How Dredging Benefits from Self-Service Advanced Analytics

Presented by: Kristof De Mey, Manu De Block

DEME
Dredging, Environmental & Marine Engineering

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Agenda

DEME Group

Innovation Hackathon

DEME's PI System Story

TrendMiner Case

Conclusion

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DEME: Dredging, Environmental & Marine Engineering

- Market Leader
- Global Solution Provider

- + 5000 people
- + 100 vessels
- + 90 Countries
- + 140 years xp
- € 2.4 Billion/y

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Offering solutions for global challenges

What about
the rising sea level?

What about the scarcity
of mineral resources?

What about the ever
growing population
in coastal areas?

What about
soil & water pollution?

What about growing
CO2 emissions?

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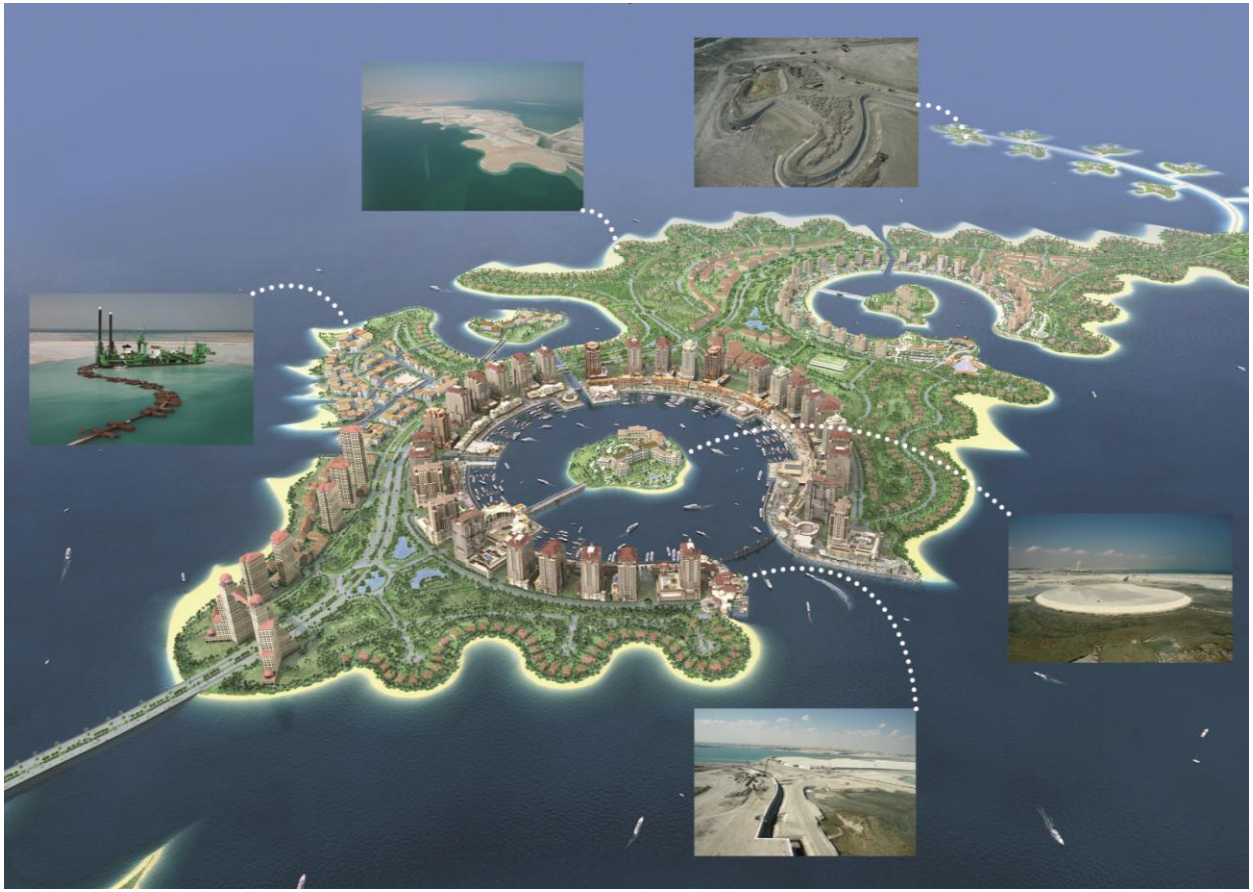
Dredging, land reclamation, port construction, maintenance dredging



