The Collaborative Supply Chain

Presented by **Nick Ward**
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Predictive Equipment Health Management

The collaborative supply chain

"The industrial market is recognising the benefits of advanced analytics to predict equipment failure or loss of performance. To get the best from this approach, operators and remote diagnostics providers need to collaborate to combine the strengths of both groups. The Connected Supply Chain model from OSIsoft is a great approach to help make this happen."

Osys

Business Challenge

- Risk-based maintenance requires predictions you can trust
- But the service models create silos, preventing deployment of effective analytics

Solution

- Pool the expertise, working on one virtual data set
- Enabled by OSI Connected Supply Chain

Results and Benefits

- Effective prognostics and diagnostics
- Underpins a risk-based maintenance strategy
- $$$ in transformational value

About OSyS

- **Optimized Systems and Solutions**
  - Founded in 1999
  - Part of the Rolls-Royce Group
- **350+ Customers Across Multiple Industries**

- Predictive Equipment Health Management
- Process Assurance and Compliance
- Operational Optimization
- Maintenance Management

Over $50 billion in asset value utilize OSyS solutions

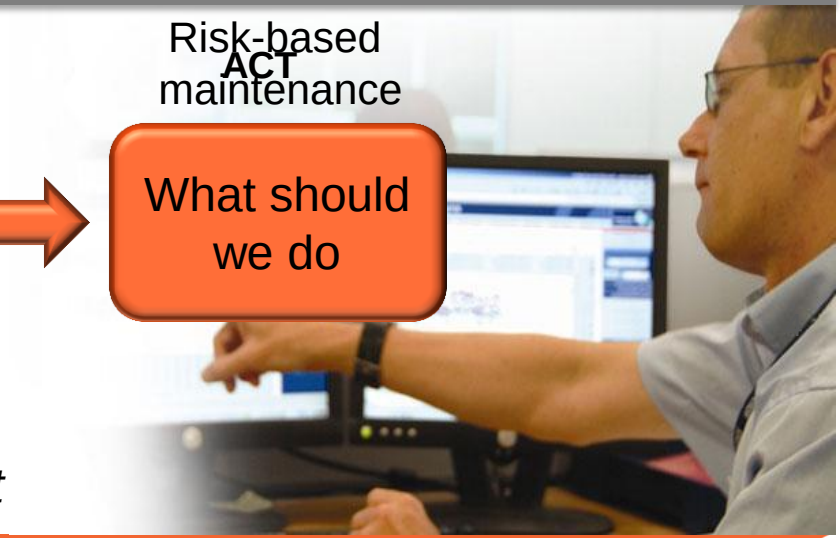
Centralize, analyze and act on globally distributed, high-frequency equipment data to drive informed business decisions

OSIsoft.

