Delivering Value from Realtime Data Infrastructure

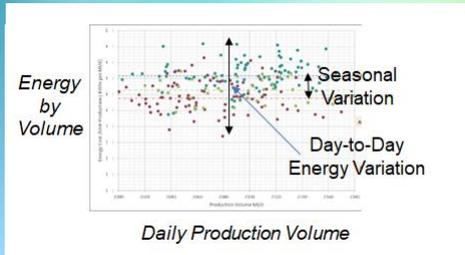## Simon Coombs, Accenture

Driving Value from Operational Analytics

Energy Intensive Producer

Complex production system with highly variable energy use – how to reduce total energy whilst maintaining quality?

OA identified that energy was highly dependent on controller *behaviour* and their interpretation and judgements. Simple, consistent *real-time* dashboards improved *visibility* and drove control *actions* to reduce whole system energy.

Achieved 10% reduction in total system energy within a few weeks

Power Generator

A mission critical regulator valve's actuation performance degrades over time – how long before next outage?


OA provided historical data on valve performance. When combined with algorithms to *forecast* degradation with *daily* estimates fed into the maintenance planning processes this can improve *trust* in the *operate vs maintain* decisions.
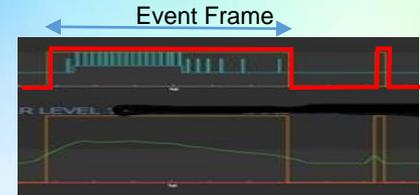
Improved and continuous estimates for time to intervene for effective planning

WasteWater Utility

Regulatory reporting of waste overflows requires manual assessment of potential spills – how to reduce this effort?
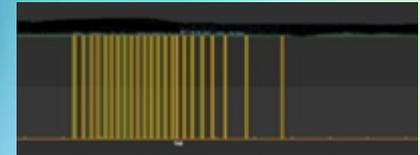
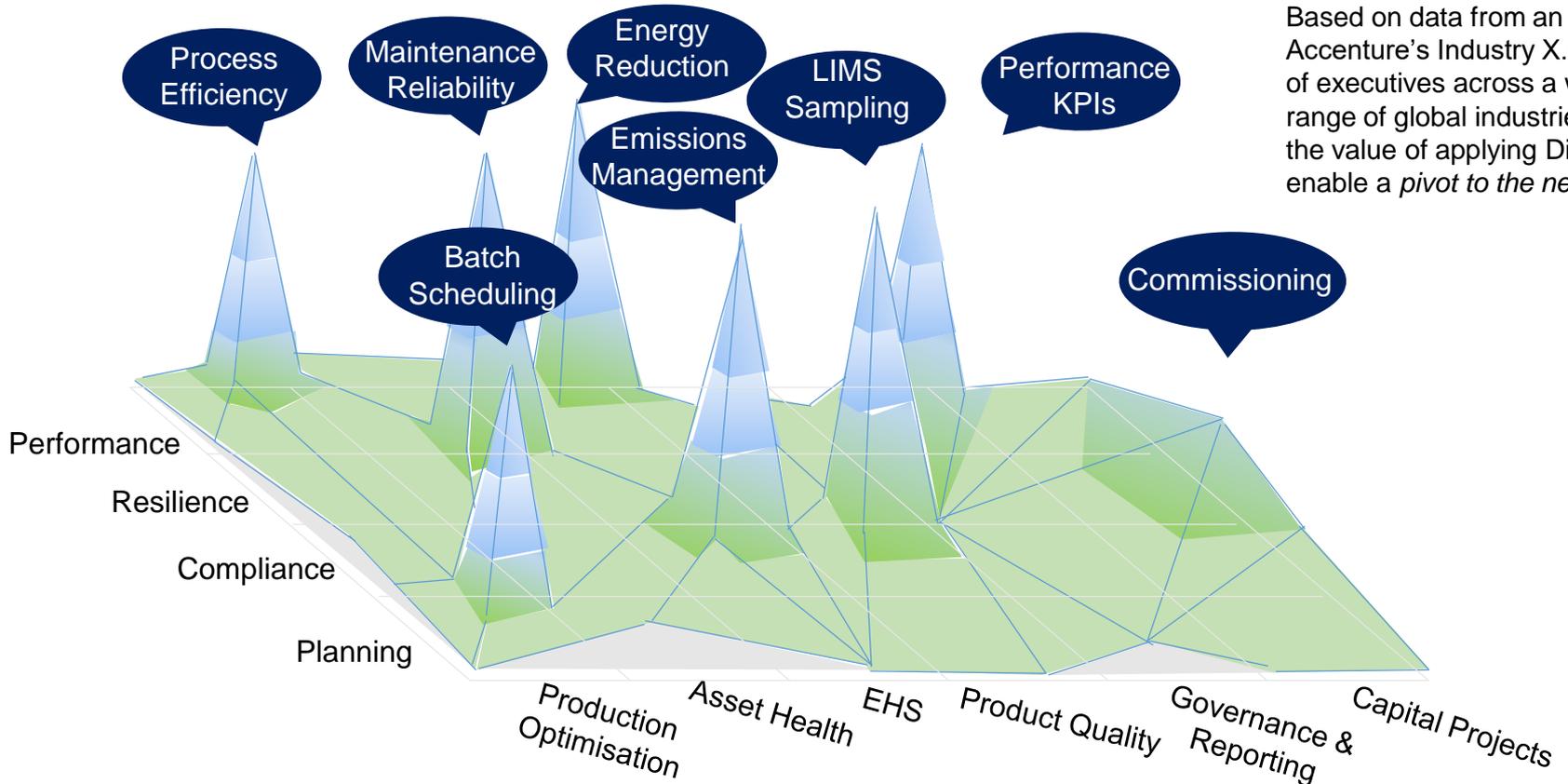OA combined multiple inputs to calculate *confidence* levels for a potential spill.

