Navigating the IT/OT Transformation Journey at Thames Water

Presented by **Nick Burkinshaw**
Simon Coombs

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About Thames Water

UK's largest water and sewerage Company with over 15 million customers

31,100 km of water mains including the London Ring Main

88 water treatment works

109,400 km of sewers

350 sewerage treatment works
7,500 sewerage pumping stations

4,500 employees
15,000 contractors

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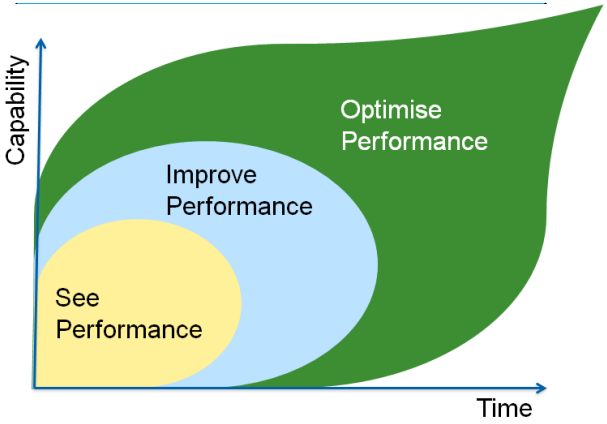
A new way of working, enabled by big data analytics and the PI System



COMPANY and GOAL

Thames Water, managing Water and Waste for over **15 million customers,** delivering operational excellence by turning **insights into action**

CHALLENGE

Fragmented systems, imperfect data, organizational silos in an increasingly complex environment

- Too difficult and time consuming to provide the required operational insights across the business
- Increasing regulatory performance targets within a regime to reduce cost to customer

SOLUTION

Combining business, external and operational data within a transformation programme

- Big data analytics, cloud-based platform delivering insights from imperfect data
- PI / AF solution as a resilient and trusted real-time, operational data layer
- New organizational models and a new way of working

RESULTS

Significant, £ multi-million savings over the 5 year investment period

- Reduced energy consumption across Water abstraction, treatment and transmission
- Increased Water quality
- Reduced number of Waste Pollution Incidents

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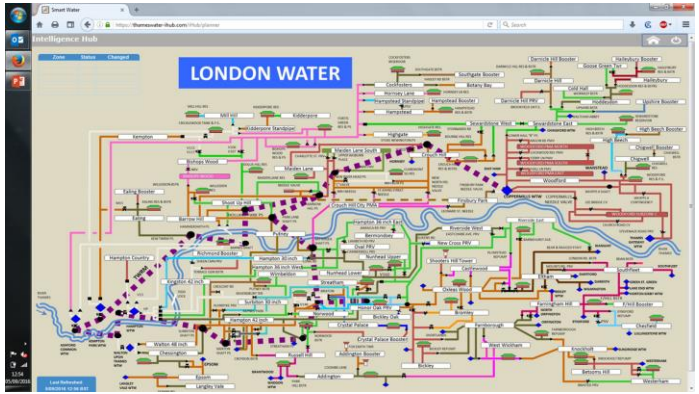
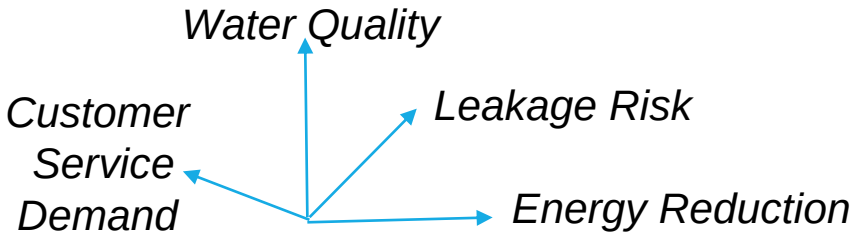
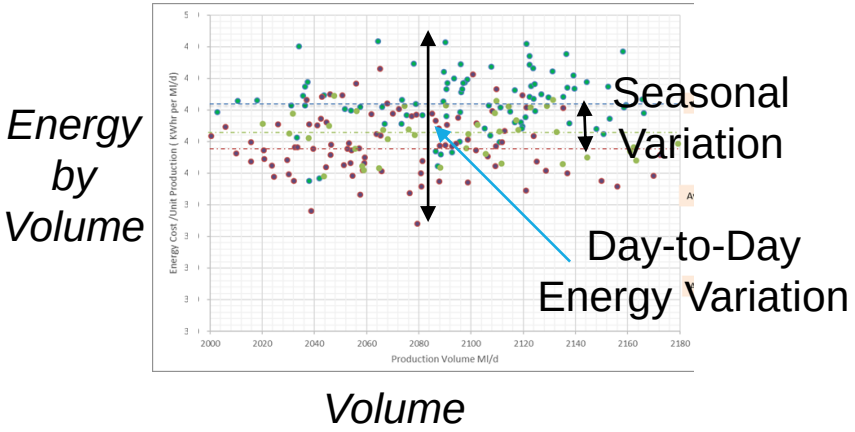
Water Benefits – Reducing Energy, Increasing Quality