ANALYSE Advanced analytics & prognostics

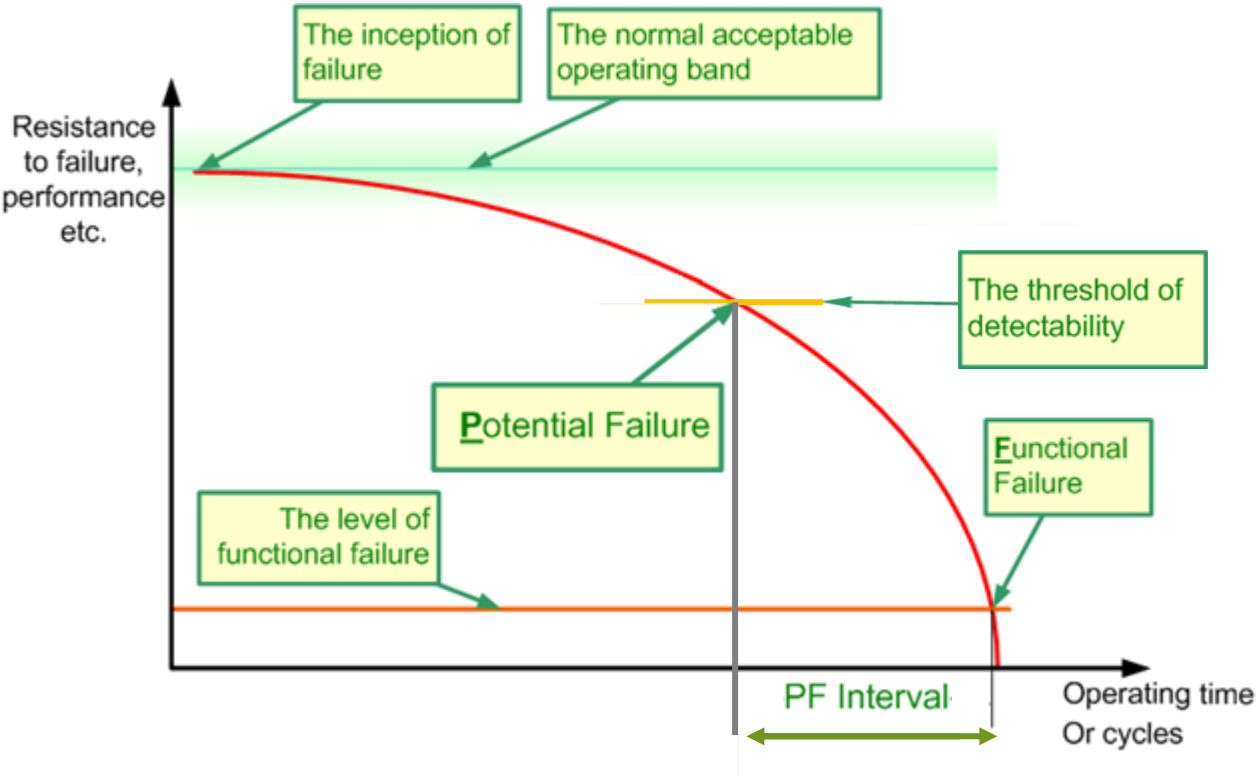
ACT Risk-based maintenance

What is happening → What will happen → What should we do



If we know what is likely to happen, we can plan to prevent it, or plan to reduce its impact

