

MMPS

Manufacturing Maintenance Problem Solving



The Challenge

**“\$647 billion
are lost globally each
year due to machine
downtimes”**

International Society
of Automation



The Challenge



The Platform



Architecture
& Innovation



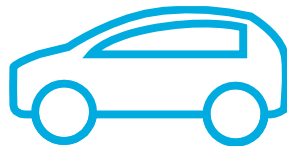
Scalability
& Flexibility



Data & Security



Quality & Risks



700,000,000,000

Kg flour

2,000,000

Ferrari

13,000,000,000

COVID vaccines

MMPS

Manufacturing Maintenance
Problem Solving

Make the most out of your machines



The Challenge



The Platform



Architecture
& Innovation



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& Flexibility



Data & Security



Quality & Risks



The Platform

CTR
14.65%
↑ 10.6%

Quality Score

9.38

↓ -0.1%

Cost per conversion

673.27

↓ -0.2%



Maintenance line worker

Preventive reaction to failures

Get alert from abnormal behavior

Make the most out of each machine



Maintenance manager

Generate knowledge from the signals

Better prioritize maintenance schedules

Avoid unexpected downtimes and reduce maintenance overheads



Maintenance line worker



1 The Challenge



2 The Platform



3 Architecture
& Innovation



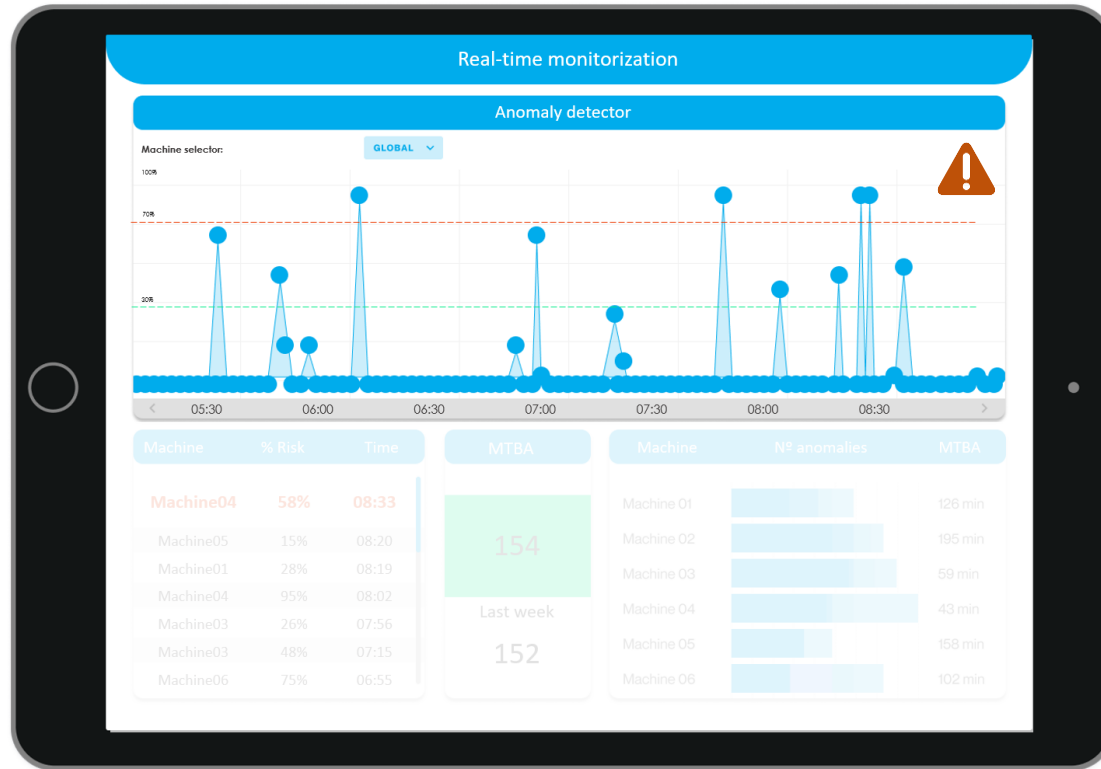
4 Scalability
& Flexibility

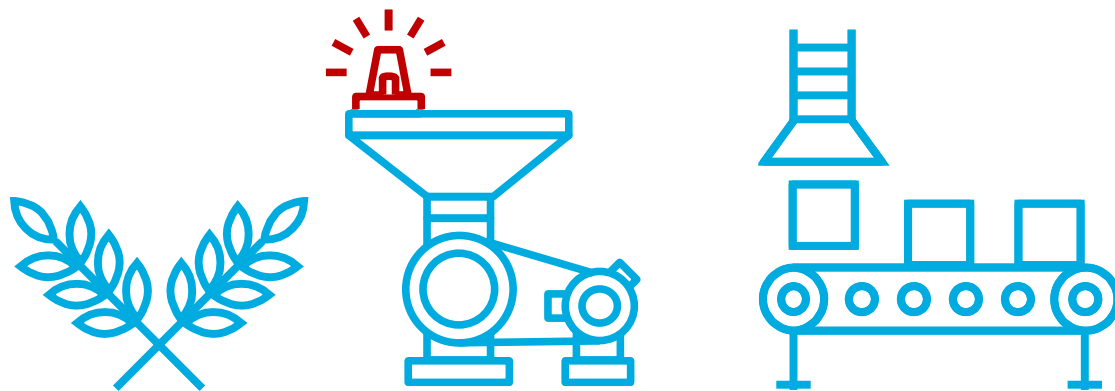


5 Data & Security



6 Quality & Risks









Maintenance manager



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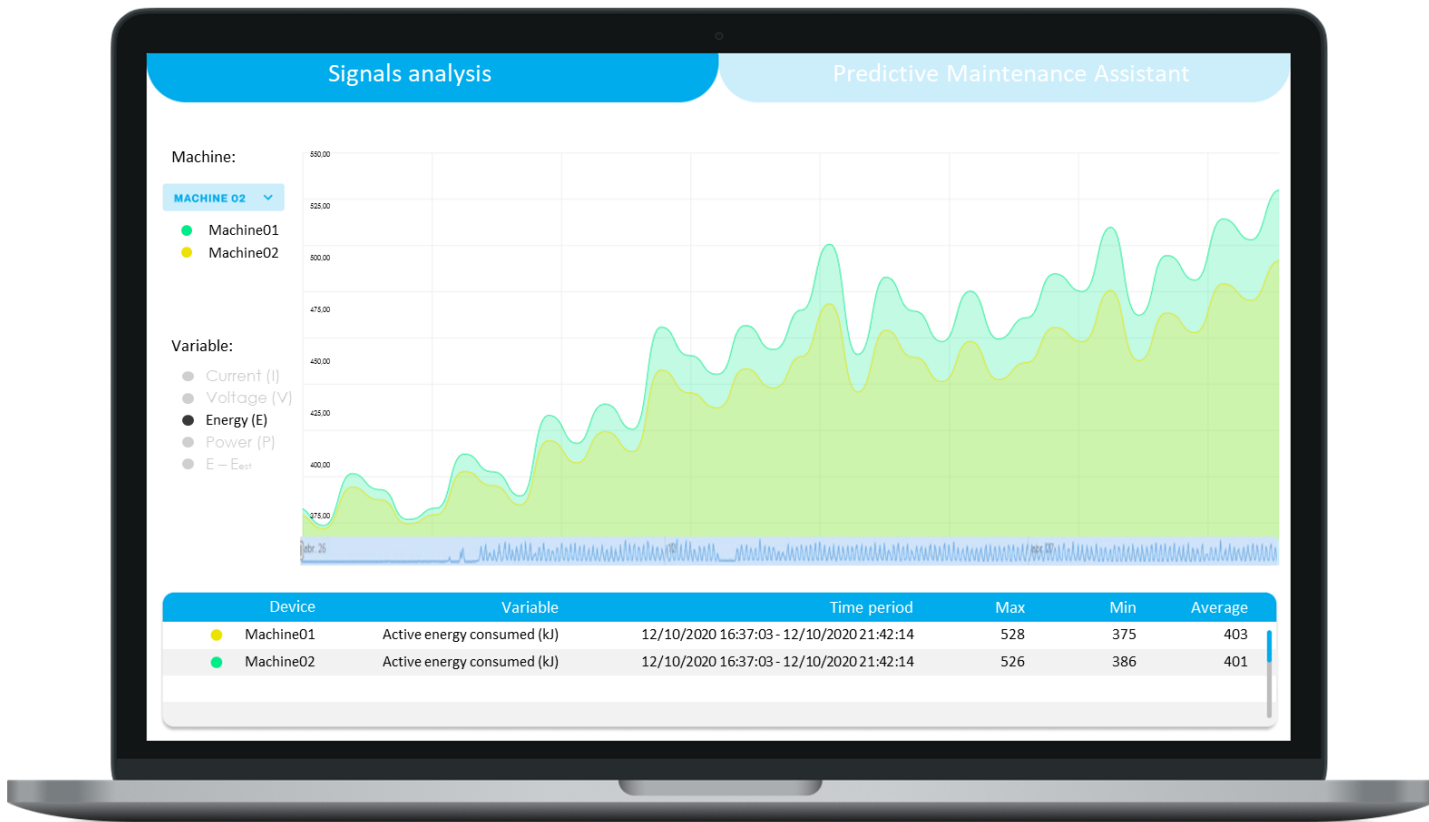
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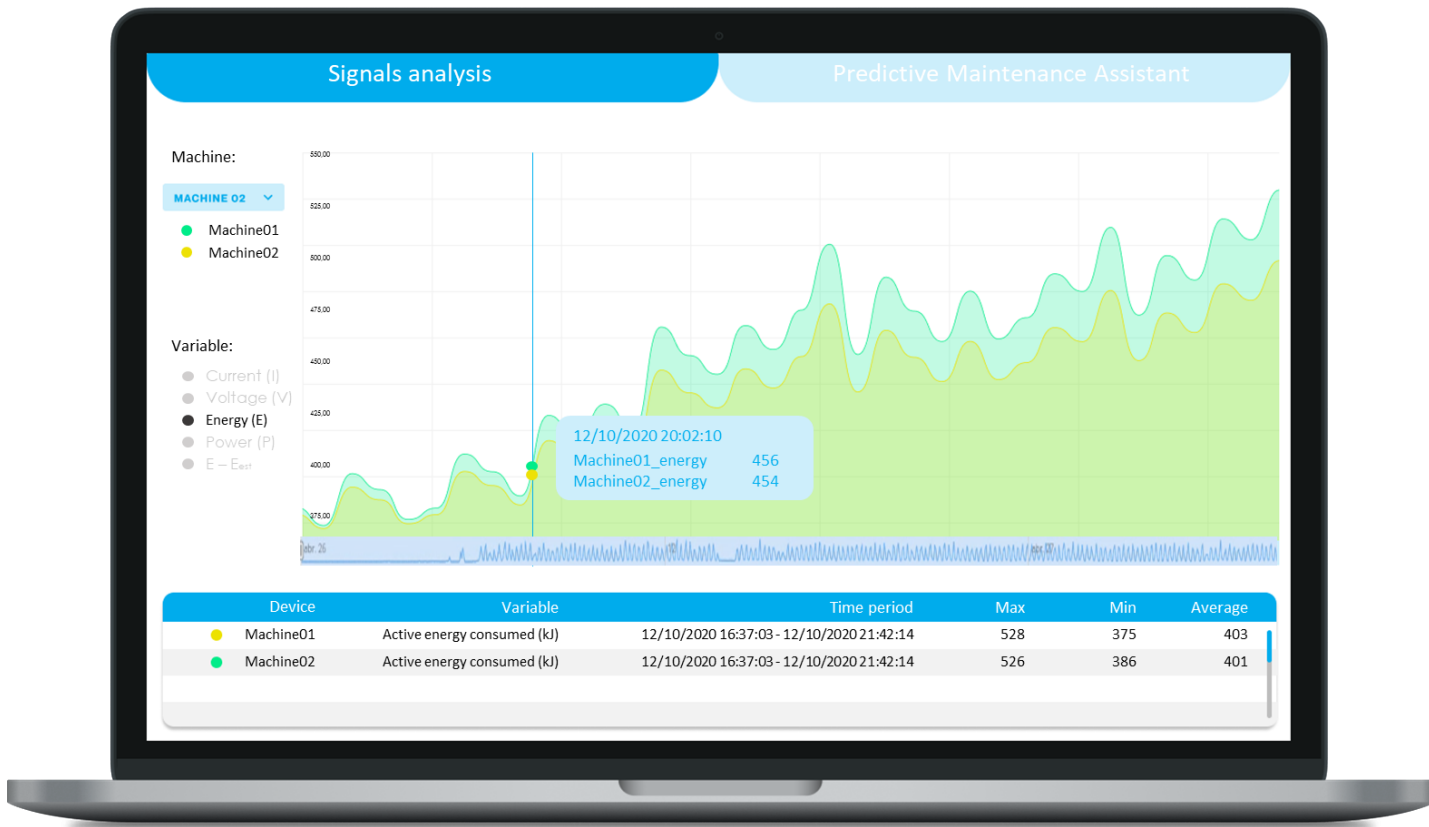