Water Planners and Controllers need to juggle several conflicting drivers…





But, cost is dependent on reducing the Energy for abstraction, treatment and transmission

A focused and consistent approach across a combined Supply Organisation is reducing day-to-day variation and overall Energy used whilst maintaining Quality

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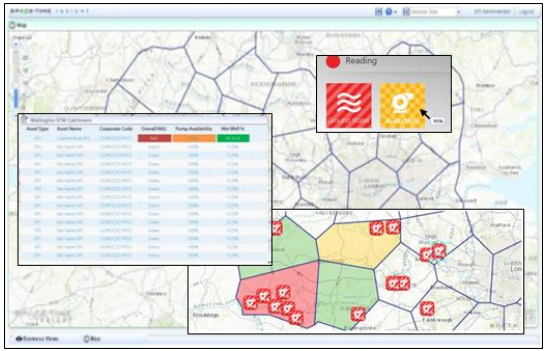
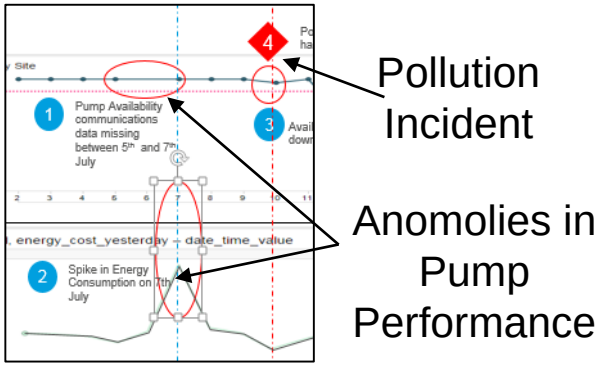
Waste Benefits – Reducing Pollution Incidents





Pollution Incident

Anomolies in Pump Performance

Understanding the relative risk of pollution together with anomalies in pump energy performance is being used to prioritise interventions…

Criticality = f(Impact, History, Resilience, Weather, etc.)

Performance anomalies can highlight imminent pump failure, network blockages or simply surges in the waste network

Collaboration between the Network Controllers and Field Engineers is reducing the number of pollutions – and additionally saving wasted energy

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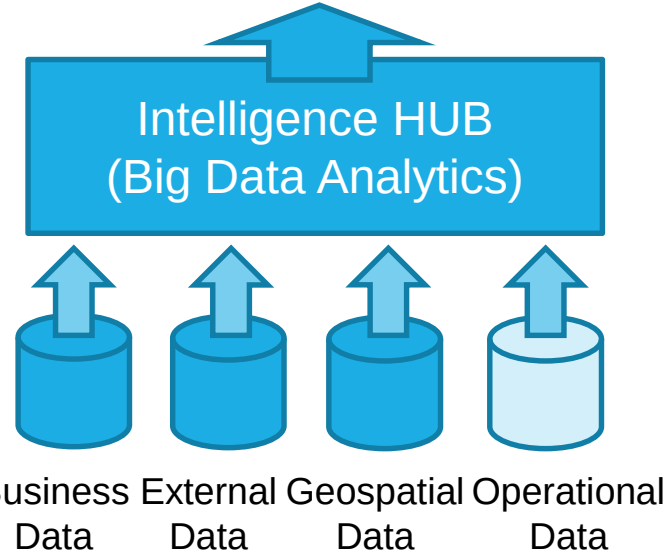
Benefits are delivered by turning *Insights into Action*