Chasing value



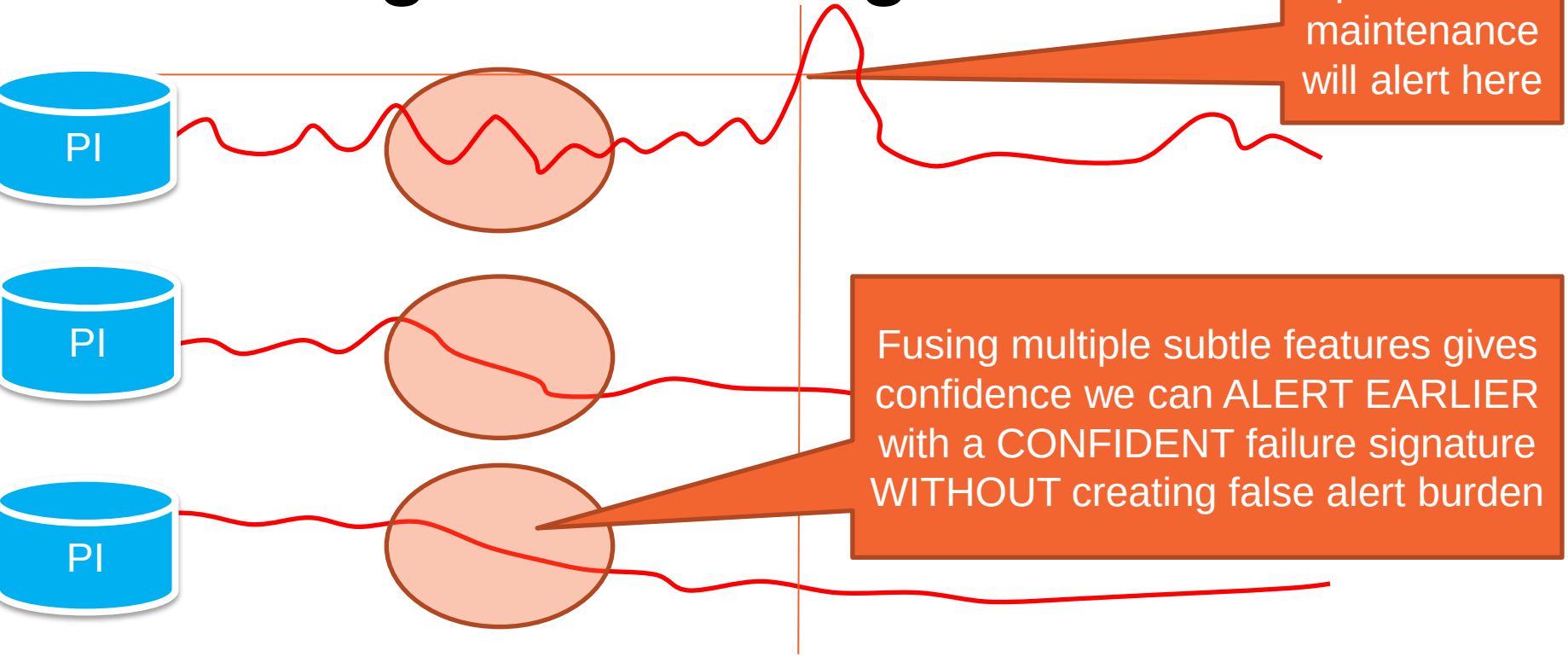
Value is driven by

- **Detecting earlier**
- With a **confident diagnosis**
- And **minimum false alerts**

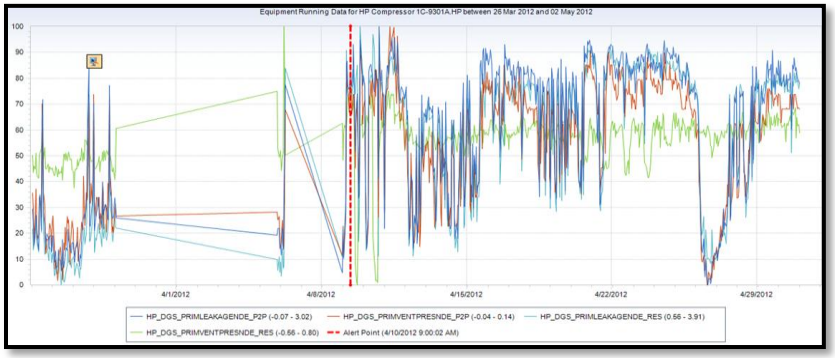
- Longer detection intervals drive better mitigation planning

