Leveraging OSIsoft PI Data to Assess Asset Health and Prevent Unplanned Outages

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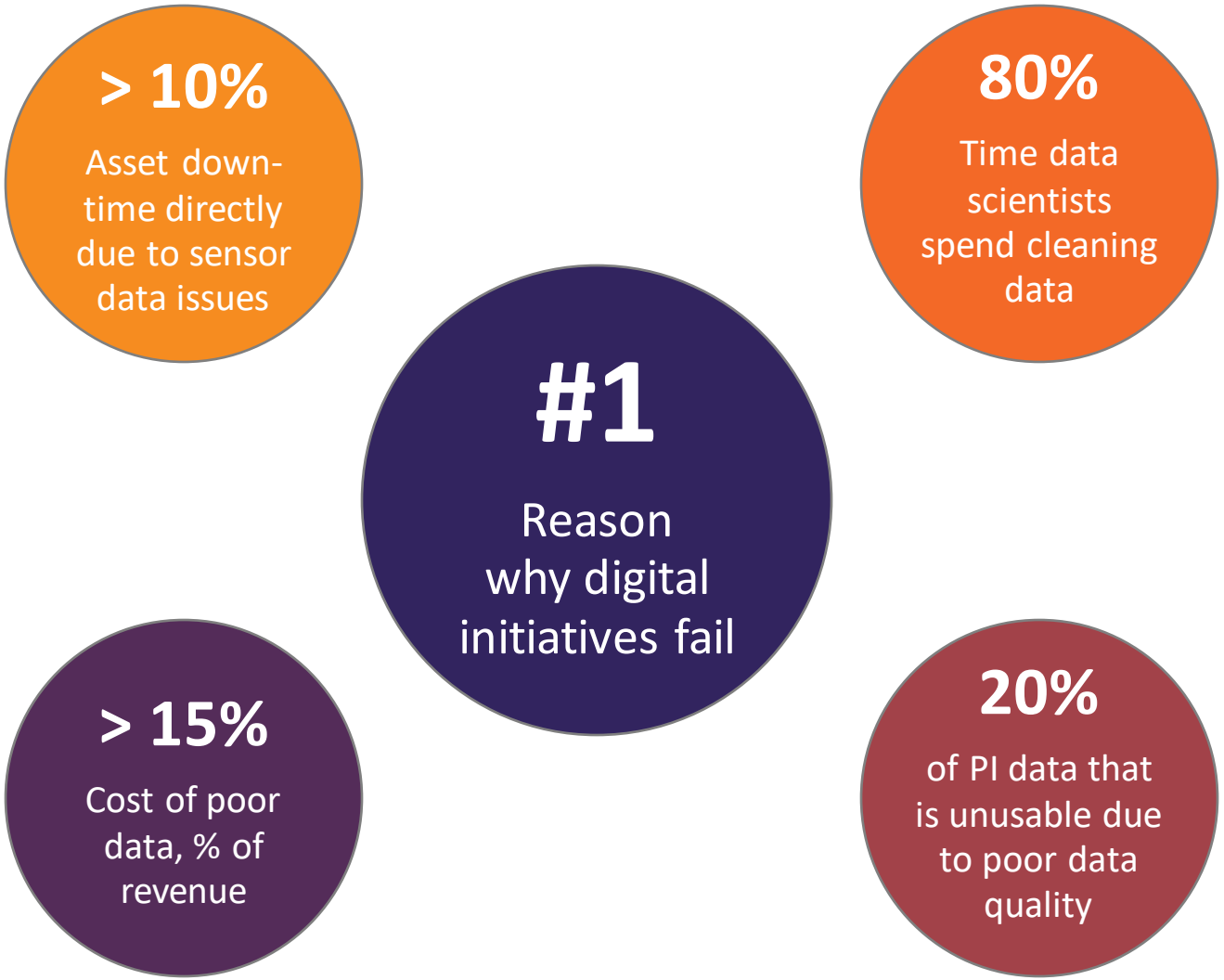
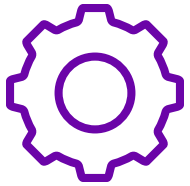
Poor Data Integrity is a really BIG problem