Event frames reduced workload & changed *reactive to proactive* spill management.

Reduced reporting effort with improved consistency plus potential for intervention

Value Framework

	Performance	Resilience	Compliance	Planning
Production & Logistics	① Energy Reduction			
Asset Health		② Proactive Maintenance		
EHS			③ Spill Monitoring	
Product Quality				
Governance & Reporting				
Capital Projects				

Value is Delivered through Action

START WITH THE DESIRED OUTCOMES

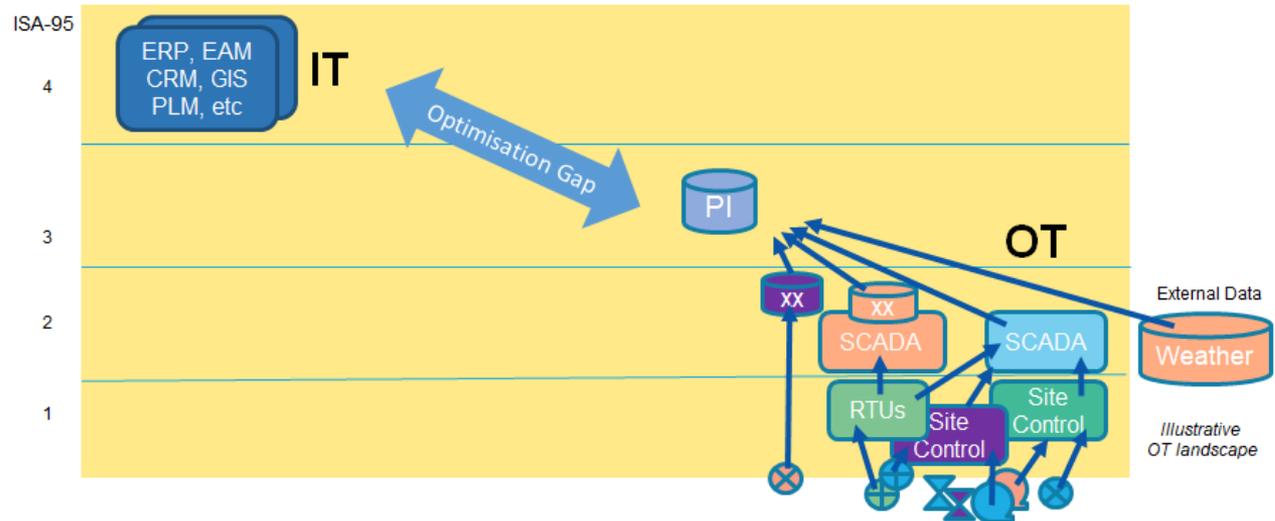| DATA & CALCS	INSIGHTS	ACTIONS	OUTCOMES
and only then worry about the data, calculations, models etc.	that will drive actions	and behaviours that will deliver the outcomes	that will drive value