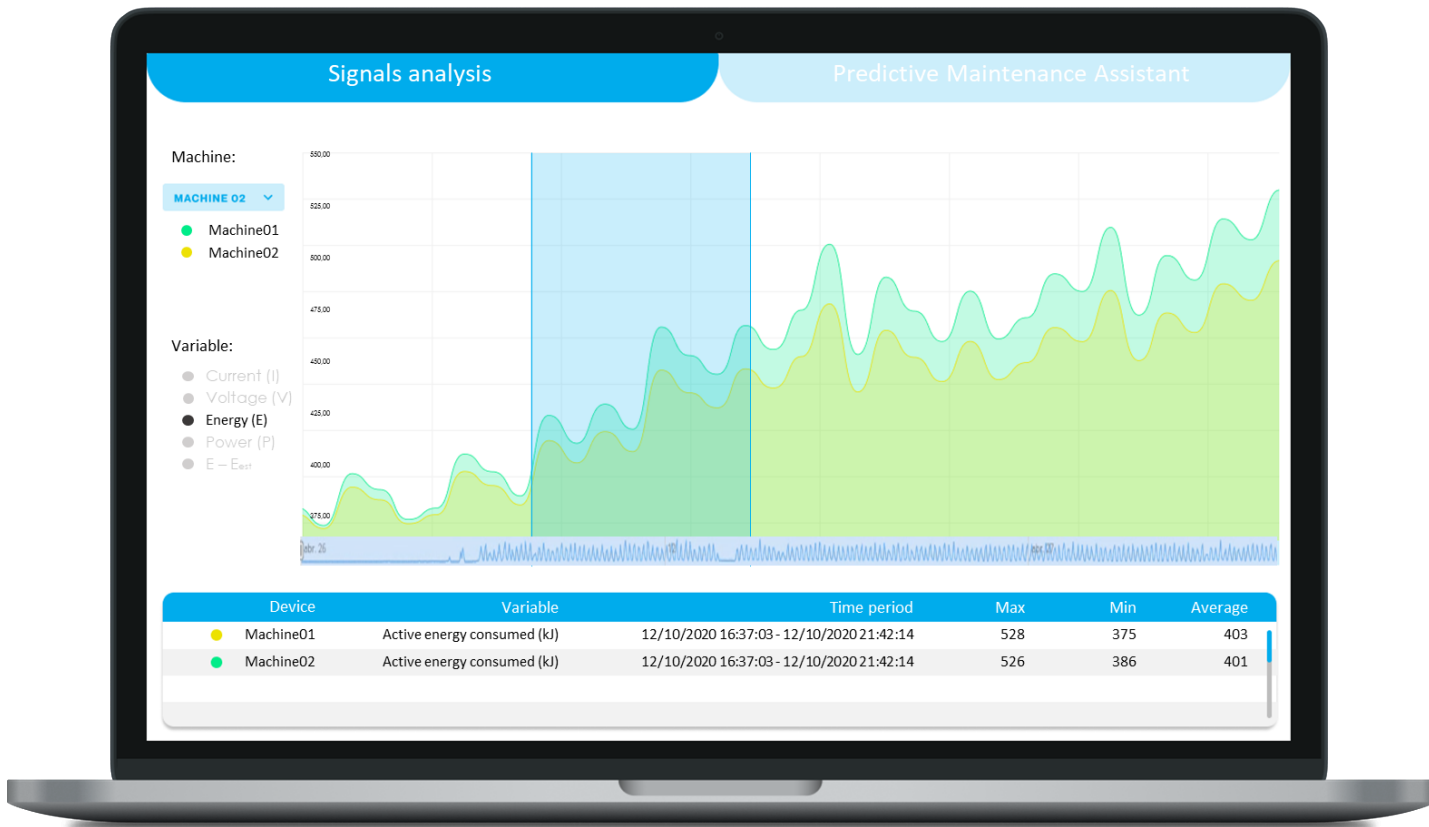
5 Data & Security

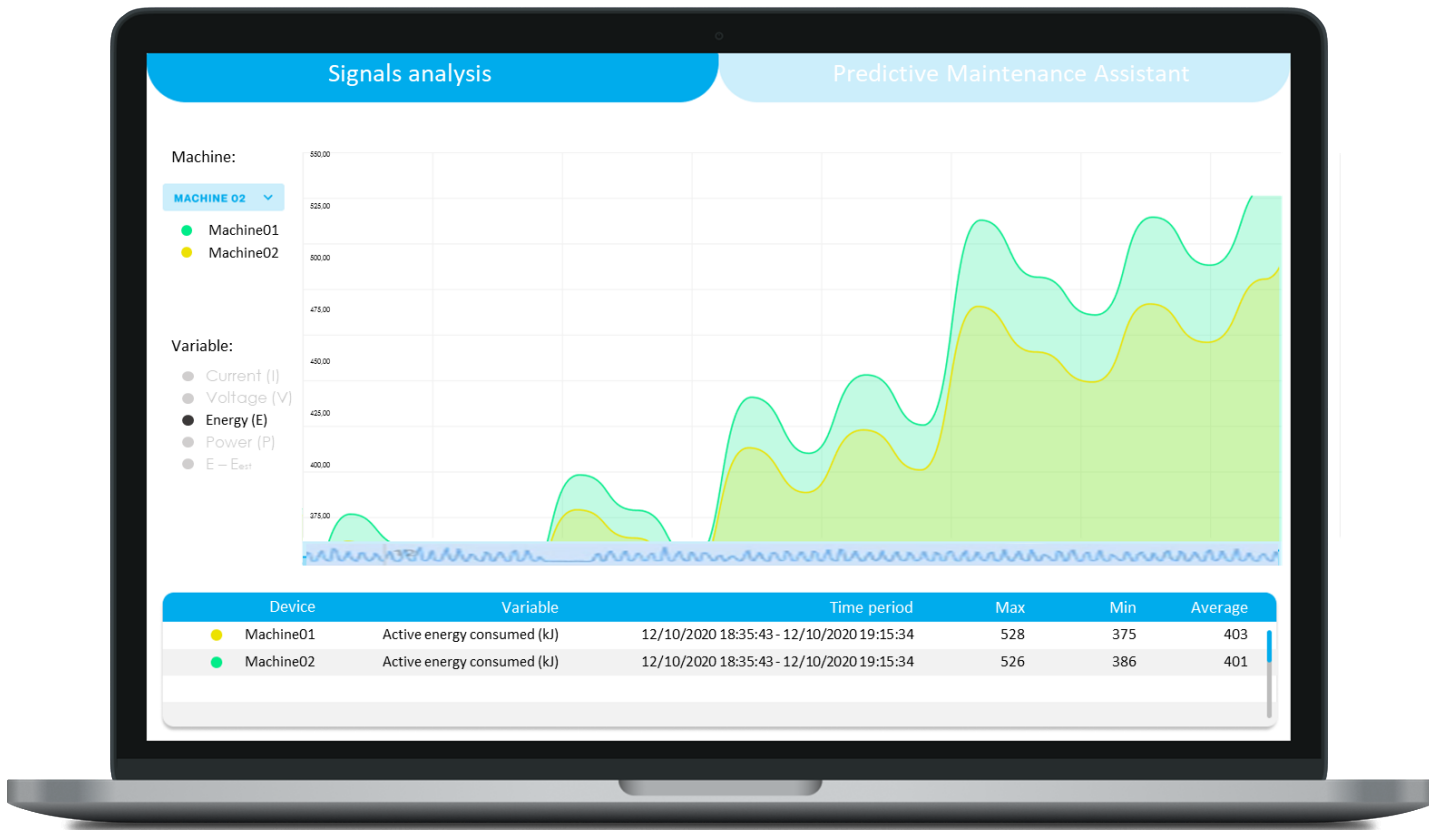


