Why a data lake alone can’t replace your PI system

John de Koning, Customer Success Advisor OSIsoft

Conference Theme & Keywords

Business challenge

Operational Performance

Asset Integrity & Reliability

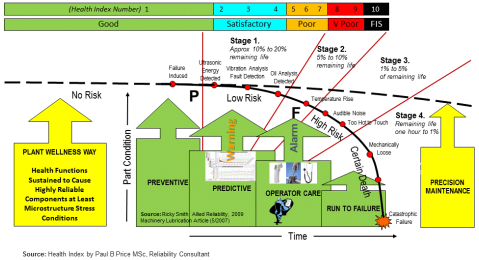
Disciplined delivery

Empowered People

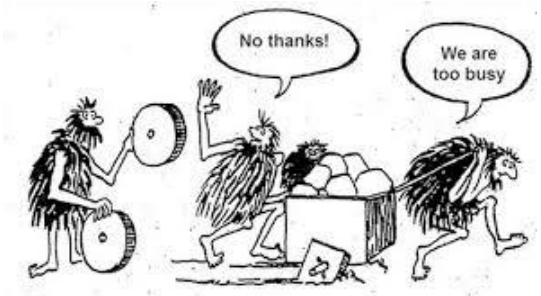
Additional challenges

Continuous drive to improve safety

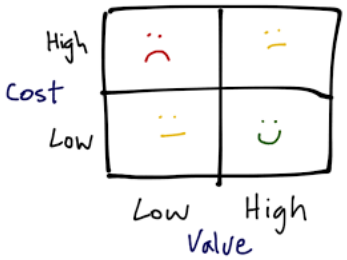
Machine Health & Reliability Measurement