Typical Starting Point …

*The Operational Analytics opportunity is to drive **day-to-day** optimisation*

Years & Months

Minutes & Seconds

Building a Trusted Data Layer

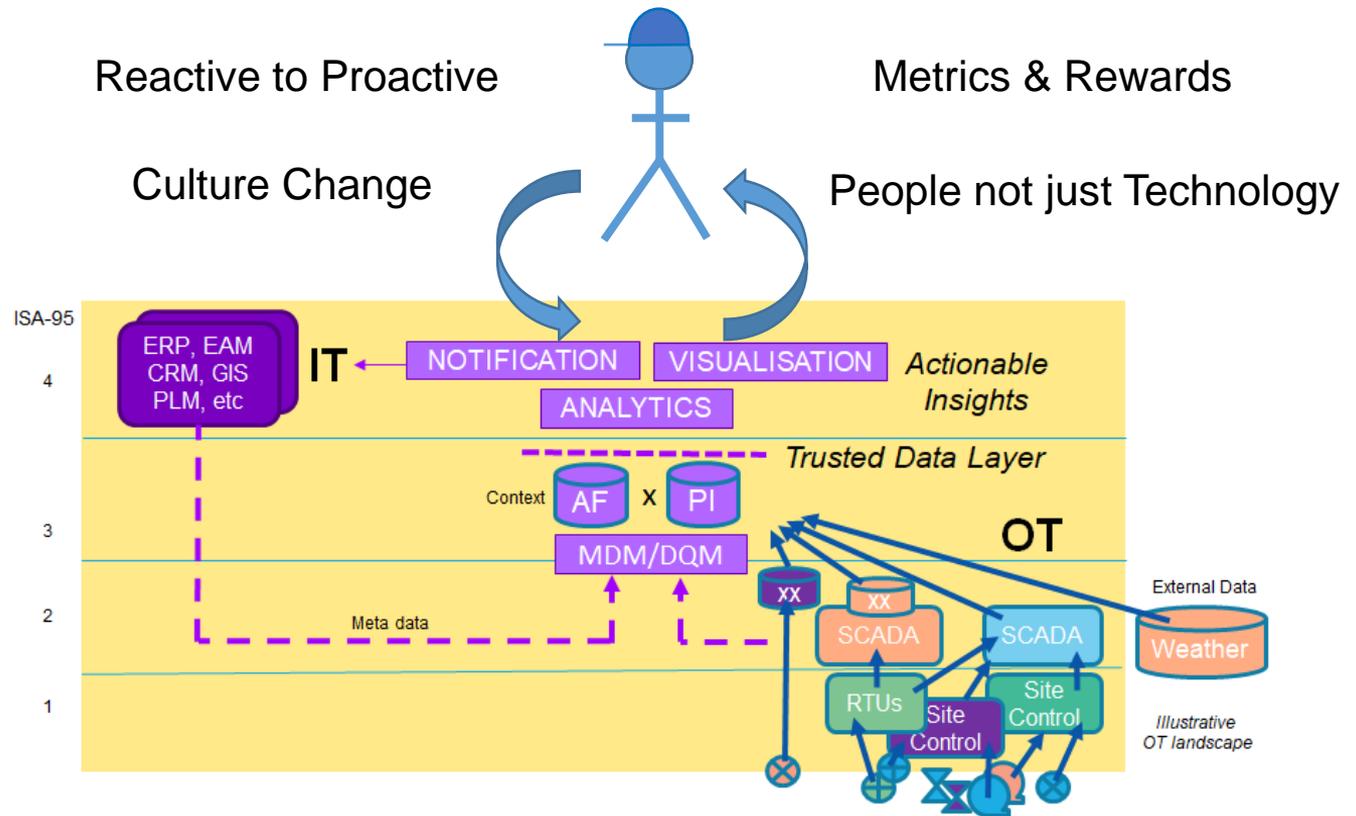**ESTABLISH AN EFFECTIVE OPERATING MODEL FOR SUPPORT**

- Data chain governance
- Mission critical monitoring & support
- Agile ways of working
- Risk/reward culture