6 Quality & Risks

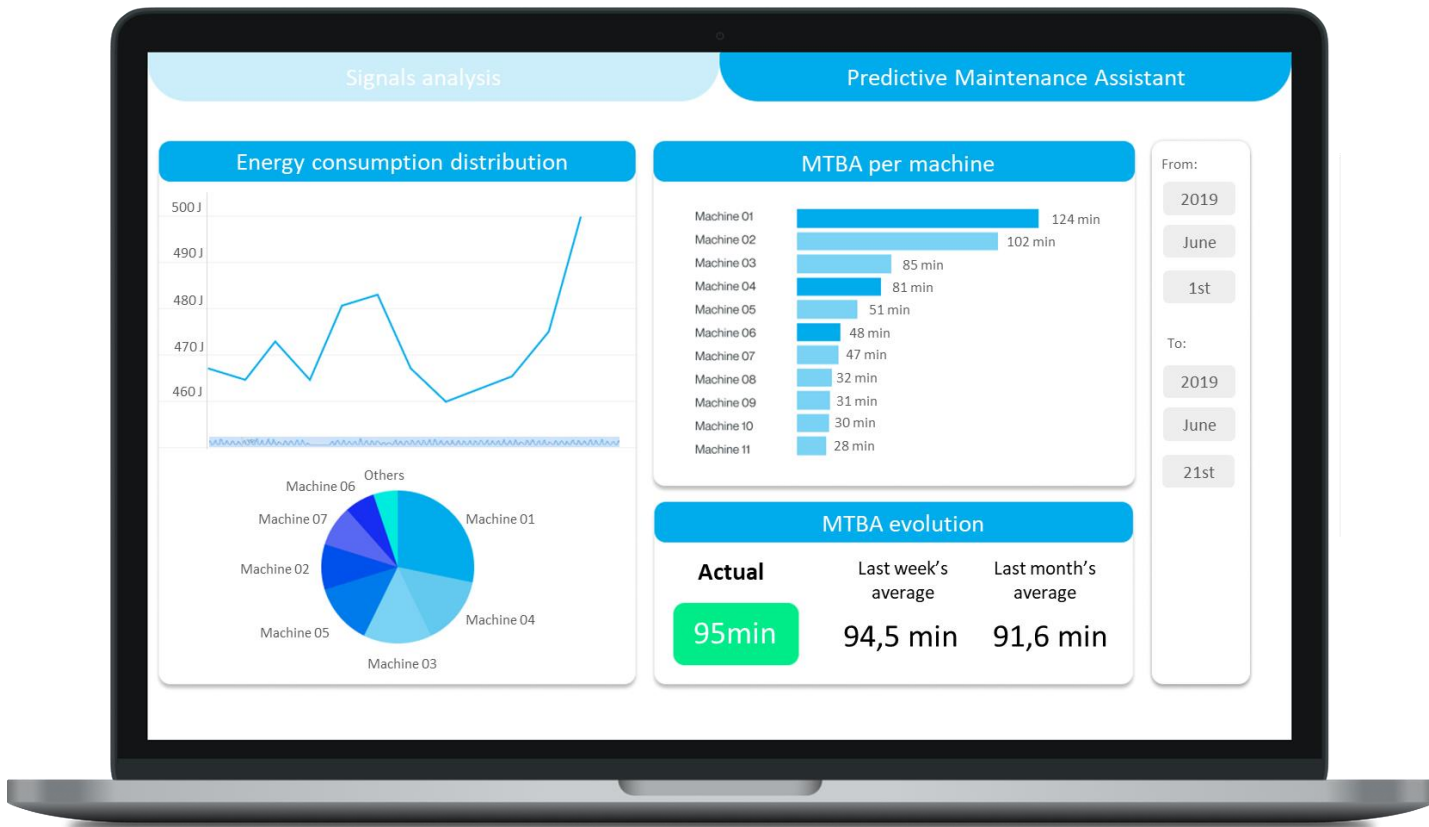


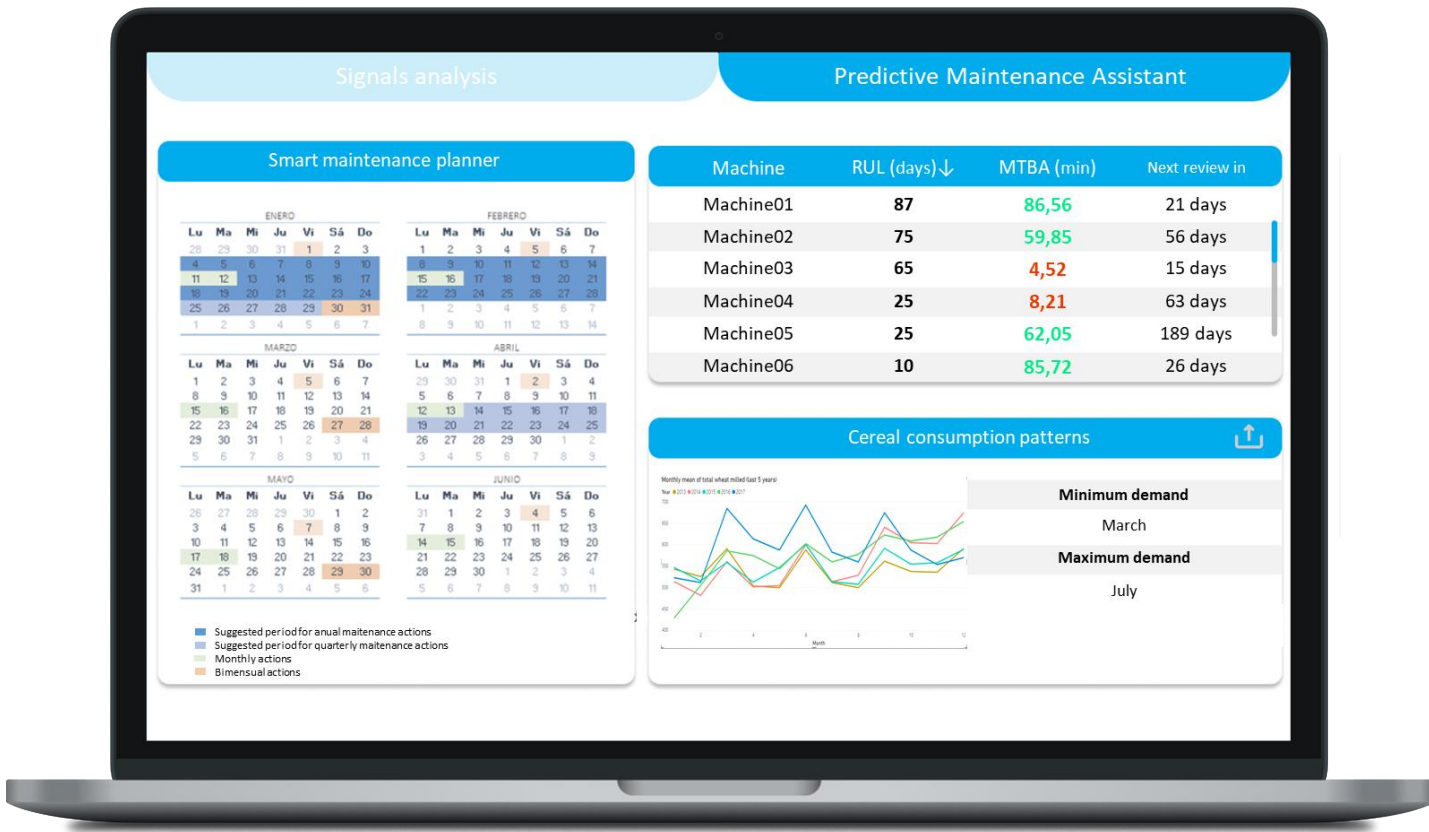