Insights



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Transformation

- New organisation models
- Clear responsibilities / accountabilities
- Performance objectives
- Incentives
- …

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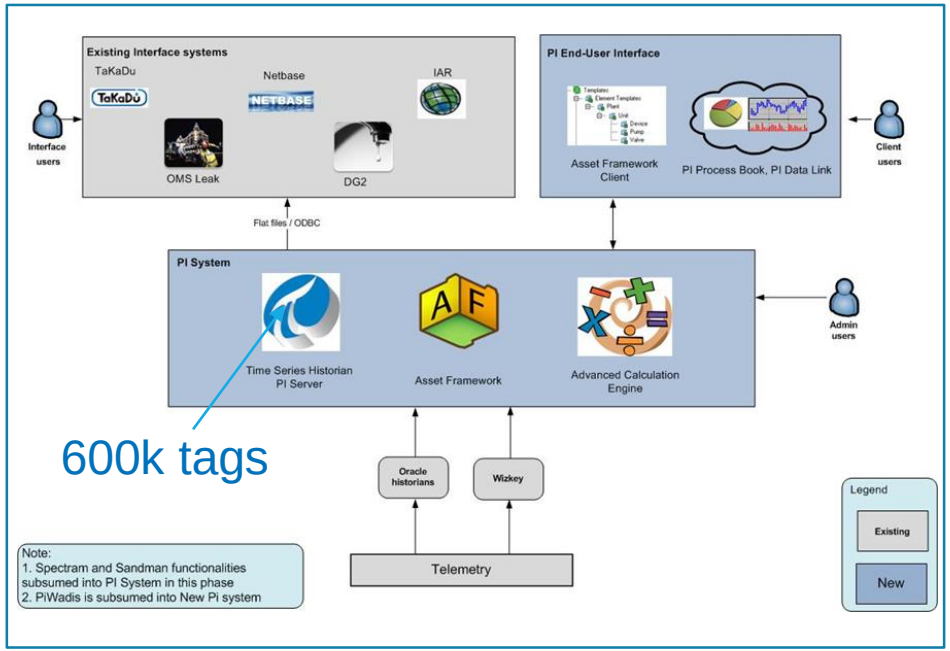
PI System Architecture - we started with good intentions…

"AORTA"

Asset and Operations Real-time Analytics

The vision we presented in 2012



We started the PI System journey as a replacement for an old, small Operational Management System

In practice Thames has over 5 million potential operational signals across control, monitoring and metering accessed via sometimes very slow network communications

It was has been difficult to work out which data to pull into the PI System, and complex and time-consuming to implement changes

As a result, we focused on migrating as a PI Historian – leaving, at that time, the context and analytics complexity to be handled by IT