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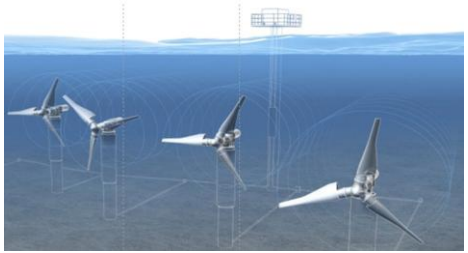
Development and construction of renewable energy projects



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Decontamination of polluted soils and silts

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Harvesting marine resources, deep sea mining

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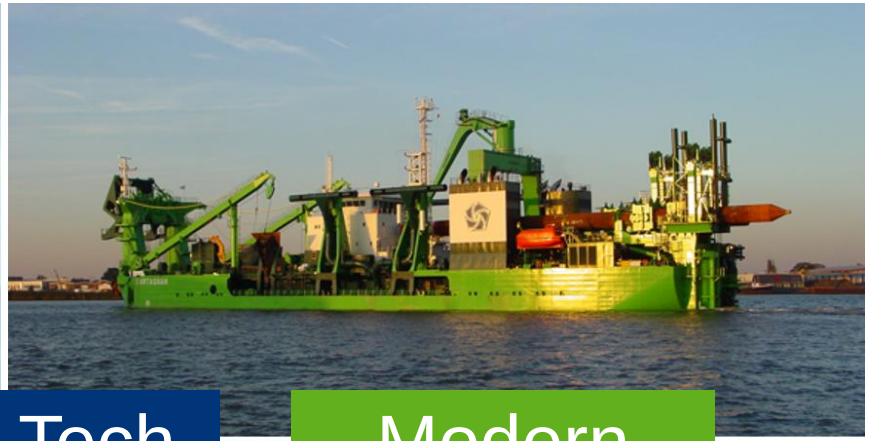

Versatile

High-Tech

Modern

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Global Marine Construction – A Challenge

- What's underground
- Decentral operations
- High hour cost - act!
- Floating factories

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Hackathon Information and Winners

- DEME was data sponsor for the Innovation Hackathon
- 3 Cases:
  - Sensor data quality handling
  - Soil model visualisation
  - Windfarm installation planning
- Congratulations to all participants
  - And the winners are …

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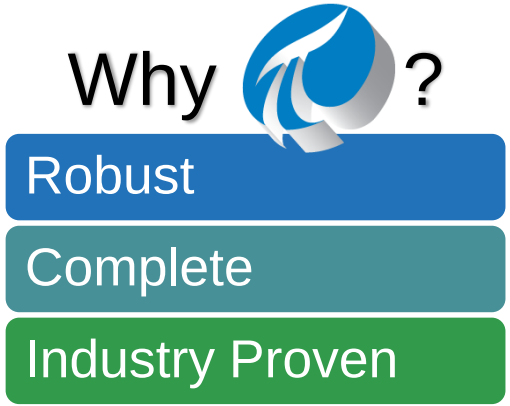
The PI System (hi)story @ DEME (1)

- Start = 2010
  - Historian with stack of tools
    Yes, you can have it all
  - A project, not a department
    No steep learning curves
- ‘Remote viewing’ project

Decentral operations

Floating factories



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The PI System (hi)story @ DEME (2)

- Growing realisation: **data = value**
  - Big Data
  - Feedback
  - OEE - Overall Equipment Effectiveness
  - CBM - Condition Based Maintenance

- 2016: enter TrendMiner JOINT INNOVATION

What's underground

High hour cost - act!