ISA-95

ERP, EAM CRM, GIS PLM, etc — **IT**

Trusted Data Layer

Context — AF x PI

OT

MDM/DQM

Meta data

XX

XX
SCADA

SCADA

RTUs

Site Control

Site Control

External Data

Weather

Illustrative OT landscape

4

3

2

1
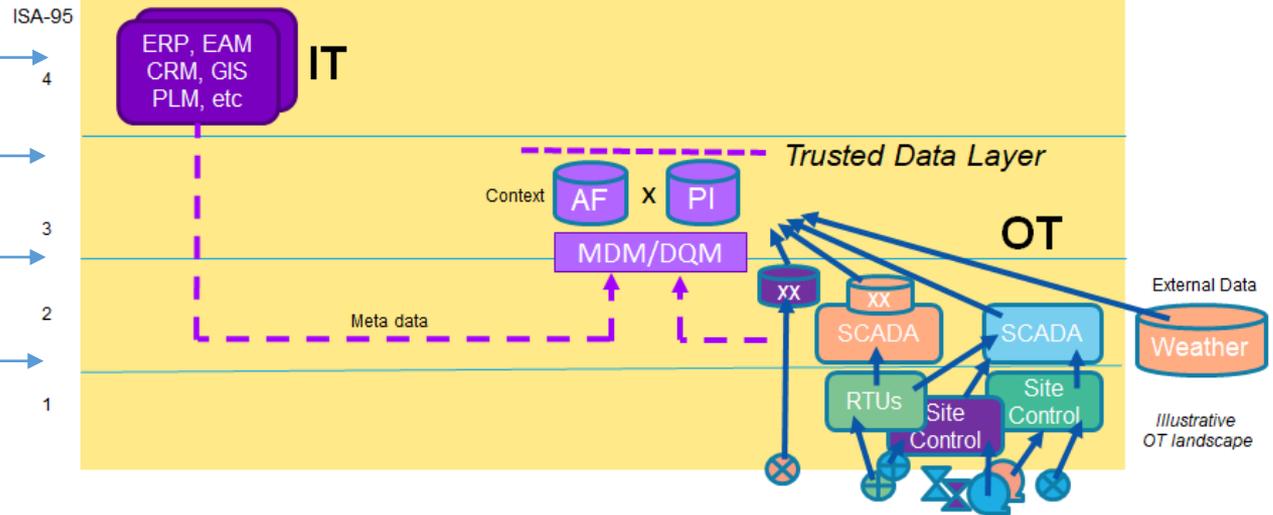
Turning Insights into Action

Reactive to Proactive

Metrics & Rewards

Culture Change

People not just Technology

ISA-95

ERP, EAM CRM, GIS PLM, etc

IT

NOTIFICATION

VISUALISATION

Actionable Insights

4

ANALYTICS

Trusted Data Layer

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XX

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Meta data

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SCADA

SCADA

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1

RTUs

Site Control

Site Control

Illustrative OT landscape

Building the Business Case

Benefits   vs.   Costs

Benefits

- Strategic Vision at Scale

- Intelligent Operations
    - Surveillance
    - Proactive
    - Predictive

- Insights into Action
    - Behaviours
    - Investigations & Interventions
    - Measurable Outcomes

Costs

- Build on what you have

- Commercials
    - Licence + SRP
    - Subscription / EA
    - PaaS

- Operating Models
    - Mission Critical Support
    - Data Chain Governance
    - Data Science Resource

Coriance

Driving operational performance across a *district heating company* using *"PI in the Sky"* to deliver *actionable insights* from legacy control systems and manual records

