



XSIGHT & Industry 4.0

Industrial Analytics

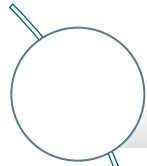


AUTOMATION
INSTRUMENTATION
SUMMIT 2018

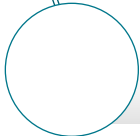
Josh Ferrara
Claudio Nespoli

Castello di Belgioioso 4 Luglio 2018

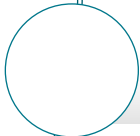
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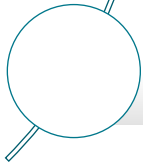
1. XSIGHT - DIGITALIZATION APPLICATIONS



2. WHY



3. HOW



4. CASE STUDY

1. XSIGHT - DIGITALIZATION APPLICATIONS

■ Operation and Maintenance



- *Predictive Maintenance*
- *Neural Networks*
- *Machine Learning*

■ Cognitive Engineering



- *Machine Learning*

2. WHY - O&M issues, needs VS wants

Operation and Maintenance Opportunity: WHY?



**Production
Enhancement**



**Optimization Workforce &
Safety Improvement**



**Quality Product
Improvement**



**Reduce Maintenance
Cost down to 75% (*)**

(*) included downtime
reduction

2. WHY - O&M Issues, Needs VS Wants

WANTS

1. *Increase Quality of the Asset*
2. *Better ASSETS performances*
3. *Reduce O&M costs*

Efficiency

NEEDS

1. *A “data oriented” Process*
2. *Effective Configuration Management*
3. *Enable a Predictive Maintenance Programme*

**Data &
Analytics**

3. HOW - XSIGHT Division – Industry 4.0

Technological breakthroughs

Big Data

Advanced Analytics

IoT – Internet of Things

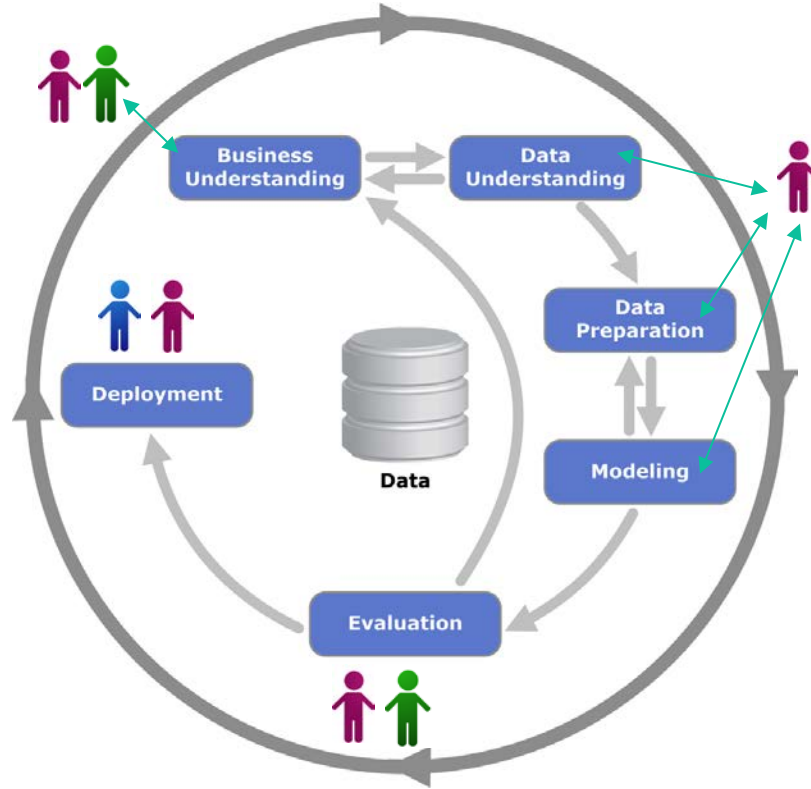
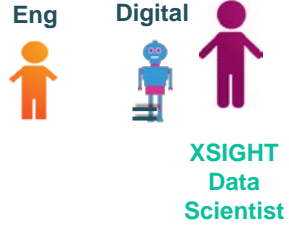
Machine Learning