Floating factories

+

Decentral operations

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Floating factories

Technical stuff for geeks

- 24 large production vessels, worldwide via satellite
- 14000 points every 1 or 2 seconds
- '*Datapump*' pushing data to an UFL server
- Close to 100 UFL interfaces
- Microsoft Azure Cloud
- 7 servers (Incl. TrendMiner)

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What's underground

Some unexpected behaviour

- The hopper dredger
- Pumping a mixture
- Dynamic process

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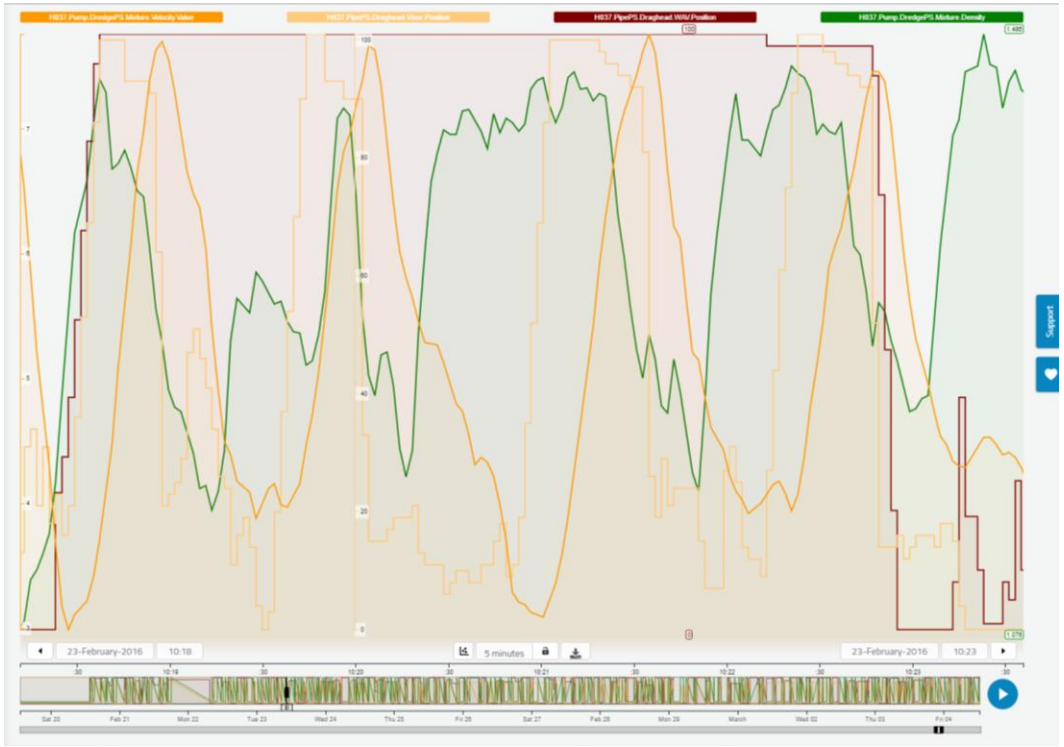
What's underground

Some unexpected behaviour

- The hopper dredger
- Pumping a mixture
- Dynamic process
- Oscillations



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What's underground

Questions and hypotheses

- To what extent?
- Why does it begin?
- When does it stop?
- Soil type influence?
- Is it a problem?