Production reliability not Top Quartile

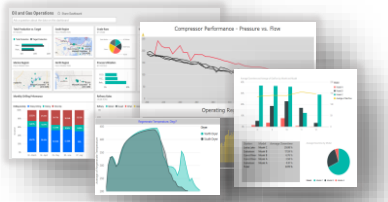


Each facility addressing similar business challenges



Overall result:
Cost too high,
Value too low

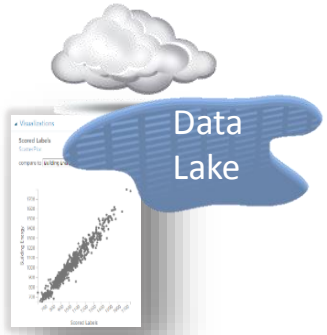
Pitfall: Complex environment



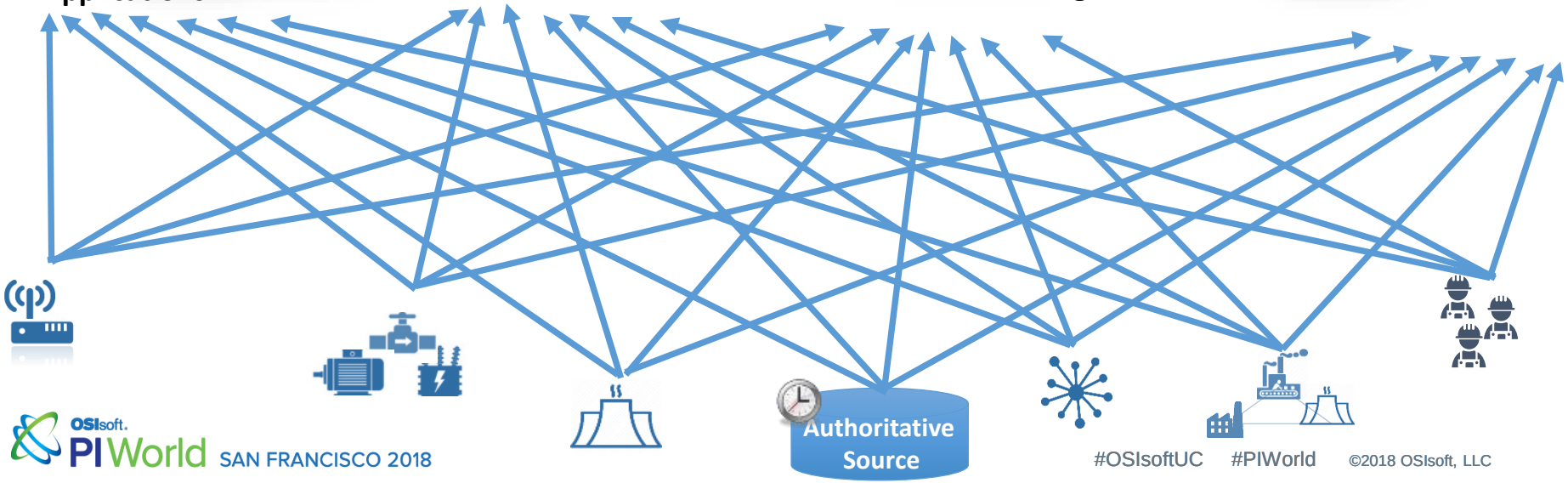
Applications

Services

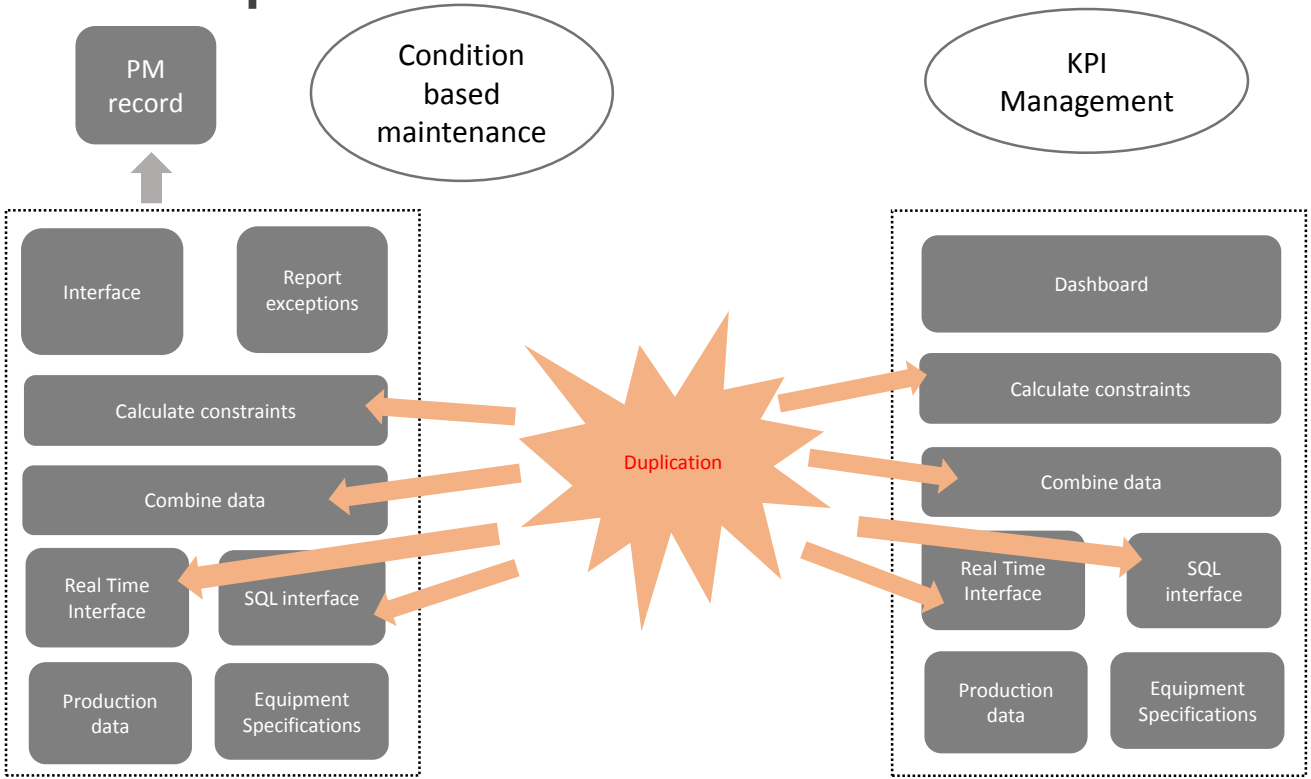
Real-time Monitoring



Advanced Analytics

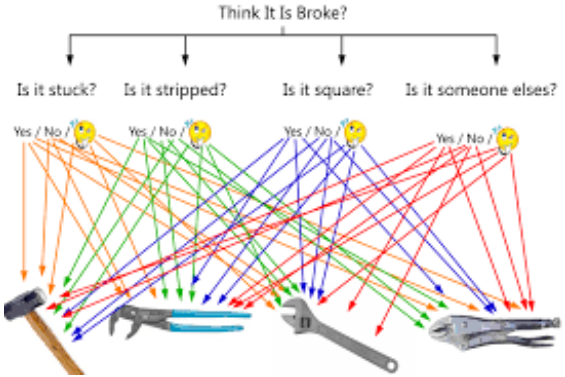


Pitfall: Duplication of Effort



Pitfall: Tools don’t match the workflows

- Every tool has a specific job
- In the right hands, the right tool will get the job done
- Be functional not fashionable
- For using not for displaying