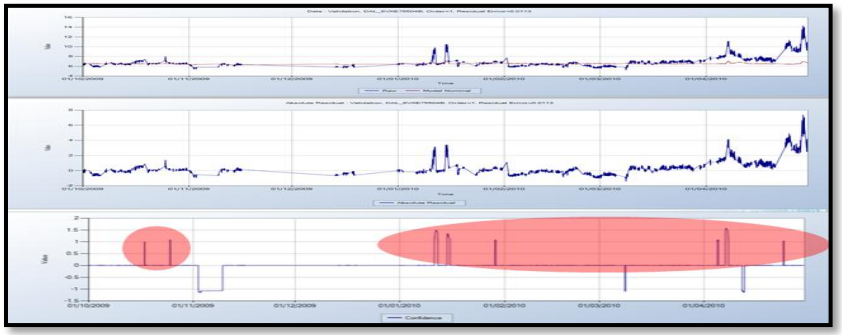
- But only if alerts are trusted

Increasing the warning interval



examples



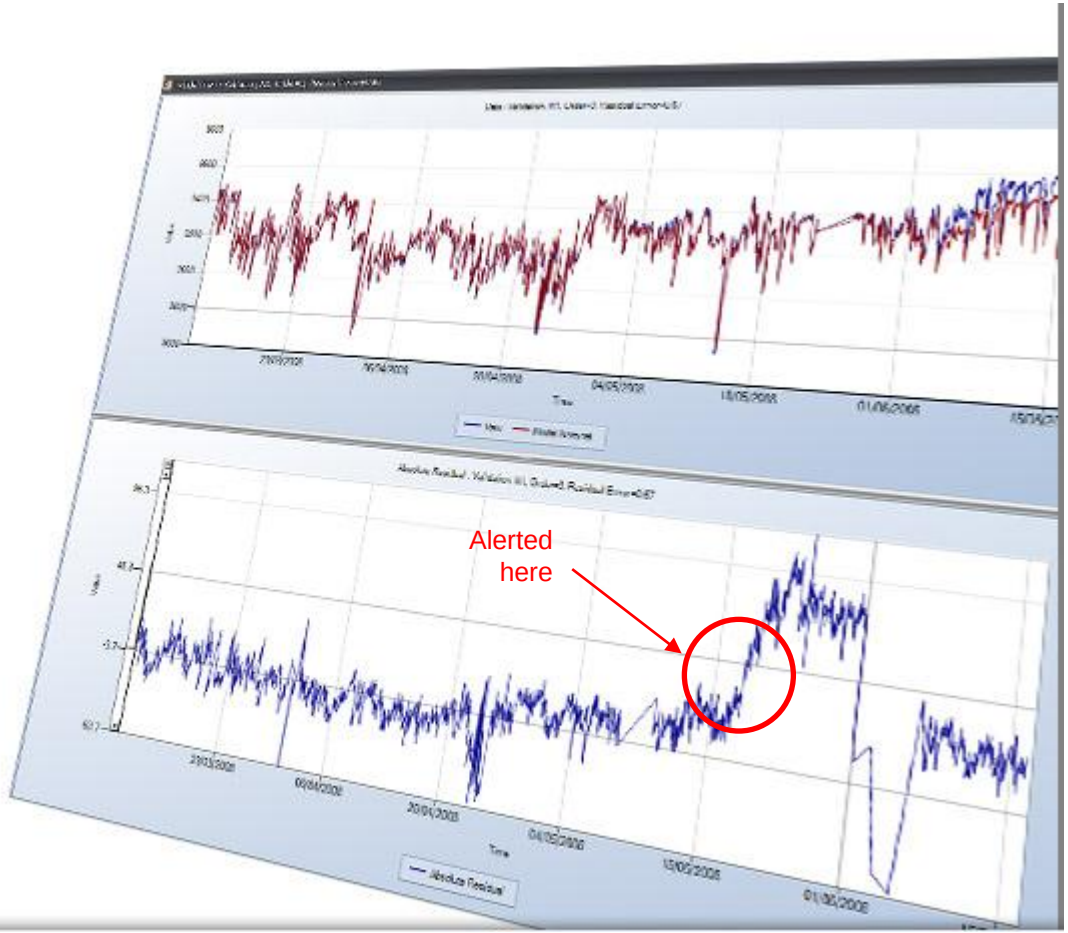


- Dry gas seal failure
- 3 weeks warning

- Pump seal failure
- 6 months warning

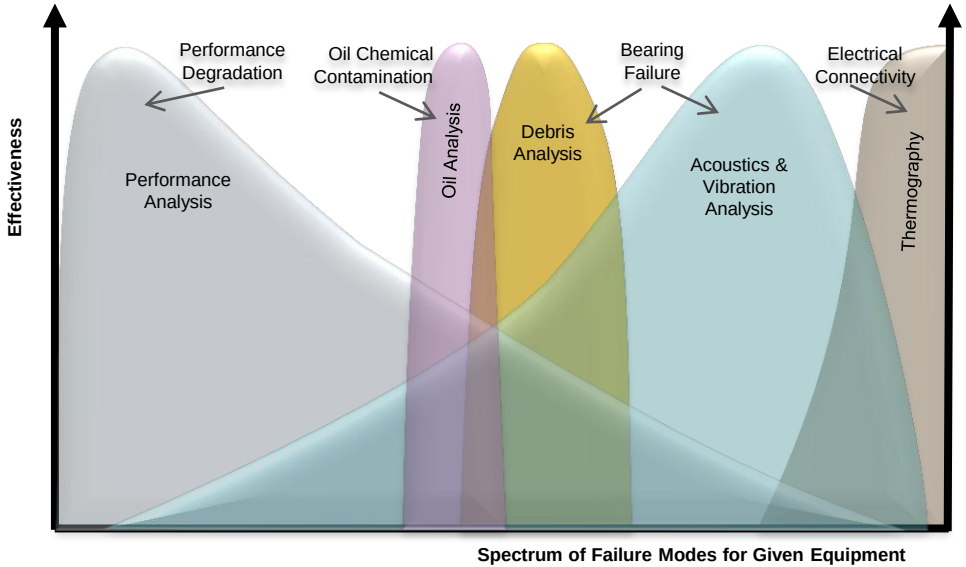
examples

- HP turbine blade damage
- 3 major events missed by online vibration monitoring
- 2-5 weeks warning



So advanced analytics works…

- Fuse indications from multiple parameters across multiple detection technologies
- Know what to look for and tune accordingly
- To be successful you need:
  - The data
  - The operational problem
  - The analytical toolbox and skills