CHEMICALS

World-class chemical operations



Challenges

- Identify sensors that are failing or have bad data, specifically in redundant sensor pairs
- Improve OEE by predicting asset failures by distinguishing sensor failures from asset failures

Solution

- Establish data integrity for 450K tags (3 historians covering 30 sites)
- Integrate APERIO DataWise with AVEVA PI Asset Framework (PI-AF) and other 3rd party and in-house tools for predictive maintenance and advanced analytics

Expected Benefits

- Validated data for the entire analytics tool stack
- Accurate prediction of asset failures
- Insights into asset vs sensor failures
- Potential alerting for use by operations

Covestro’s in-house solution

PI-ACE Application – Redundant Sensor Diagnostics (RSD)

Advantages

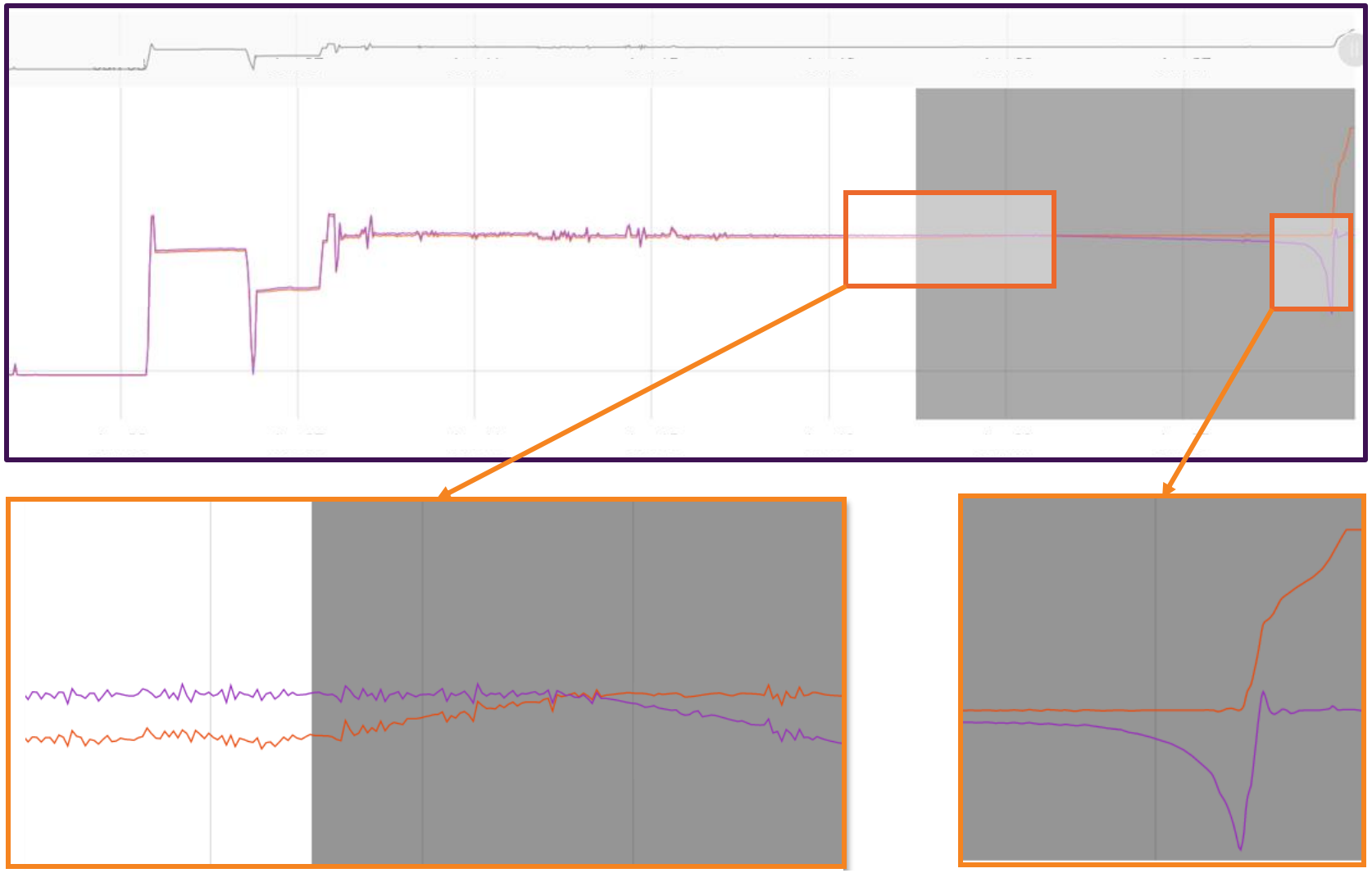
- Ability to view some simple metrics for redundant sensors
  - Flat line data and offset alarms
- Advanced indications like fouling
- Based on robust cross-correlation methods