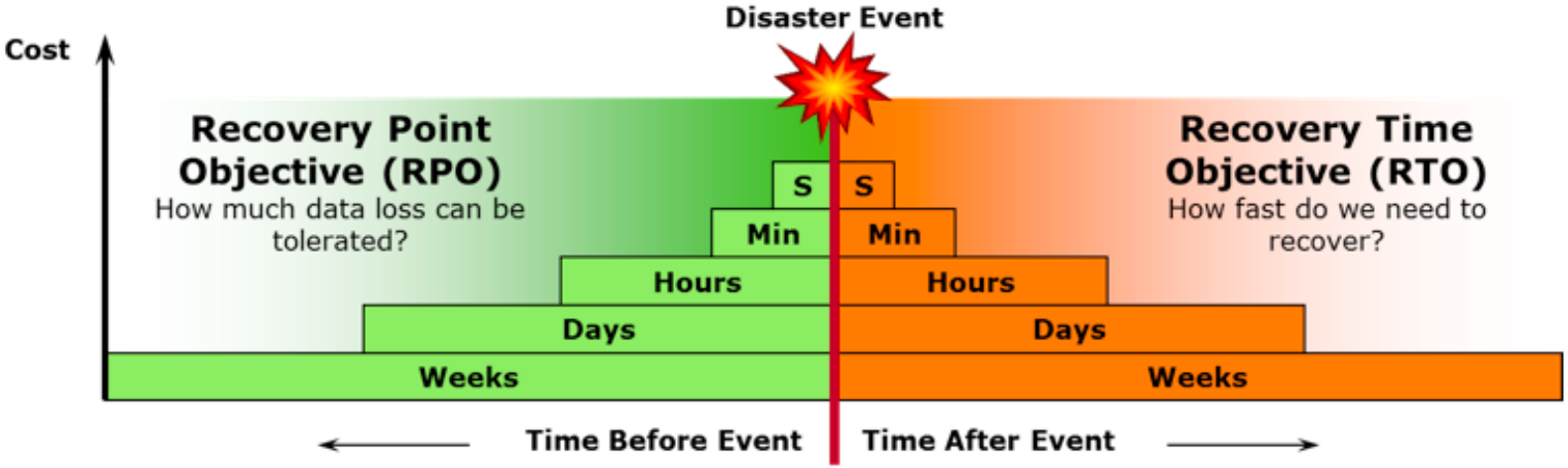


Design Principles: Business Impact Assessment

Disruption Risk Scales

Category	Negligible	Minor	Moderate	Major	Severe
Financial	Potential loss of < $10,000	Potential financial loss of $10,000-$50,000	Potential financial loss of $50,000-$200,000	Potential financial loss of $200,000-$500,000	Potential financial loss of $500,000 +
Human	Potential for minor injury requiring first aid treatment	Potential for injury or illness resulting in medical attention and several days off work	Potential for injury or illness resulting in short-term hospitalisation	Potential serious long-term injury	Potential for death, permanent disability or ill-health
Legal/ Compliance	Minor internal dispute that can be remedied without external intervention	Potential for compliance, contractual or regulatory breaches with external implications	Confirmed compliance, contractual or regulatory breaches. Specific activities required to remedy situation	Significant penalties and/or costs to remedy legal and/or compliance breaches	Severe penalties to company and/or staff
Operational	No noticeable impact on operational functions	Short-term disruption to operational functions	Significant disruption to operational functions	Extended disruption to operational functions	Collapse of operational functions
	No noticeable impact on supply chain	Short-term disruption to supply chain	Significant delays to supply chain	Extended delays to supply chain	Total supply chain failure
	Minimal change to work conditions	Short-term increase in working hours	Sustained deterioration in working conditions	Long-term deterioration in working conditions resulting in increased sick leave and potential resignations	Unacceptable working conditions resulting in workplace injuries/illness and resignations