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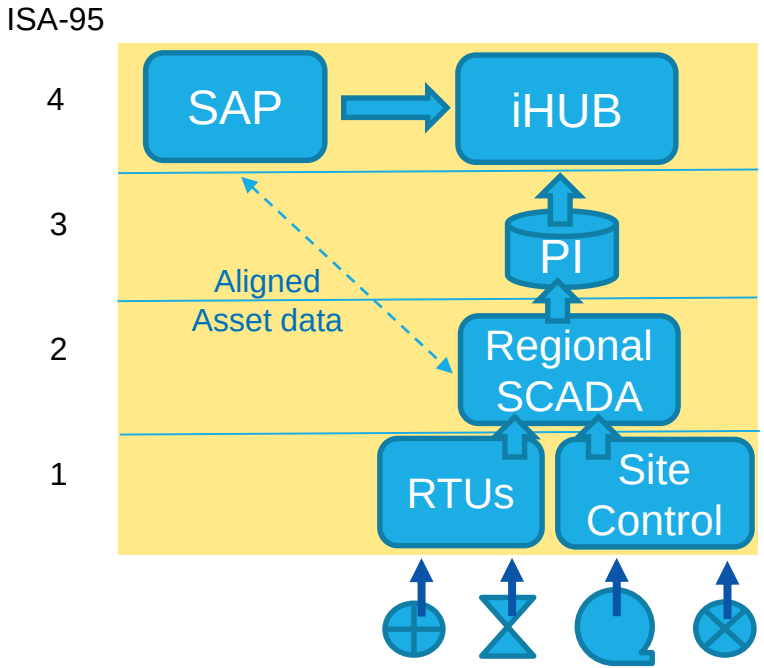
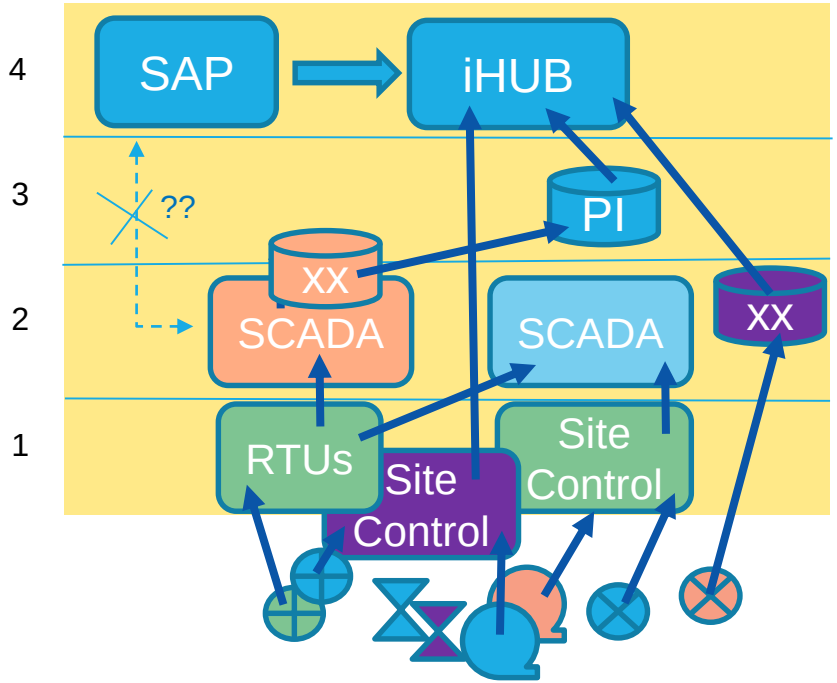
IT/OT Convergence – Theory versus Reality

Our Vision Assumed…



Today's Reality …



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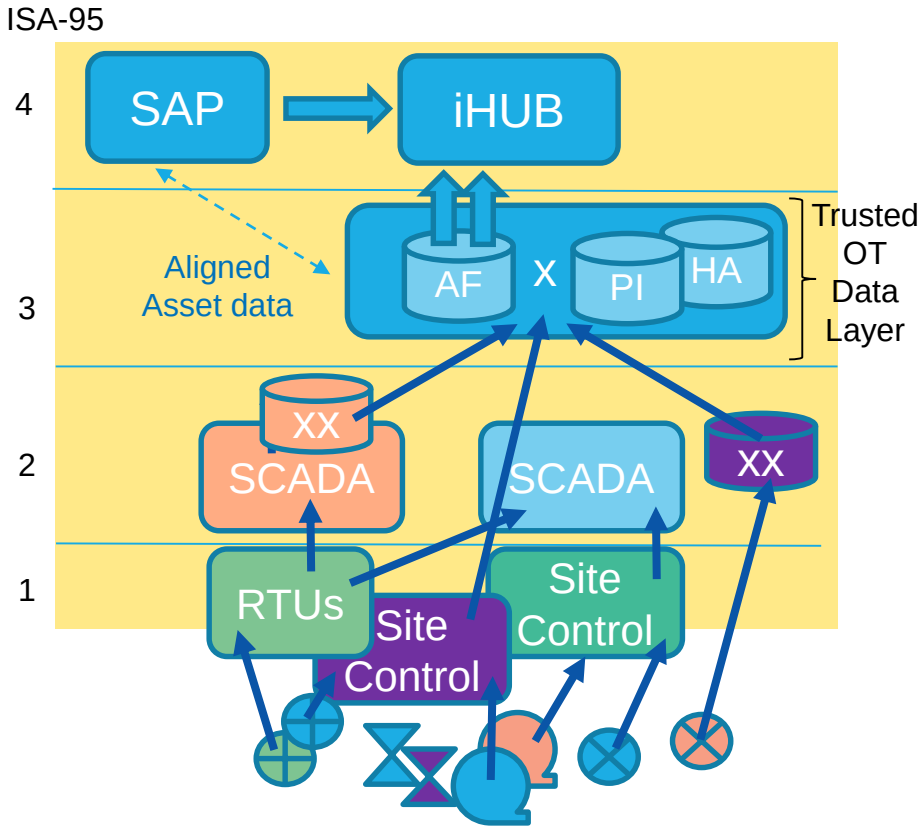
Key next steps for the PI System journey in Thames Water



