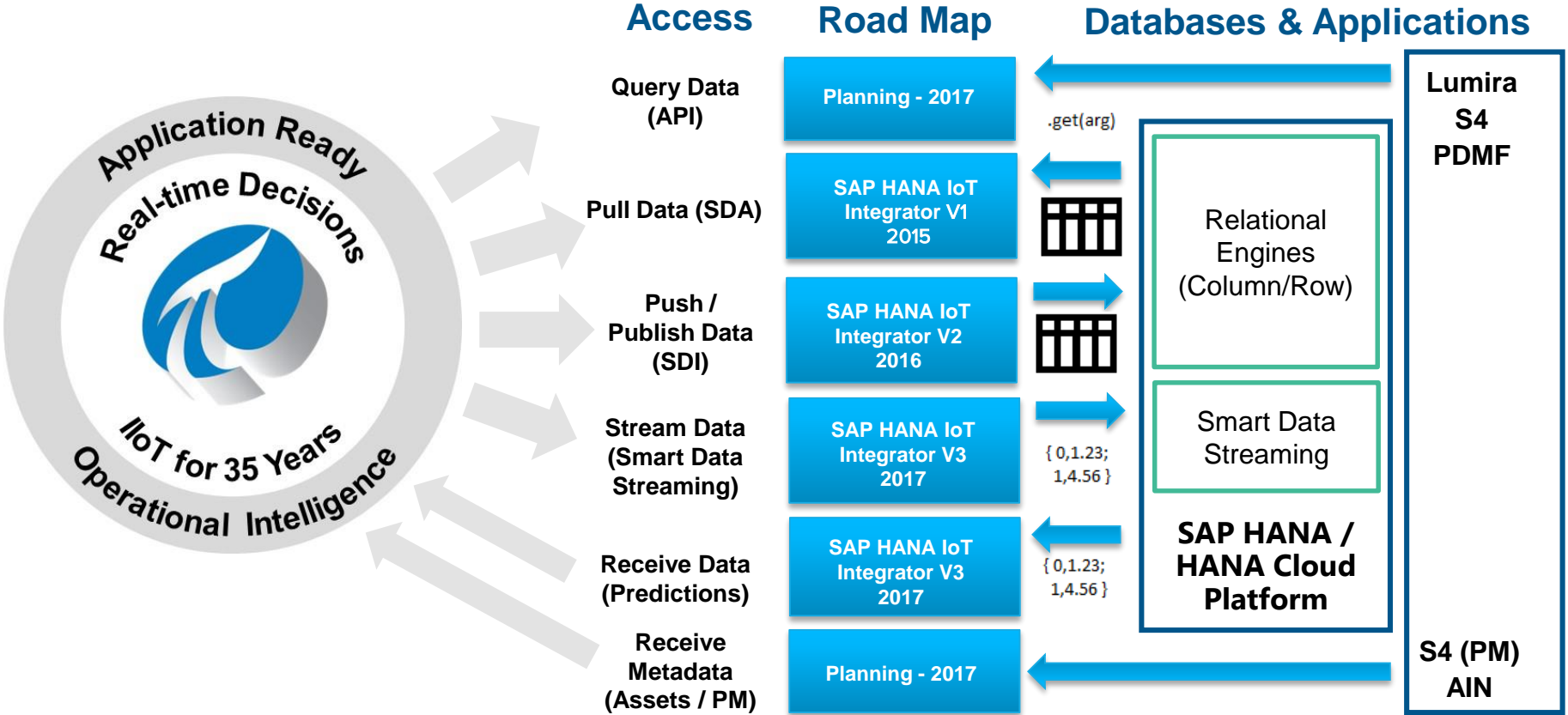
Legend:

Component sold by SAP

Component sold by OSIsoft

Included with SAP HANA IoT Integrator by OSIsoft (no fee). Provisioned by OSIsoft

SAP IoT Integrator by OSIsoft



SAP HANA IoT Integrator V2

- Supports both HANA on premises and HANA Cloud Platform
- Based Completely on Smart Data Integration (SDI)
- Both Push and Pull methods
- Uses Latest SDI API – support for SPS10 and later and HCP
- No longer requires SQL Server DB – uses embedded open source DB
- Better performance for SDI Pull (pass through queries)
- Continuous Publication through SDI Push
- PQ Process starting in November 2016, EOY 2016 Release



Questions

Please wait for the
microphone before asking
your questions



State your
name & company

Please don't forget to...

Complete the Survey
for this session



The **Power of Data**

DECISION READY IN REAL-TIME

Evaluation Form (Seminar Location - Date)

Name: _____

Company: _____

Email: _____

Quality and content of the presentations

Poor Good Excellent N/A

| | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Welcome | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The Journey To Real-Time Operational Intelligence | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The Power of Connection | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tank Level Management System | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Unleash your Infrastructure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information on the Spot | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wrap-up/Seminar Conclusion | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Quality and organization of the seminar

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| Choice of date | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Time allowed for lunch/breaks | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Choice of presentations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Break and time allowed for the presentation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



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감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado



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