Reputational	Adverse impact that can be remedied immediately	Adverse impact that is short term and reversible at minimal cost	Adverse impact with potential for significant damage	Impacts requiring long term remedial attention	Irreversible damage to brand and reputation
Strategic/ Market	Localised concern – no impact on long term viability	Detrimental to short-term profitability and/or strategic direction	Detrimental to mid-term profitability and/or strategic direction	Significant long-term impacts. Will required change strategic direction and objectives	Business viability in question

Design Principles: Recovery objective



Design Principles: High level rules

- All closed loop related control functionality or functionality that could cause a facility shutdown must be in the control system
- All functionality that could jeopardize safety must be in the control system

Business reasons for a PI system in the control environment:

- Control system doesn't have the capability for high fidelity trending
- Control system doesn't have the capability to calculate derived values or run small streaming analytics
- Network connectivity is of low performance (VSAT) or low reliability
- Productions need to run independent from corporate/business network

Find your way in the forest of Technologies

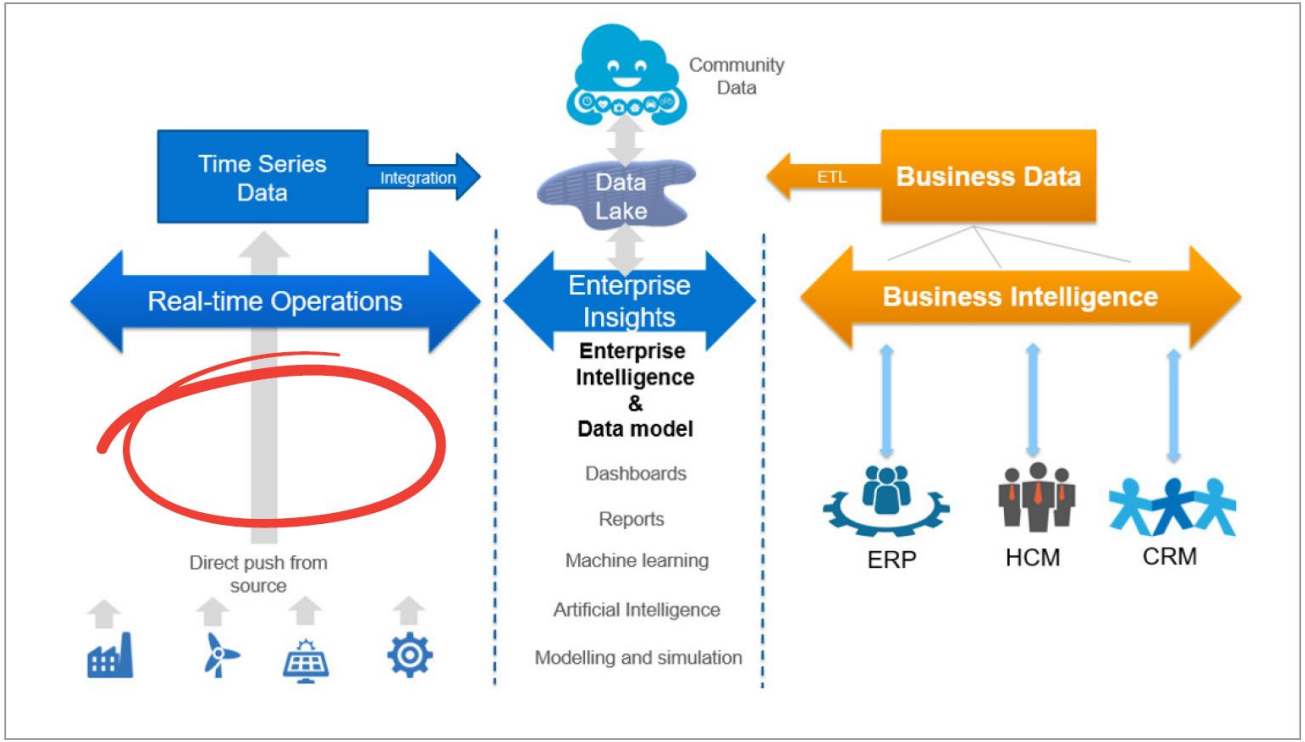
- *Businesses of all kinds are beginning to see their data as an important asset.*
- *Data can help make operations more effective and profitable.*
- *The ability to gather time-series and non time-series data is growing.*
- *More technologies are becoming available to help us make sense of it.*