Disadvantages

- Only three metrics were monitored
- Scalability
  - All sensors had to be manually deployed
  - Pairs that were just similar required extra effort
- No further insight into sensor health.
  - If two redundant sensors diverge, which one is correct?

Redundant Sensor Failure Example

APERIO DataWise accurately predicts which sensor is wrong by analyzing a small group of tags and determining which one breaks correlation



CV_XXXXX.PV **breaks correlation** at the start of shaded area and incorrectly does not show the decreasing nature of the metric

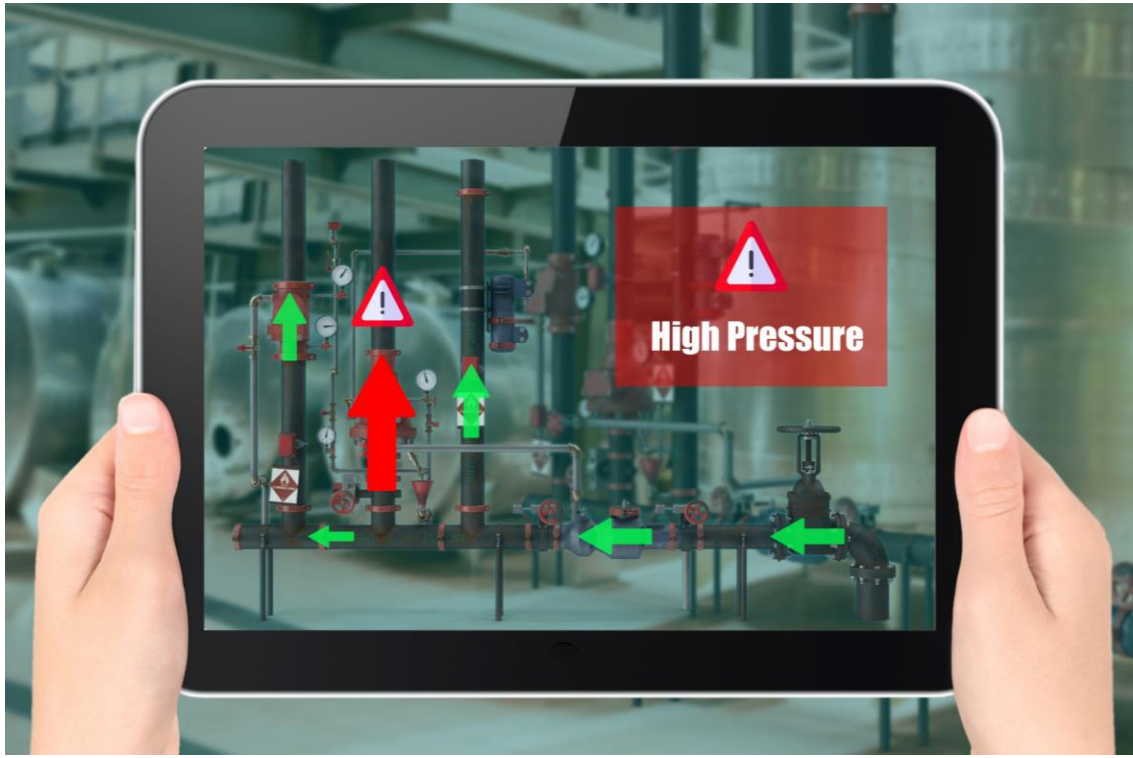
Undetected sensor malfunction leads to **asset breakdown**

Path Forward

How will we measure success?