Why TrendMiner? JOINT INNOVATION

Google of the industry: powerful search

Easy access, promote data usage

Self-Service Analytics philosophy

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What's underground

Questions and hypotheses

- To what extent?
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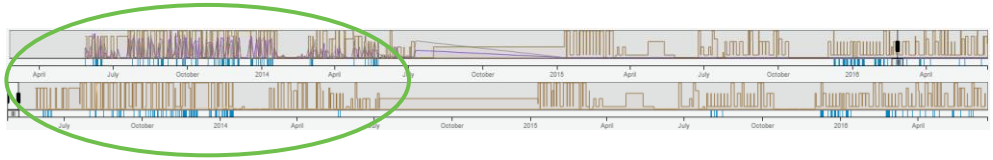
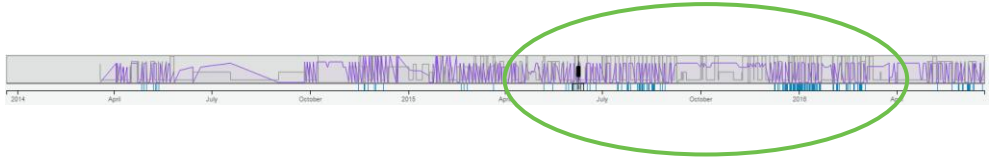
Happened in the past



Happened on other ships



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What's underground

Questions and hypotheses

- To what extent?
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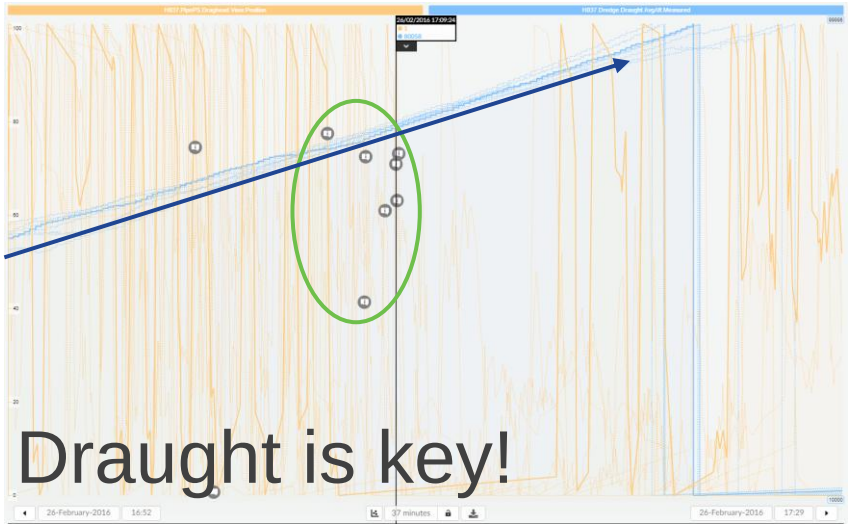
After 20 minutes?



Draught is key!

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What's underground

Questions and hypotheses

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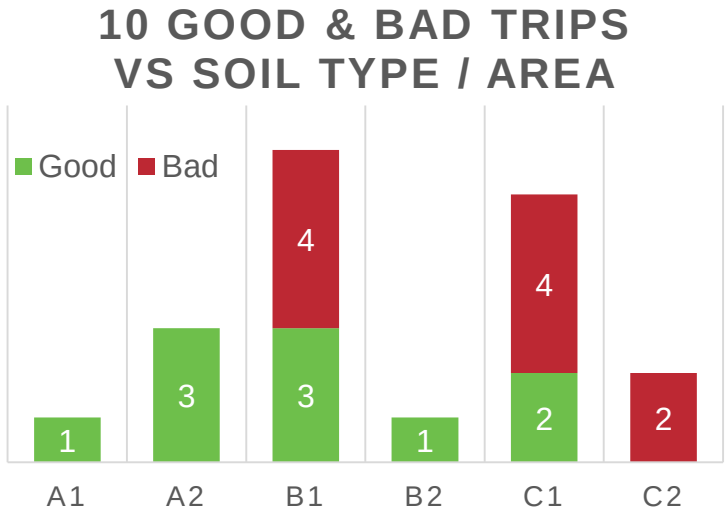
Oscillations mainly occur in certain zones