How do we choose the right technology and approach for our business problems?

Data Warehouse versus Data Lake

Data Warehouse		Data Lake
Structures, processed	**Data**	structured / semi-structured / unstructured, raw
schema-on-write	**Processing**	schema-on-read
expensive for large data volumes	**Storage**	designed for low-cost storage
less agile, fixed configuration	**Agility**	highly agile, configure and reconfigure as needed
mature	**Security**	maturing
business professionals	**Users**	data scientists et. al.

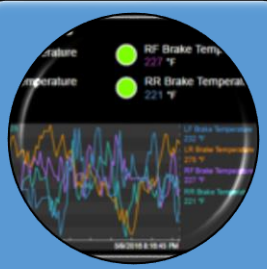
Perfect World



Fundamentals for Time Series Architecture

Connectivity

Ensure the corporate solution is able to connect to the variety of (legacy) data sources and potential new sources



Time-Series Capacity

The system should be able to deal with timeseries data (high fidelity, time indexing, and time synchronization)

Context

Easy-to-understand asset/equipment-based relations between the individual data streams, to enable business users to easily compare, view and analyze data on an equipment

Accessibility

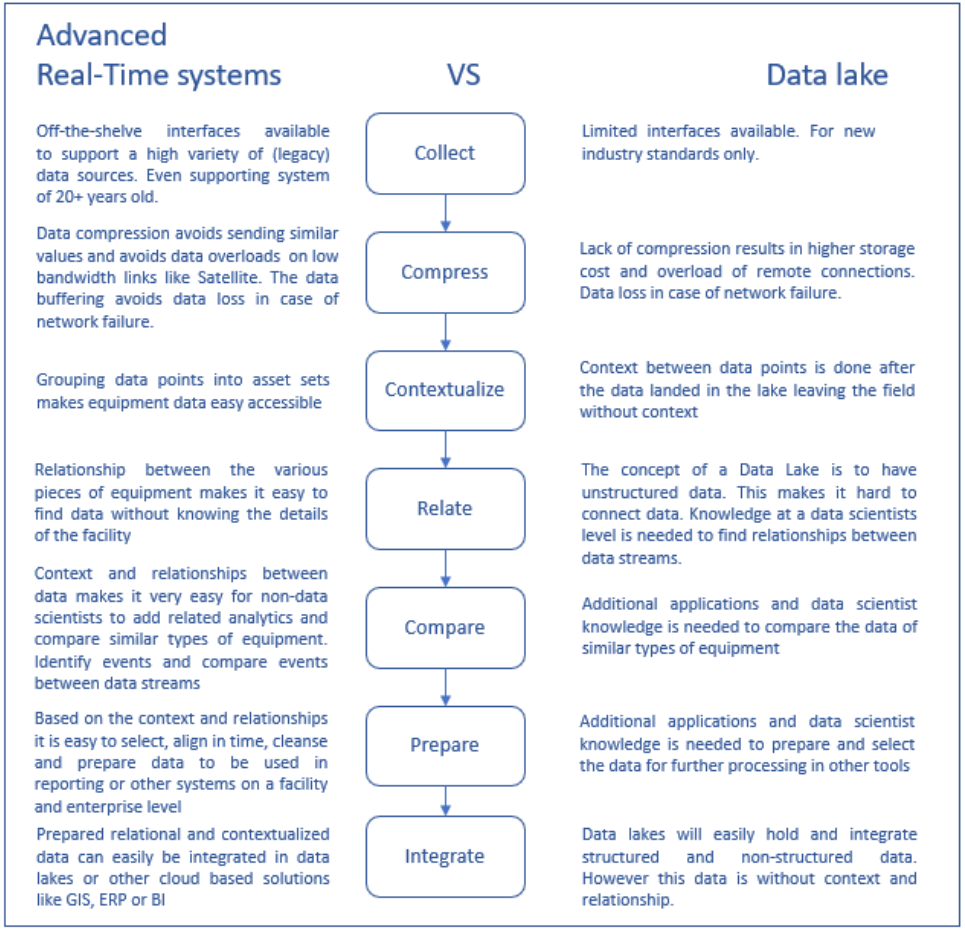
Users should be able to analyze and visualize the data with the tools of their preference to help optimize the facilities they operate