We have realised that we need a trusted real-time data layer to provide the bridge between IT/OT

AF - Bridging between Tag-centric and Asset-centric view

HA – Resilience in line with mission critical data role

Collector Interfaces – improve latency and connection

PI Integrator for Business Analytics (Data Warehouse edition) – simplify connectivity between PI AF and iHub plus PI Web API for fast snapshots

Security – improved role-based security

Data governance – change control, synchronisation

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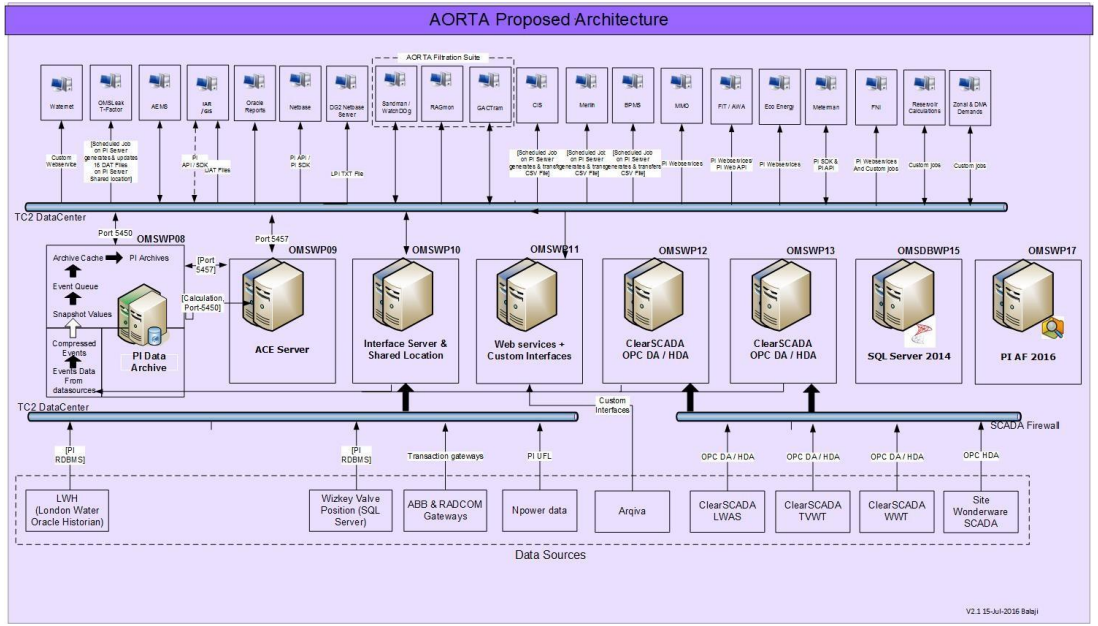
We are now moving to an OSIsoft best practice vision

This will ultimately reduce cost to deliver and support – and provide a more robust source of real-time data for iHub to provide *Insight into Action*



We're delivering this in true partnership with OSIsoft and our Technology & Transformation Alliance

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Conclusion - Key Lessons Learnt

Insights without Action do *not* deliver Value

- *Combining Transformation with Technology is critical*

In practice the OT landscape will remain complex and fragmented

- *Enterprise-wide, real-time data infrastructure as a "trusted OT data layer"*

OSIsoft provide the critical building blocks to deliver this trusted layer

- *Use them! The PI System is more than just a Historian…*
  - *AF - operational data context, data calculations, event frames*
  - *PI HA - resilience and high availability*
  - *Connectors and Integrators*
  - *PI Coresight - real-time data insights embedded into your organisation*

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谢谢

Danke

Gracias

Merci

Thank You

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Спасибо

Obrigado

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