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What's underground

Questions and hypotheses

- To what extent?
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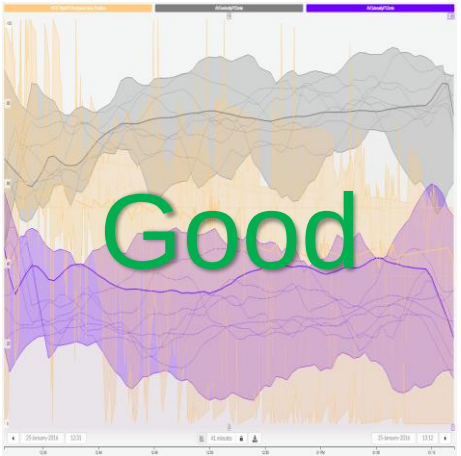
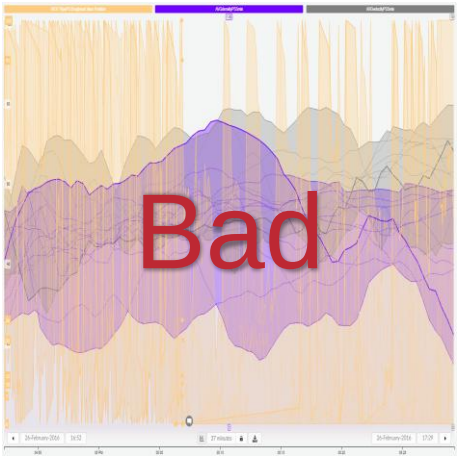
- Is it a problem?

Yes! But deceptive due to zones and soil types.





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What's underground

Questions and hypotheses

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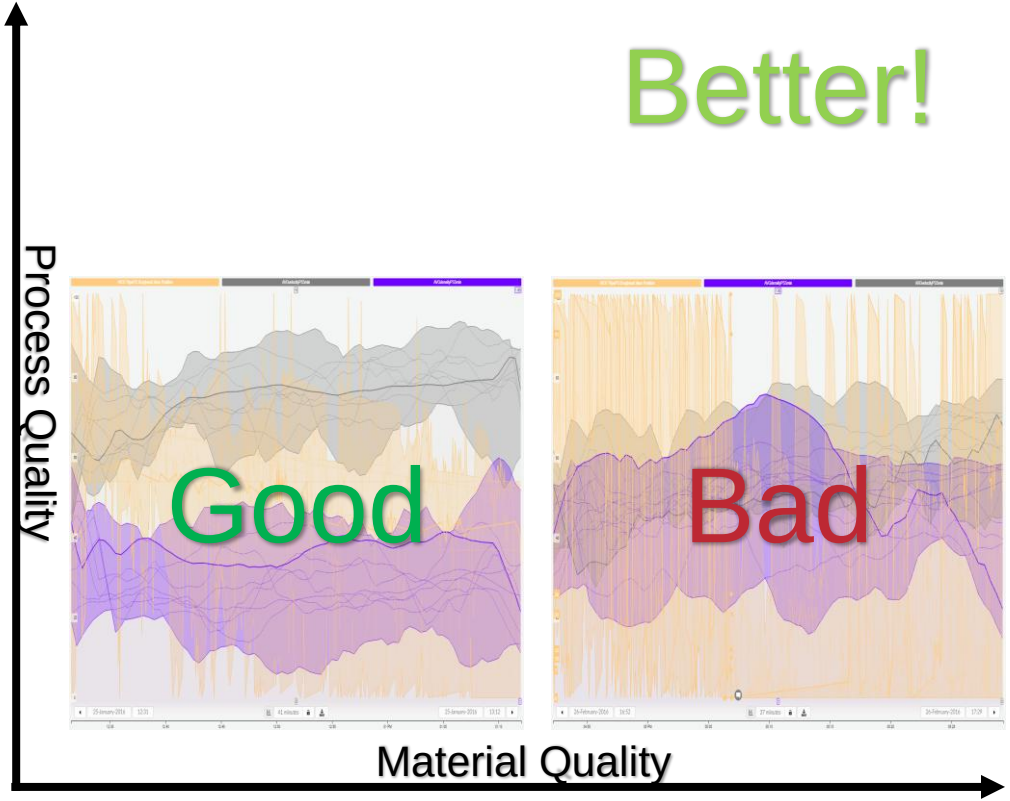
Better!