Cognitive Intelligence

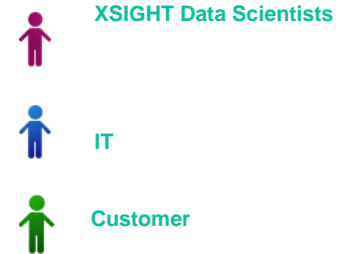
From Data Management to Asset Management

3. HOW - XSIGHT Division – Industry 4.0

New approach



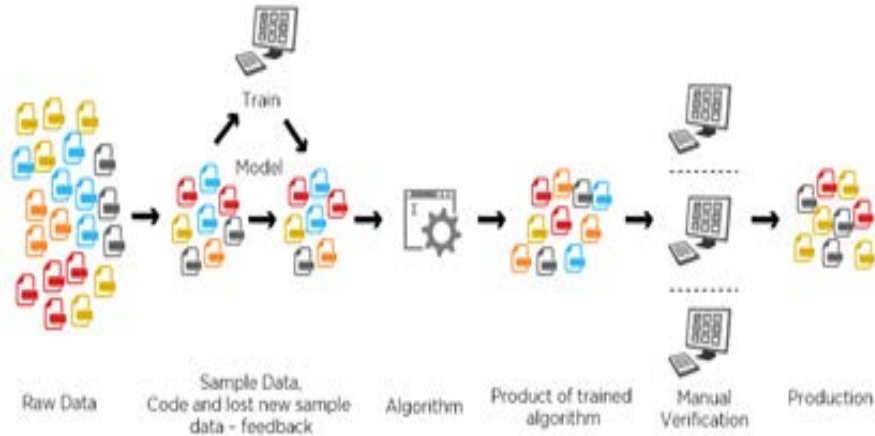
CRISP-DM methodology



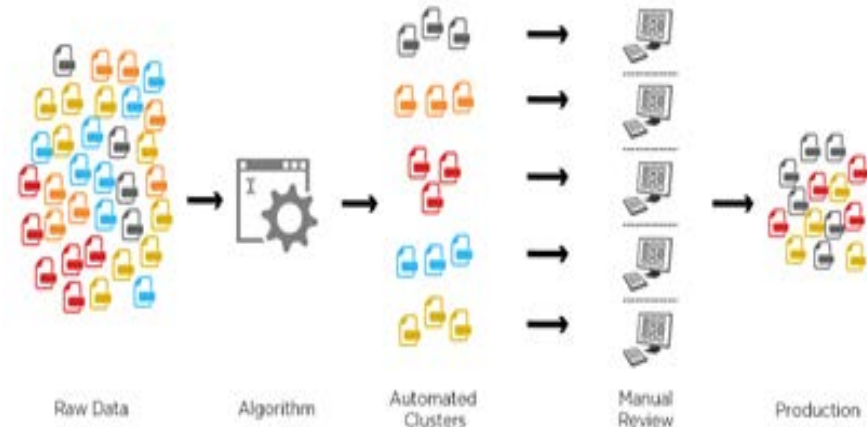
3. HOW - XSIGHT Division – Industry 4.0

Machine Learning Main Techniques

Supervised Learning