Apply predictive analytics to:

- Reduce unplanned outages
- Reduce maintenance repair costs, including
  - Labor
  - Material
  - Preventative maintenance



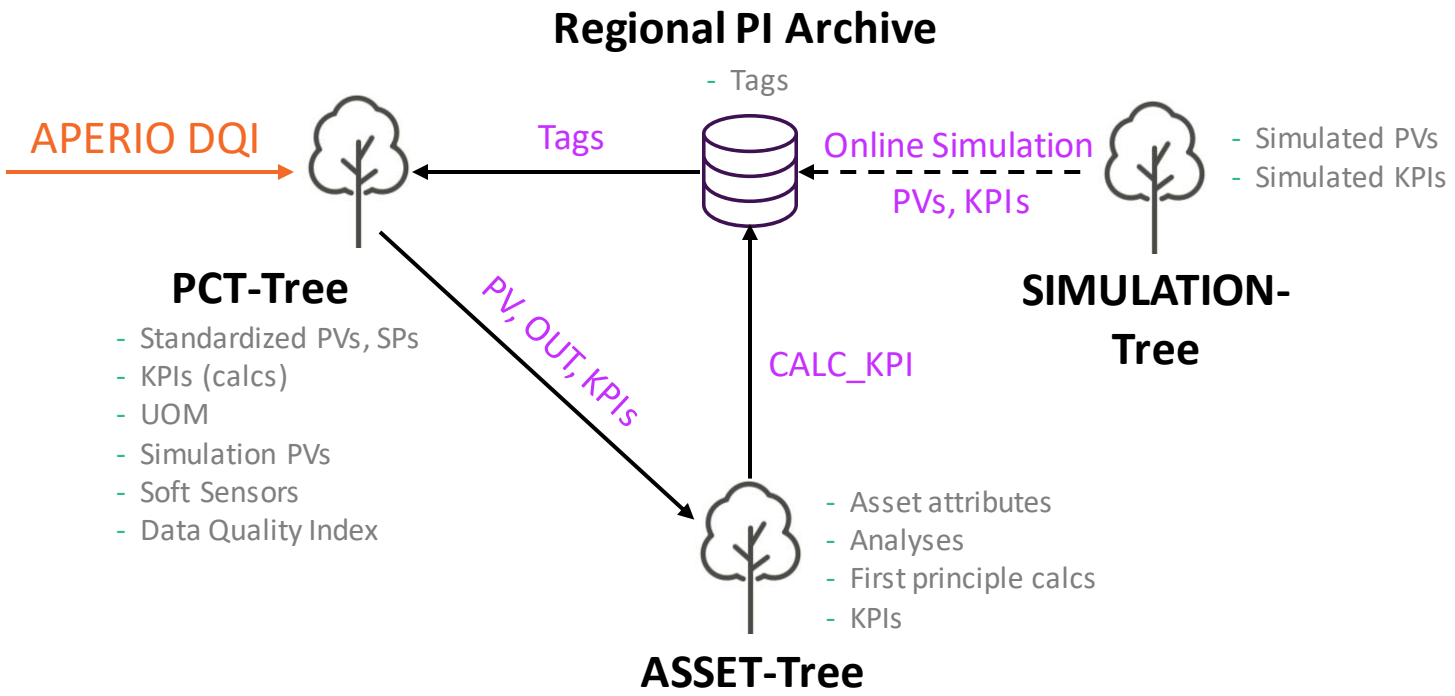
Path Forward

How will we accomplish this?

- Use APERIO DataWise to provide scalable, site-wide insights on data quality and sensor health
- Integrate APERIO into PI-AF to determine best source of data

Integrate into the PCT Tree Function

- Use APERIO Data Quality Index (DQI) to flag/remove bad sensor data
- Choose an alternative source of data, if appropriate



Source and impact of most data problems

Detecting sensor failures

Noise Changes

Identify noise changes relative to its history. The engine focuses on the energy of the signal noise.

Correlated Signals

Detect changes in multi-channels correlation level over time, per its history, i.e., due to sensor drift

Detecting PI data problems

Missing or Bad Data

Missing or bad data from sample rate changes, a constant signal for an abnormal duration, or mismatched data, relative to the history

Stale or Dead Tags

Identifying these free up tag counts or reminds you to update tag descriptors. Identify these at the source rather than in critical models.