Security

Keep your production facility safe and secure! Don't allow unintended back-door access to your automation system

Foundation for success

Value of Real-Time Infrastructure

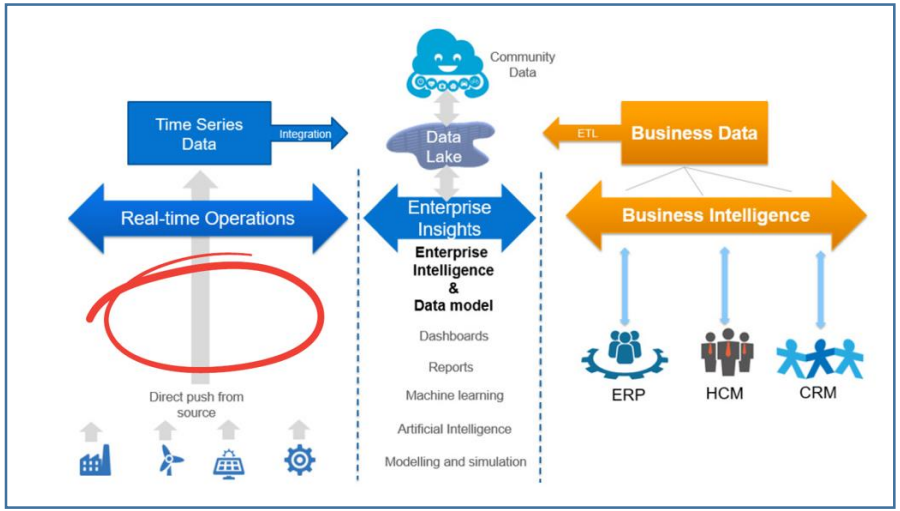


Power of Context

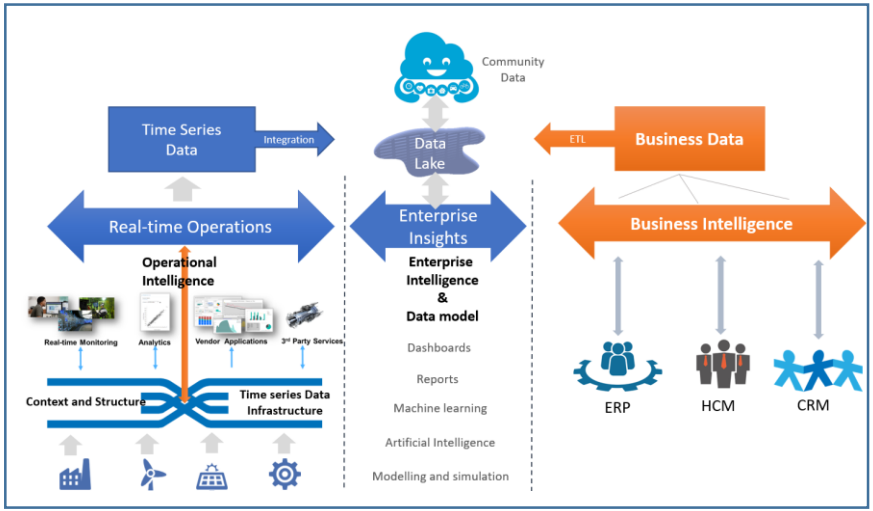
Time Series Data Infrastructure with Data Lake integration