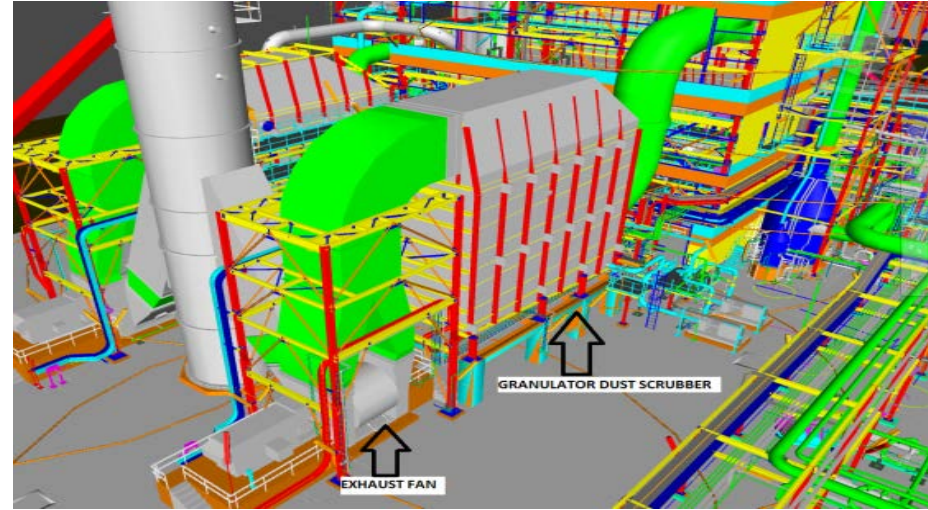


Unsupervised Learning



4. ACTIVITES ONGOING – PREDICTIVE MAINTENANCE

Case Study no 1: A mechanical equipment



The Problem

Object: Fan used to extract hot air to dry urea powder

Problem: Abnormal Vibration of the Scrubber Extraction Fan

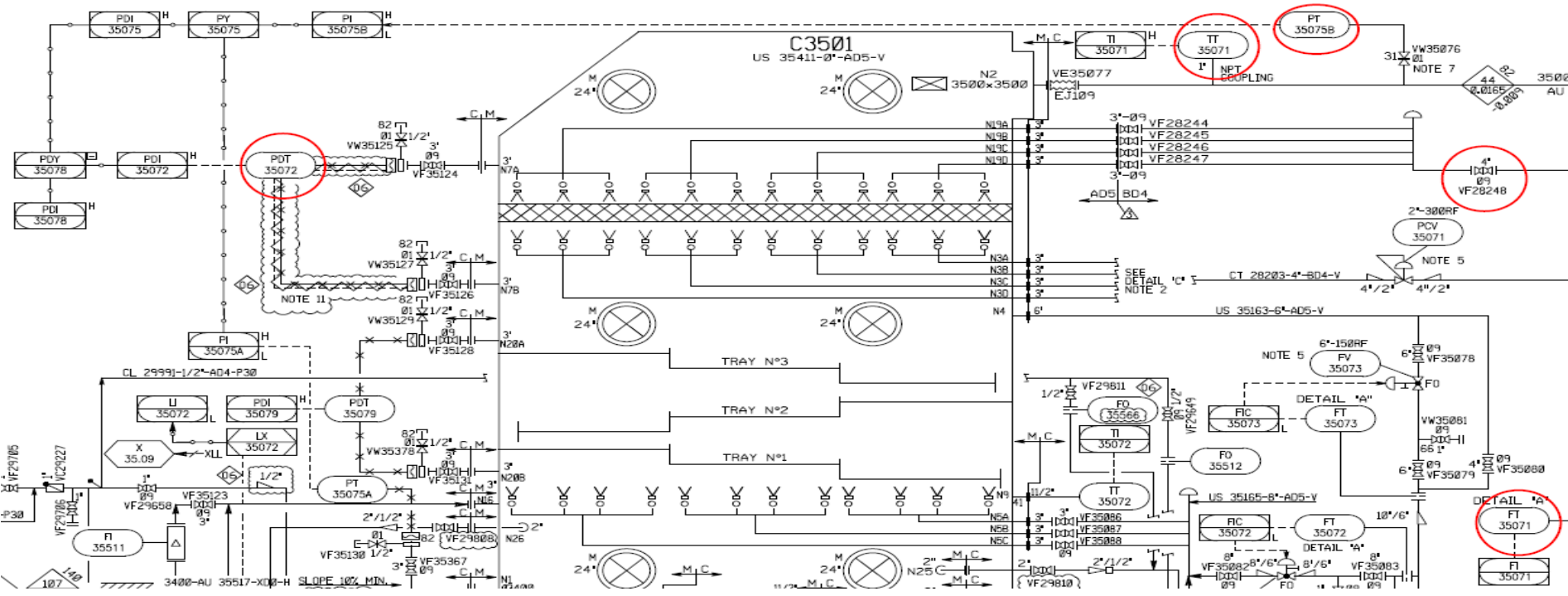


Innovative Approach for Problem Solving:

- ✓ Use of **Predictive Maintenance Techniques** supported by **Machine Learning Techniques** (Clustering, Decision Tree, and Neural networks)

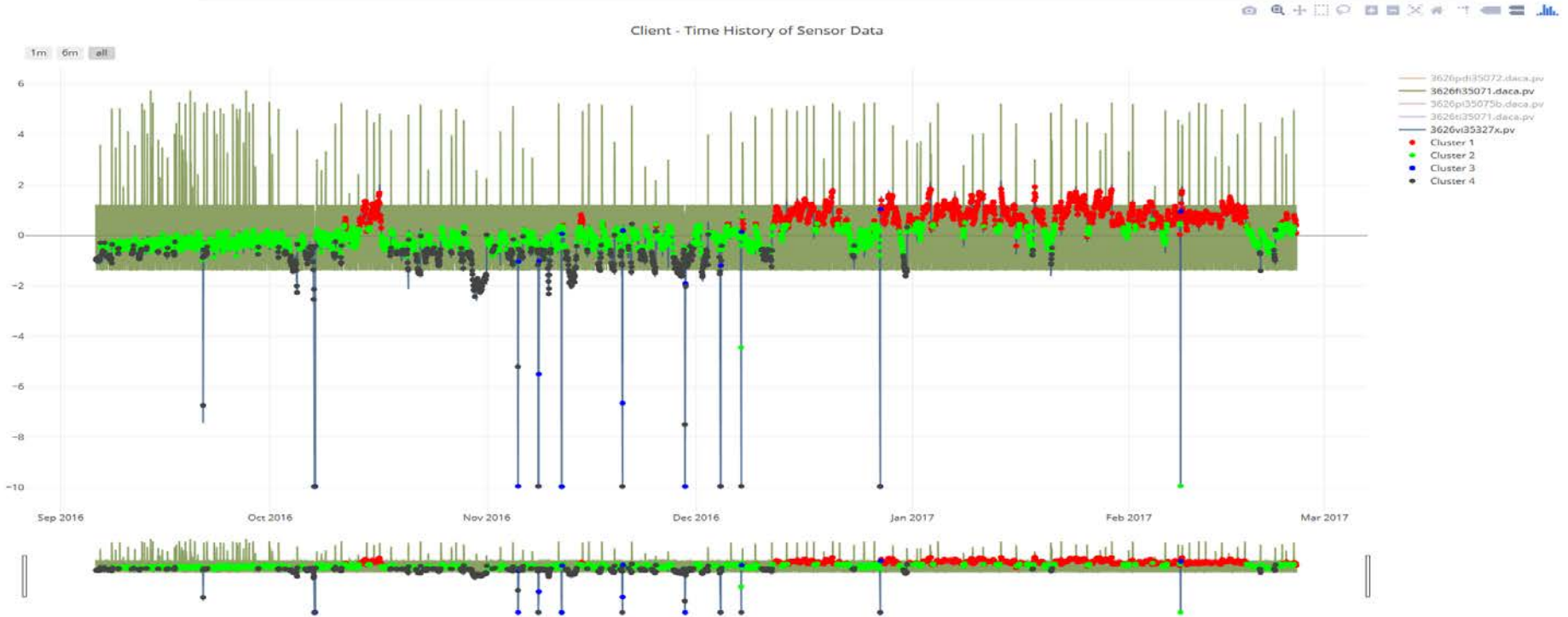
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Case Study no 1: A mechanical equipment