But requires careful application to be effective & trusted

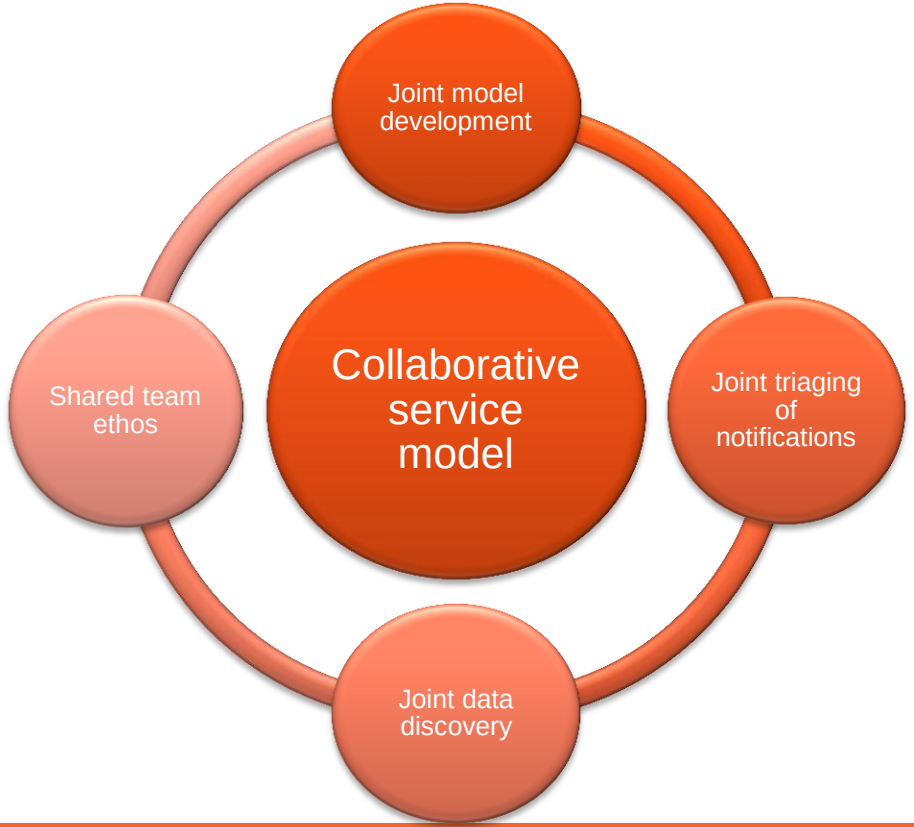
Constraints of current service models

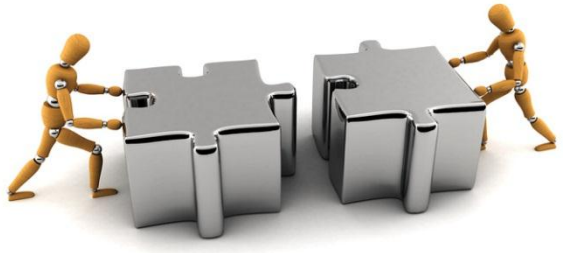
1. Managed by the plant		2. Managed by a service provider
The data		**The data**
✓ Local	⟷	✗ Some local data, not enough or timely
✗ Global fleet	⟷	✓ Global fleet
The operational problem		**The operational problem**
✓ Close to the business	⟷	✗ Distant from the operator's goals
Analytic toolbox & skills		**Analytic toolbox & skills**
✓ Strong engineering domain		✓ Strong engineering domain
✗ Rigid tools – closed systems	⟷	✓ Agile tools – able to prototype
✗ Expertise limited to the site or organisation	⟷	✓ Scalable expertise

RESULT:

- *Advanced analytics do not thrive*
- *Implementations get stuck at the low-hanging fruit*
- *ROI is not realised, frustration and lowered expectations*

Collaborative services is the best of both





- Close to the business
- Strong engineering domain
- Access to global learning
- Scalable services
- Open data, open systems