- Automation vendor-based like Honeywell PHD or Yokogawa Exaquatum
- Open source-based like InfluxDB, Graphite, and Prometheus
- Rotating Equipment vendor-based like Siemens XHQ
- Vendor independent systems like the OSIsoft PI System

Hybrid Solution for RT Data in a Data Lake Environment

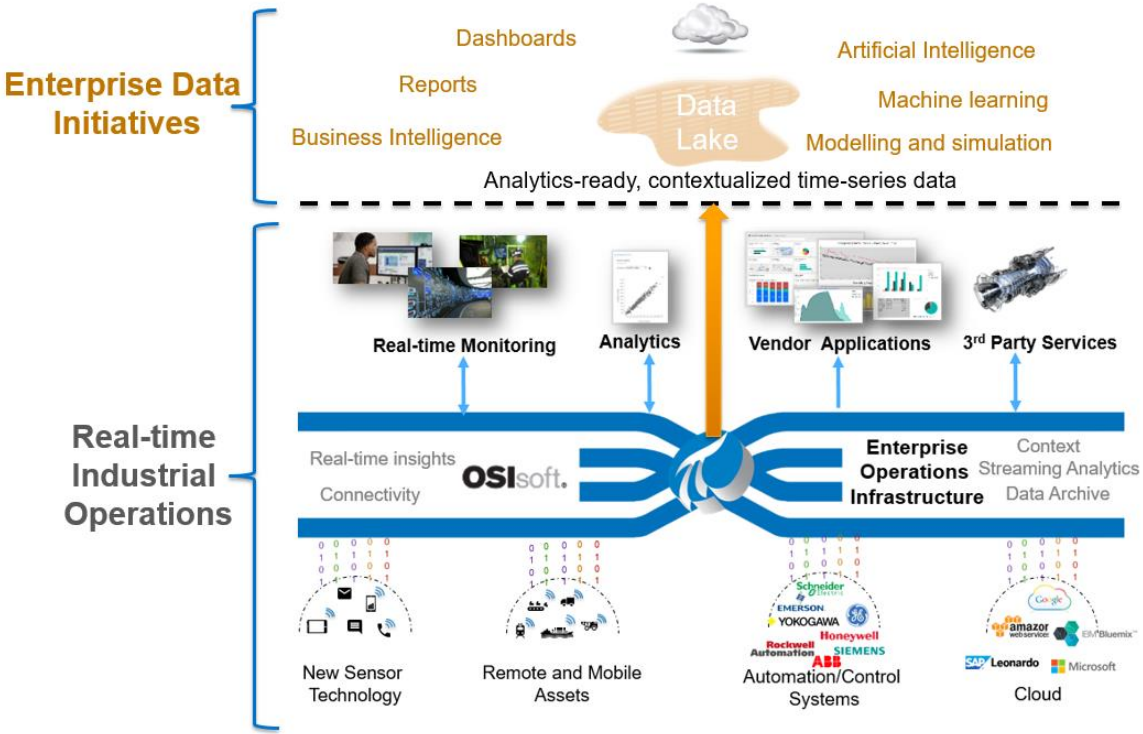


Perfect world

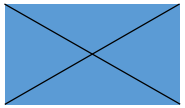


Hybrid reality

How OSIsoft PI System Blends in Perfectly



Why a data lake alone can’t replace your PI system



Leveraging Data Lake technology in a Real-Time environment

CHALLENGE

How to best integrate data in a Data Lake

- Many data sources
- Diversity of technology
- Context of data
- Data Security

SOLUTION

Understand your business challenges, What do you want to fix where, keep the five fundamentals in mind

- Get uniform access to data
- Create Digital Twins to standardize tools and use cases
- Synchronize in time
- Unlock the data to commonly used tools
- Secure the data

RESULTS

Predictable and value driven journey for Digital Transformation

- Company standardization
- Reusable solutions at the right place in the architecture
- Success transformation from Reactive to Predictive

Why a data lake alone can’t replace your PI system

- **John de Koning**
- con-jdekoning@osisoft.com
- Customer Success Advisor
- OSIsoft

Questions

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

State your **name & company**

Please remember to…

Complete the Online Survey for this session

Merci

谢谢

Danke

Спасибо

Gracias

Thank You

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ありがとう

Grazie

Obrigado

Optional: Click to add a takeaway you wish the audience to leave with.