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What's underground

Questions and hypotheses

- To what extent?
- Why does it begin?
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What works in soil type A does not automatically work in soil type B

→ **Lessons** and **insights**

Short-term

Long-term

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What's underground

Conclusion

Valuable lessons and Insights from Data

Short term:
use other setpoints

Long term:
further study provided extra knowledge to better dredge in these soils

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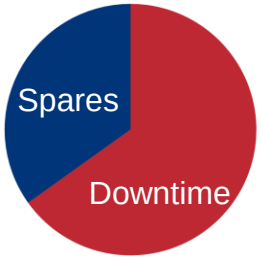
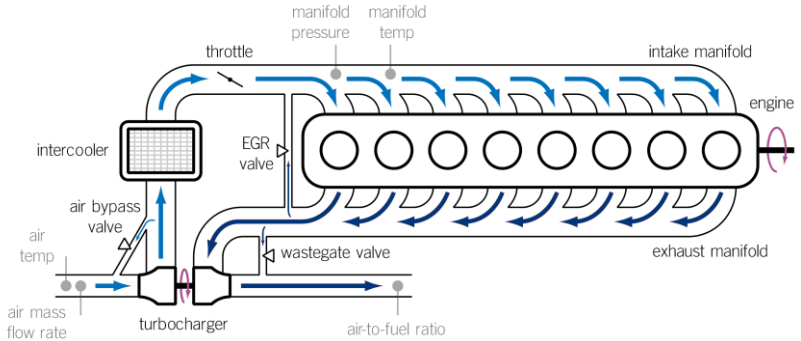
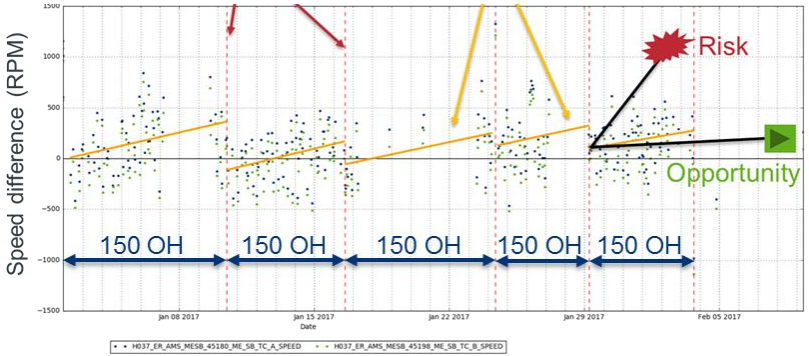
High hour cost - act!

Condition Based Maintenance

- Rolling out engine logging
- One asset as CBM pilot
- From Planned Maintenance to Predictive Maintenance
- €400k/year potential savings







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Floating factories

The Next piece of PI System

Future considerations from lessons

- Don’t try to make the Integrator for BA
- Pumps & Engines Performance Monitoring
- Deploying a test system
- Company wide data governance project
- ‘Smart Technology Platform’
- Improved logging with OPC

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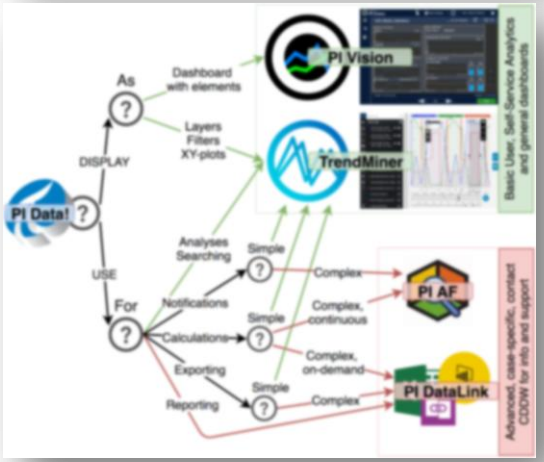
Creating a data culture