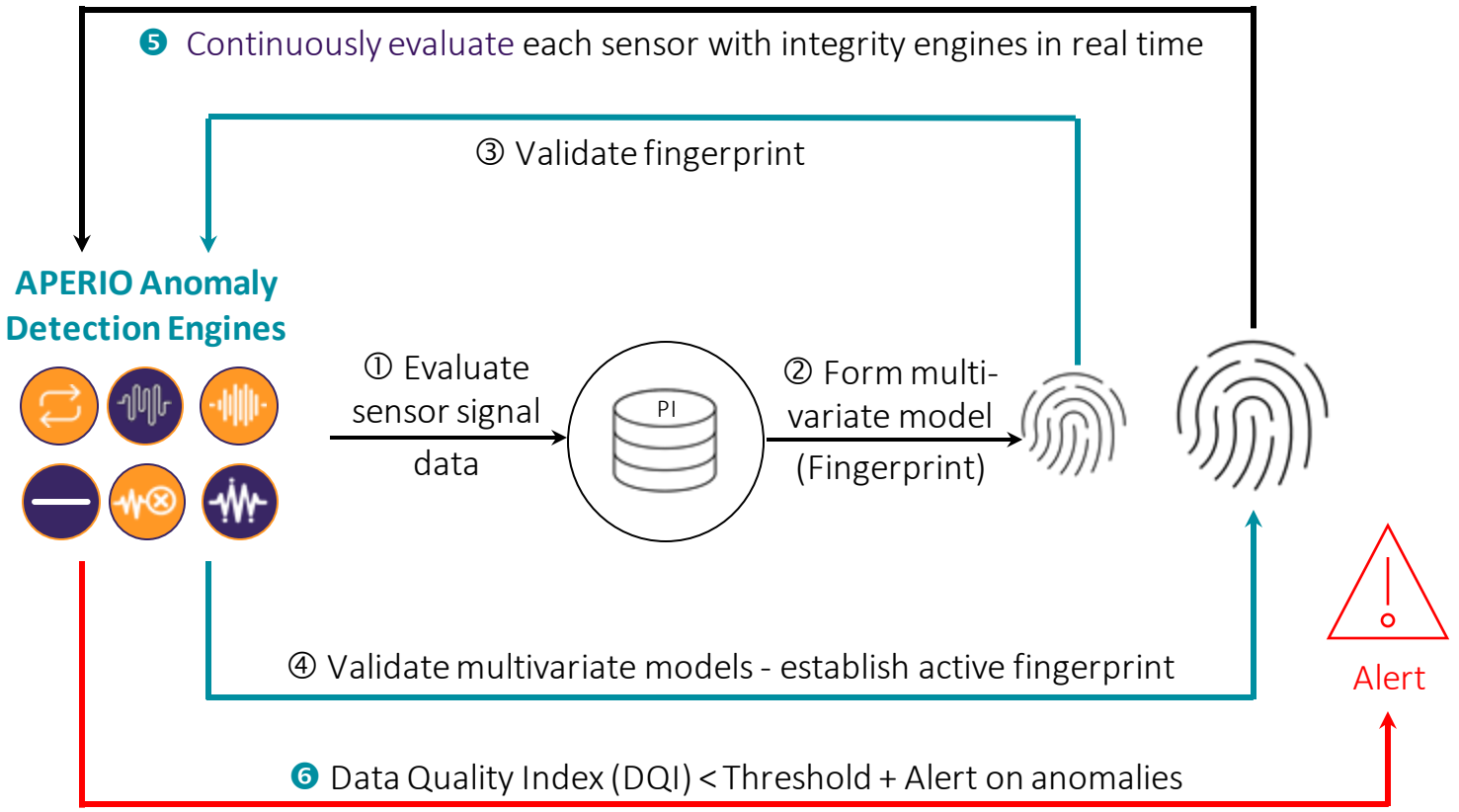
Data Out of Range

Values that fall outside their typical range, relative to their history.

How does APERIO DataWise work?

APERIO DataWise:

- Proactive and at scale
- Automatic anomaly detection
- Quantifiable data quality
- Contextualized alerts
- Continuous monitoring



Accurate, reliable data always

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Questions?

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State your name and company.

Please remember to…

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Thank you!

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