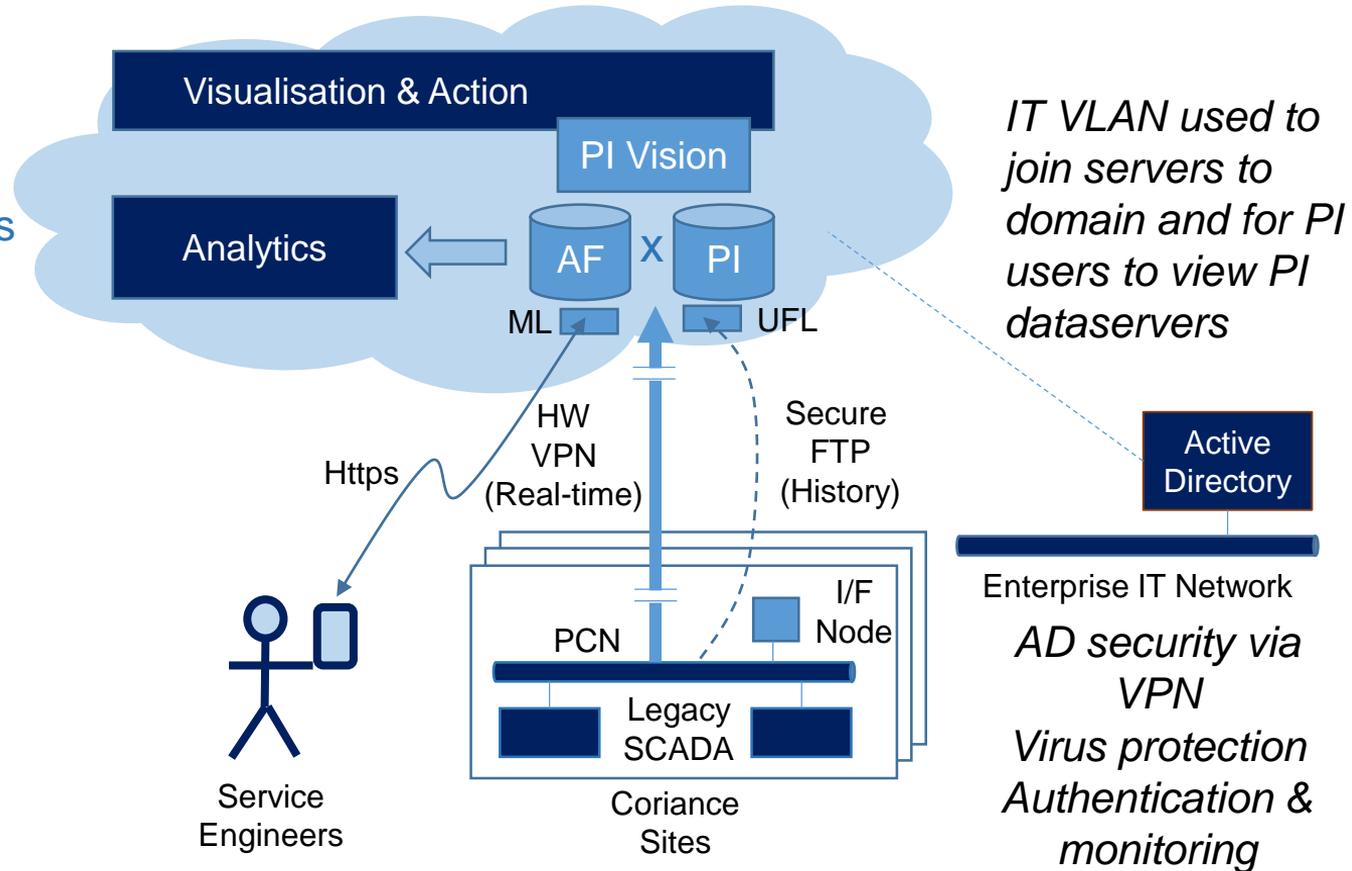| CHALLENGE	SOLUTION	RESULTS
• Legacy control systems across the plant portfolio • Manually intensive data capture and correction processes for reporting and management of performance	• Cloud Platform-as-a-Service enabled by the PI System on Microsoft Azure • Combining operational analytics with transformation to drive performance Improvements	• Real-time access to operational data • Automated and Manual data captured with one set of rules • Improved visibility is helping to achieve significant improvement in operational performance • Reporting automation

Solution Overview – *Platform as a Service*

Operational Analytics platform-as-a-service

Cloud based PI System has been set up as "edge to cloud" in a private Azure environment