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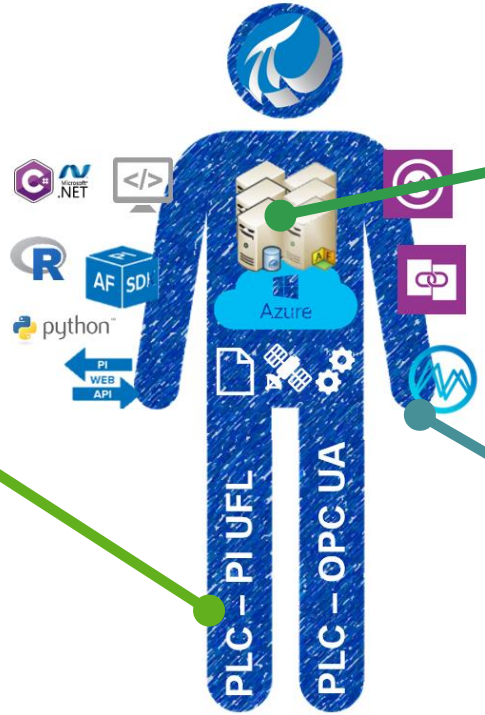
The PI System Guy Concludes



Healthy vital organs

Strong legs to stand on

Arms to interact

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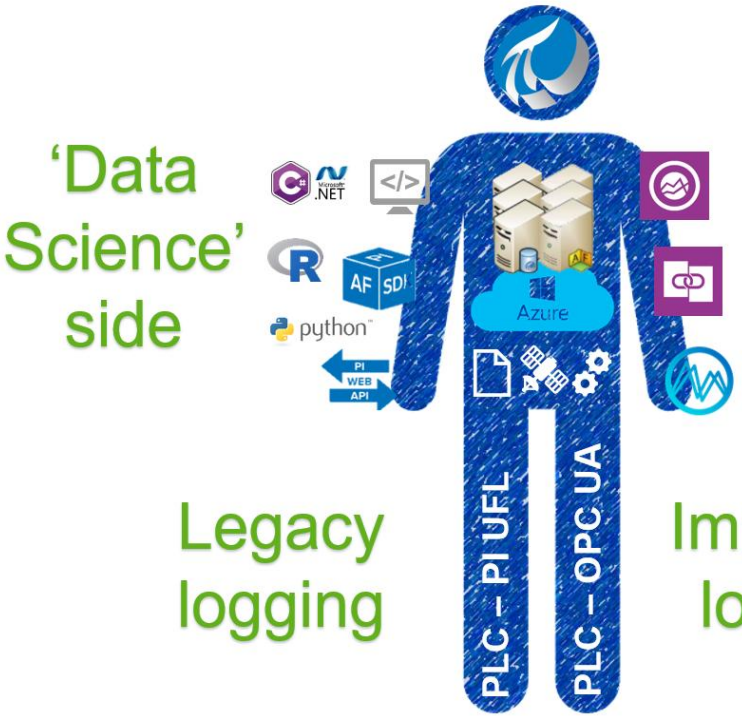
The PI System Guy Concludes



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How Dredging Benefits from Self-Service Advanced Analytics

CHALLENGE

Dredging has a high financial risk to it, as it is hard to limit uncertainty in production factors.

- Need to act quick with high hourly cost
- Floating factories challenge datalogging
- Decentral operations challenge knowledge sharing

SOLUTION

Robust datalogging with a combination of Self-Service Analytics and central efforts.

- Central PI System in the cloud
- TrendMiner and PI Vision accessible everywhere

RESULTS

Insights and knowledge build up for a better operation and lower uncertainty.

- Short term insights to act on
- Long term knowledge gain
- CBM rollout generating first savings, €400k potential for one asset type

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Presenters

- **Manu De Block**
- Data Engineer
- DEME
- De.Block.Manu@deme-group.com

- **Kristof De Mey**
- IT Business Partner
- DEME
- De.Mey.Kristof@deme-group.com

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