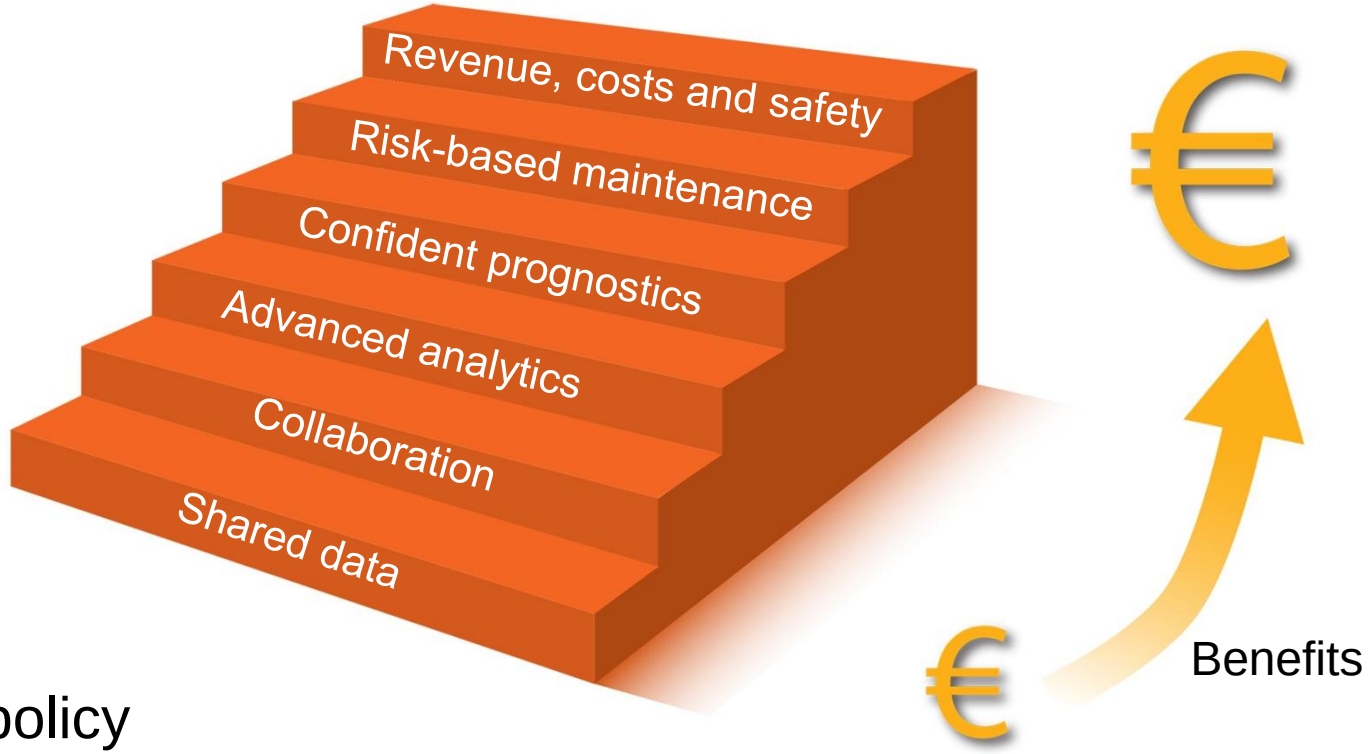
We need a shared data infrastructure.
I wonder who can help with that?

- PI Cloud Connect will connect us on a transaction level with customer data
- We can seamlessly republish derived data back
- We can simultaneously work on the same virtual dataset
- We cut the time to address new issues by months, even years

Why is this important?

API 691

Risk-based equipment management

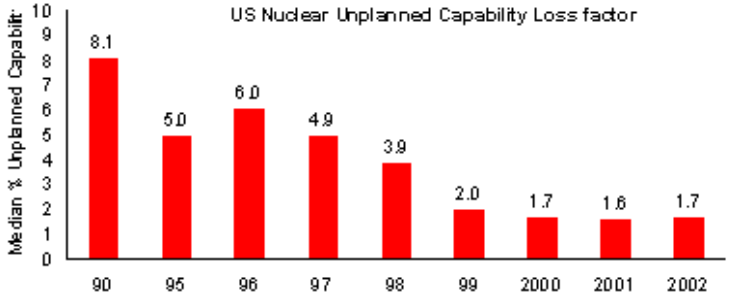


Not just an insurance policy

Aerospace & nuclear have led the way

- 10 years ago Rolls-Royce transitioned to a risk-managed service business
- Underpinned by advanced analytics to manage 12,000+ jet engines & industrial equipment
- Predicting 10x more benefits to come

600% share price growth since 2009



Source: WANO

20 years ago the nuclear market switched to a risk management ethos & every KPI shows the improvement

- Production Costs decreased by 45%
- Capacity Factor increased from 75% to 92%
- Refueling outages reduced from 105 to 37 days
- Safety reportable events reduced by > 80%

Now dealing with obsolescence and an aging expert workforce

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