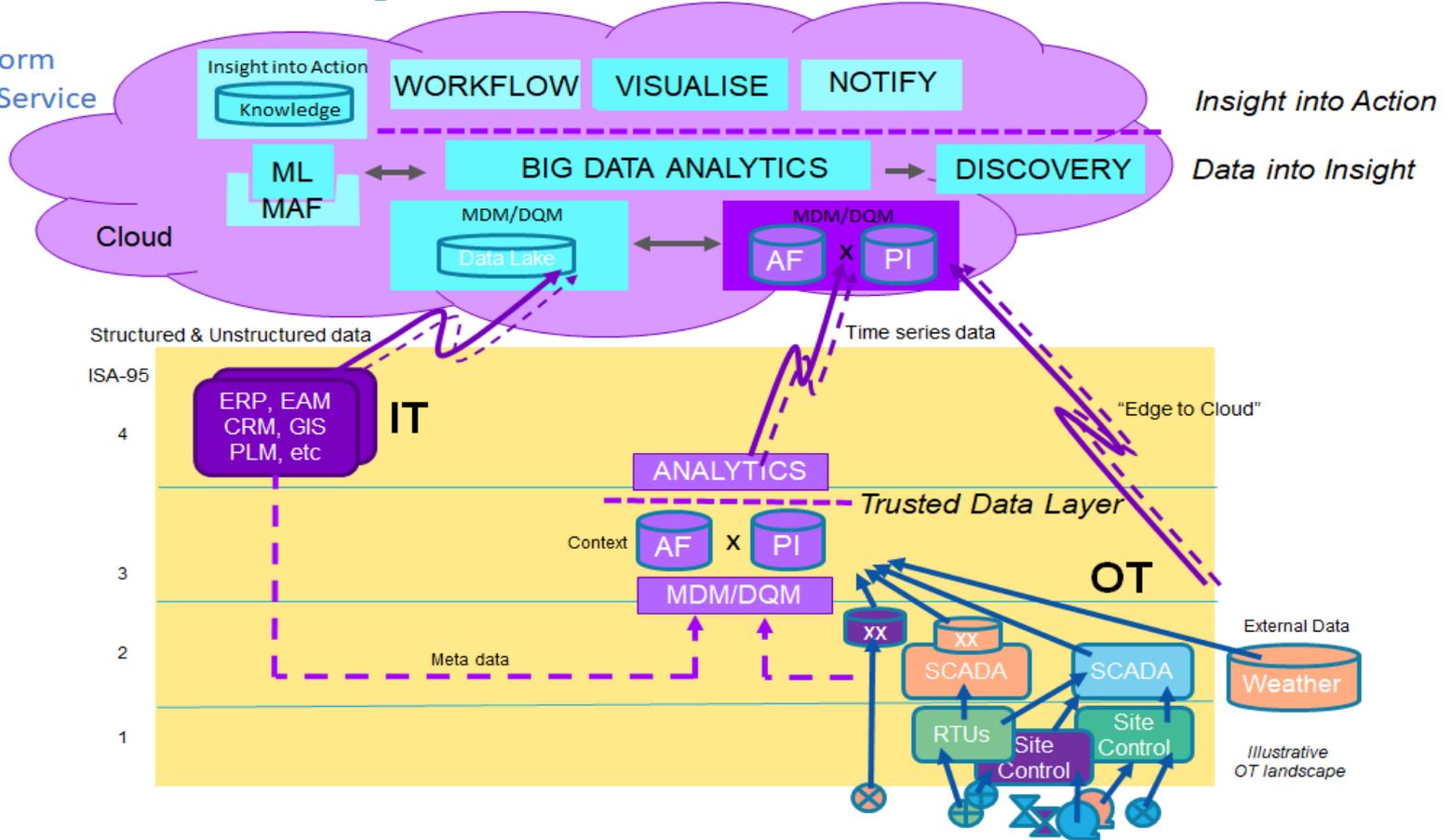Operational data collected through automatic and manual logger interfaces, and structured/validated using AF

Visualisation & Action

PI Vision

Analytics

AF X PI

ML UFL

HW VPN (Real-time)

Secure FTP (History)

Https

Service Engineers

PCN

I/F Node

Legacy SCADA

Coriance Sites

IT VLAN used to join servers to domain and for PI users to view PI dataservers

Active Directory

Enterprise IT Network

AD security via VPN

Virus protection

Authentication & monitoring

Delivering Improved Performance

Combining the operational data into a coherent dataset for each site is enabling operational analytics and business change to drive a step change in performance …

As the system becomes a business critical solution it has been important to set up effective monitoring, data validation and data chain governance

Big Data Analytics Platform

The Advantages of Deploying PI/AF Cloud Solutions

Storage
1 : 75 average compression versus typical data lake solutions

Trusted OT Data Layer
Resolve typical OT-specific data issues (drop-out, spikes, drift, bias, etc.) within a Data Quality Management layer

OT Data Discovery
In-built OT data discovery tools are easy and quick to use

Performance
Out of the box standard calculations (avg, max, etc.), models (steam, etc.) and Event Frames

Data Context
OT data needs context in order to properly interpret. AF provides a multi-hierarchy and templated approach to providing OT data taxonomy

OT Visualisation
Mimics and dashboards focusing on time-series data can be quickly developed and ported into strategic visualisation layer

Summary

Transformation with Realtime Data Infrastructure

It's all about delivering value

- Outcome > Action > Insights
- New Ways of Working and Culture Change enabled by Data and Tech

Build from a Trusted Data Layer

- Exploit the full range of OSIsoft components: PI, AF, EF, ML, etc.
- System Monitoring and Data Chain Governance are critical for success
- Provide Context and "good enough" Data Quality for the Outcomes

PI / AF are critical components for managing time-series data

- Even for Big Data Analytics cloud-based analytics!

Contact Information

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the mobile app for survey

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