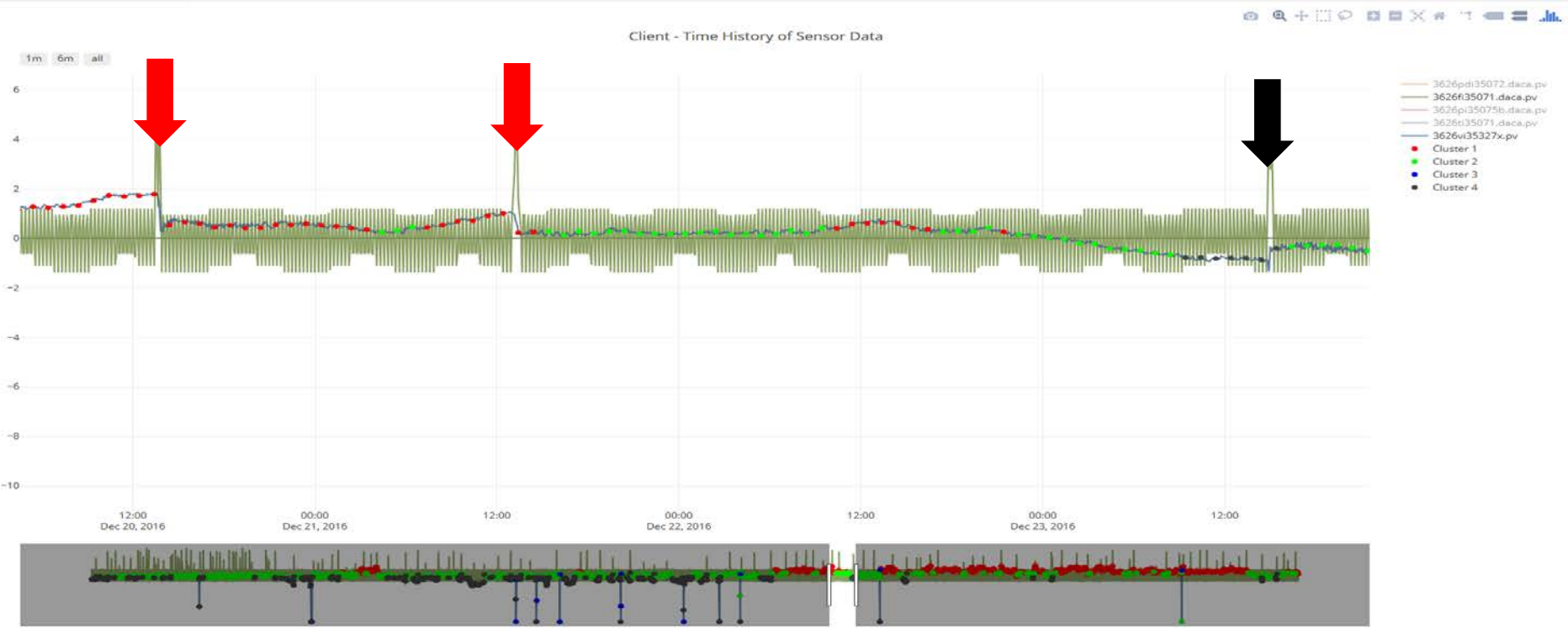
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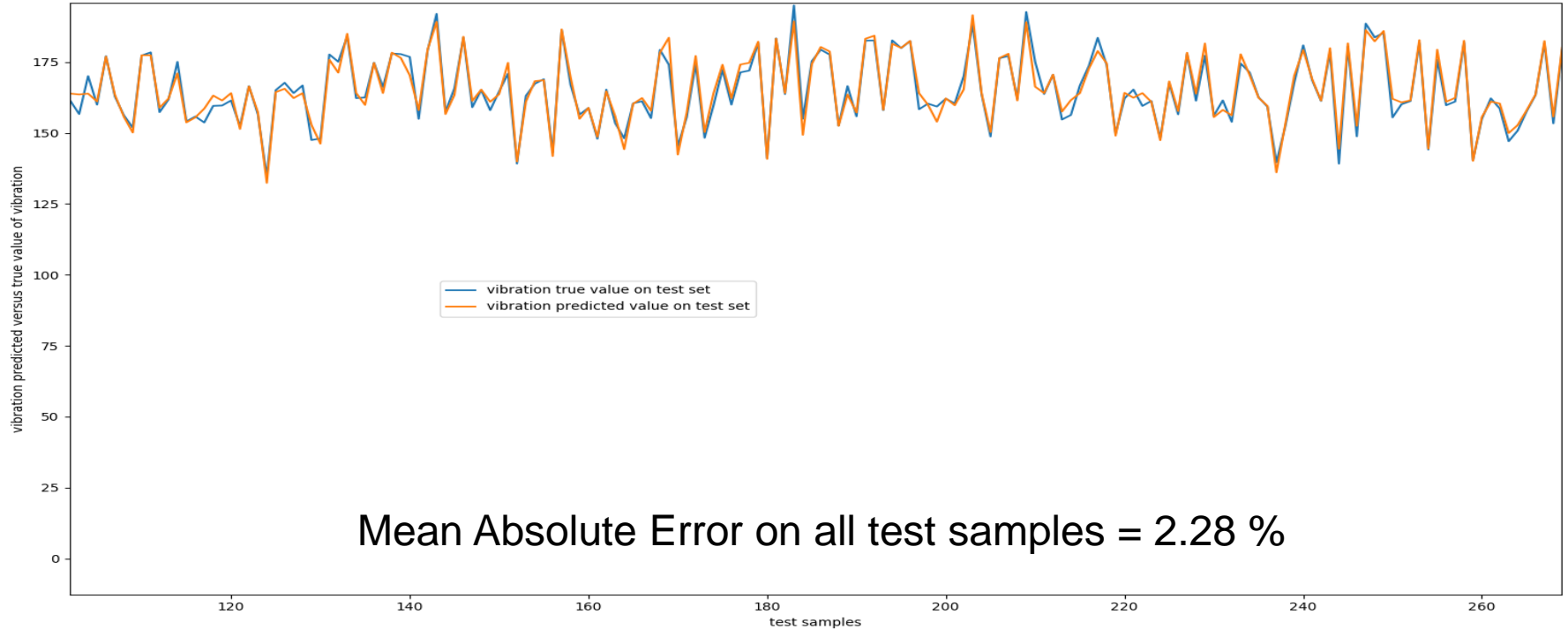
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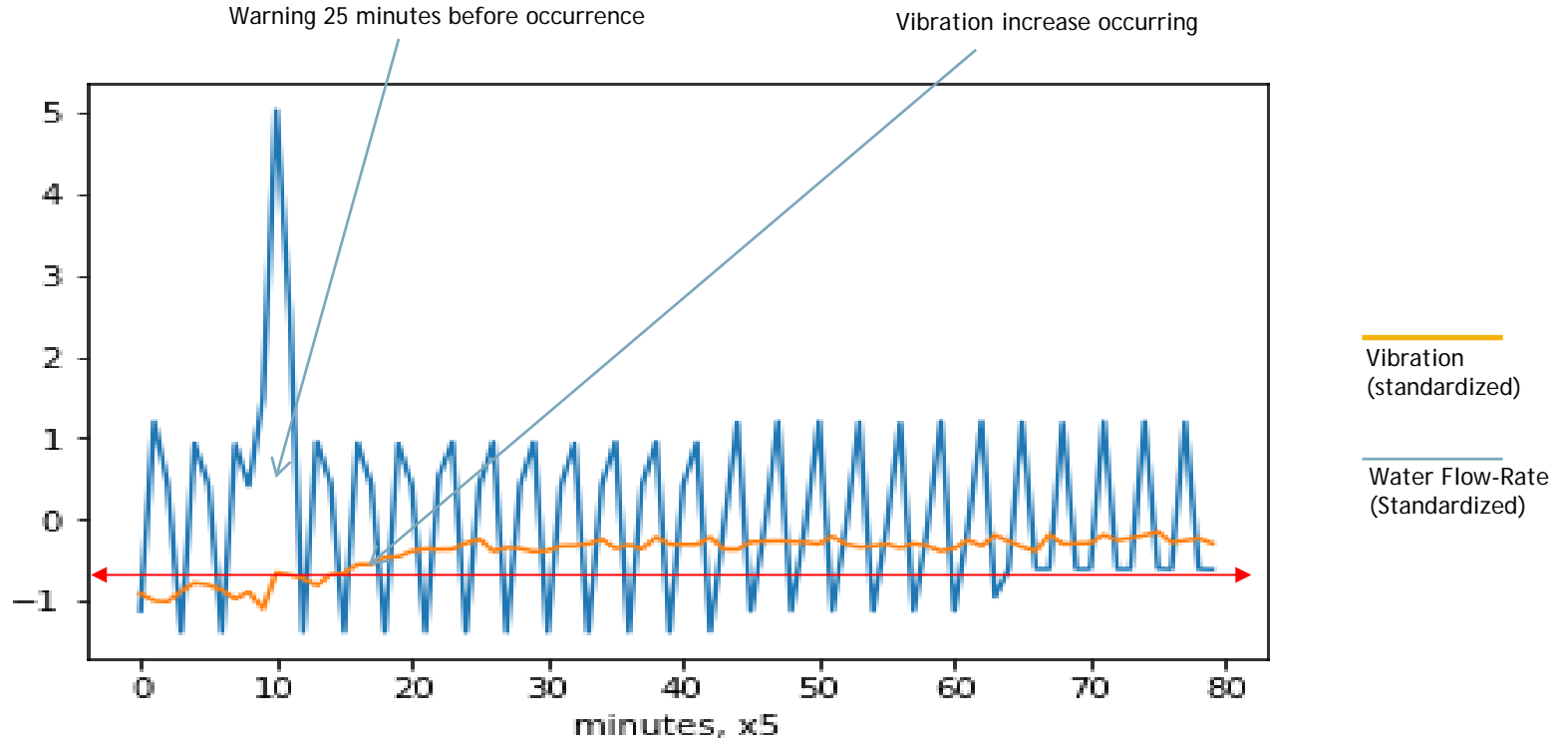
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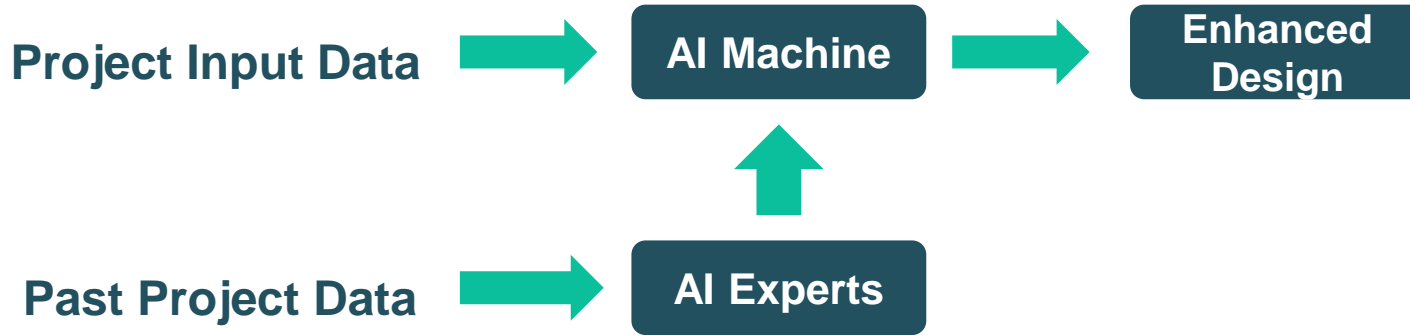
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4. COGNITIVE ENGINEERING

AI Protection Layer: Algorithms are used as a further layer of design verification to improve quality/effectiveness rather than a replacement of human labor force



AI can be used for intelligent automation of tasks when:

- 1) the tasks have been performed several times in the past (> 1000 times)
- 2) the tasks are frequent during project execution
- 3) relevant information/data is present in the Company archives

CONCLUSION

SAIPEM as a GLOBAL ENERGY SOLUTION PROVIDER

Know how and skills

60 year of Experience



Analytics for *Operating Plant* to deploy new services

Analytics for *Design* to increase Efficiency

New opportunity and solutions

Digital Innovation

A large teal graphic on the left side of the slide, consisting of two triangles pointing towards each other to form a larger, irregular shape that tapers to a point on the right, where it meets the word 'Thanks'.

Thanks

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Castello di Belgioioso 4 Luglio 2018