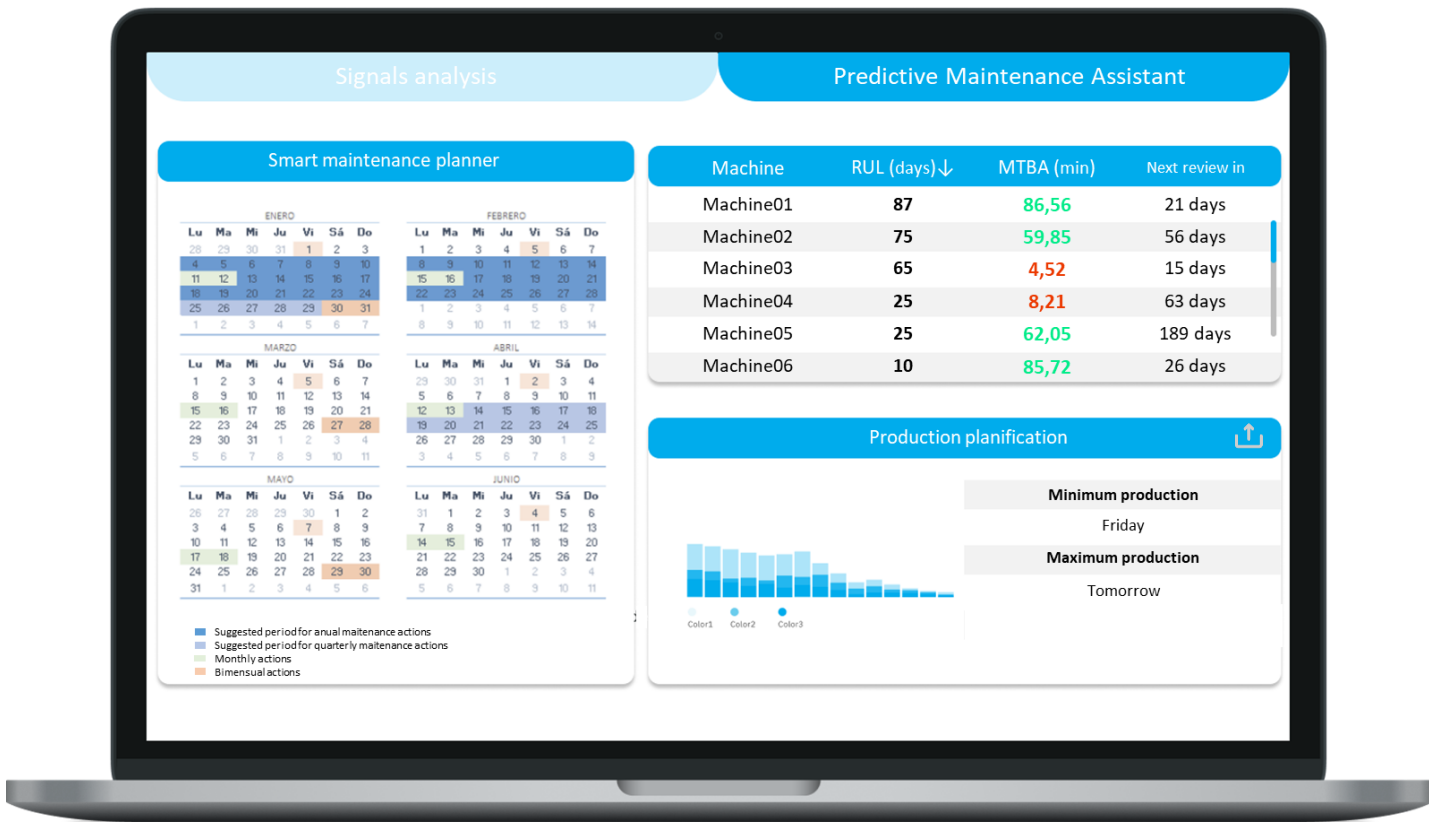






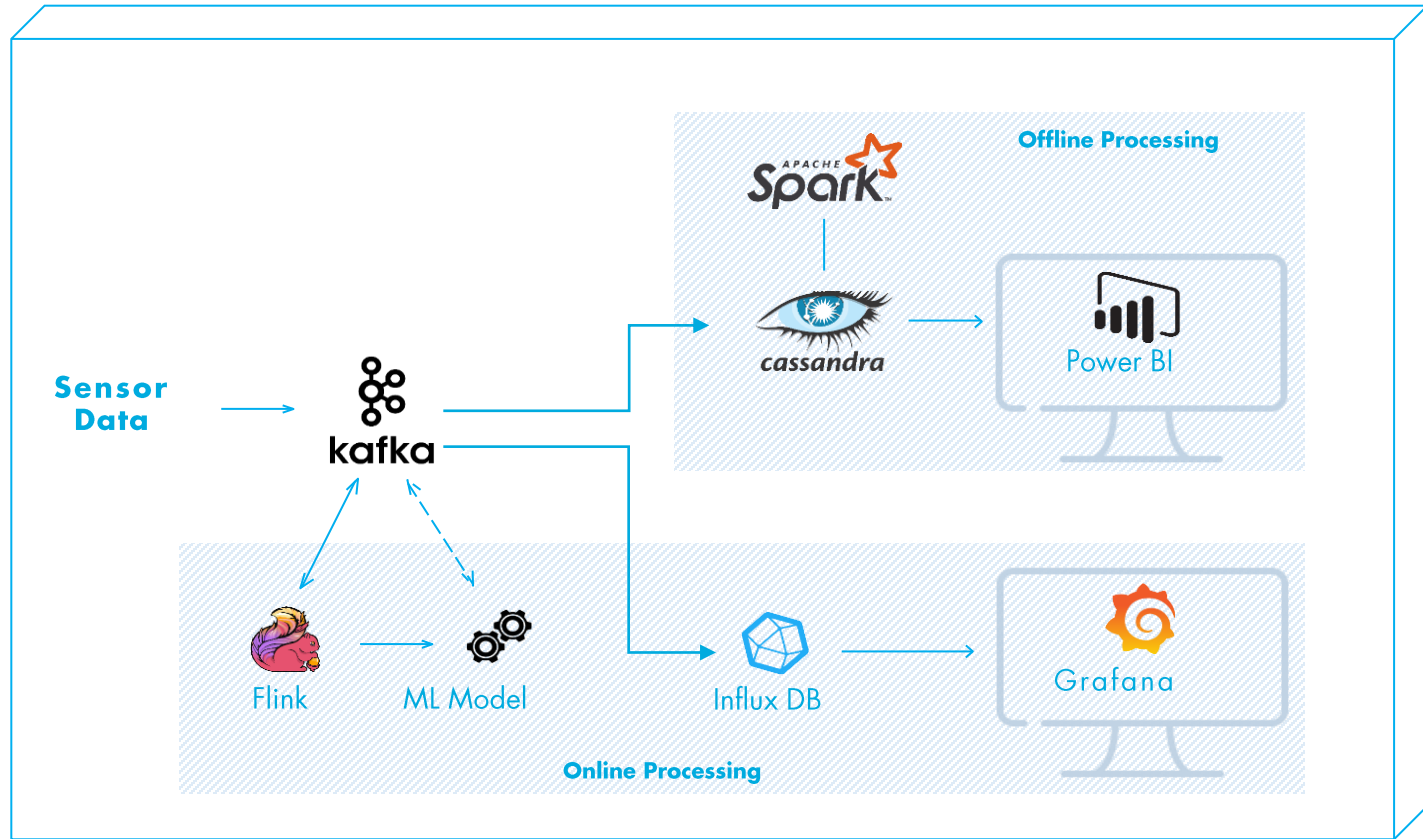


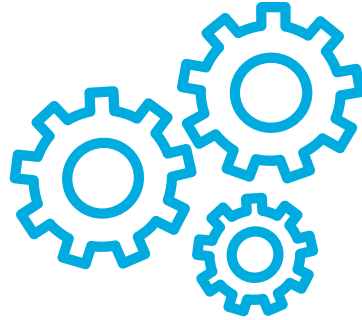






Technical Architecture & Innovation





ML Models



The Challenge



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INNOVATION

Anomaly Detection Model

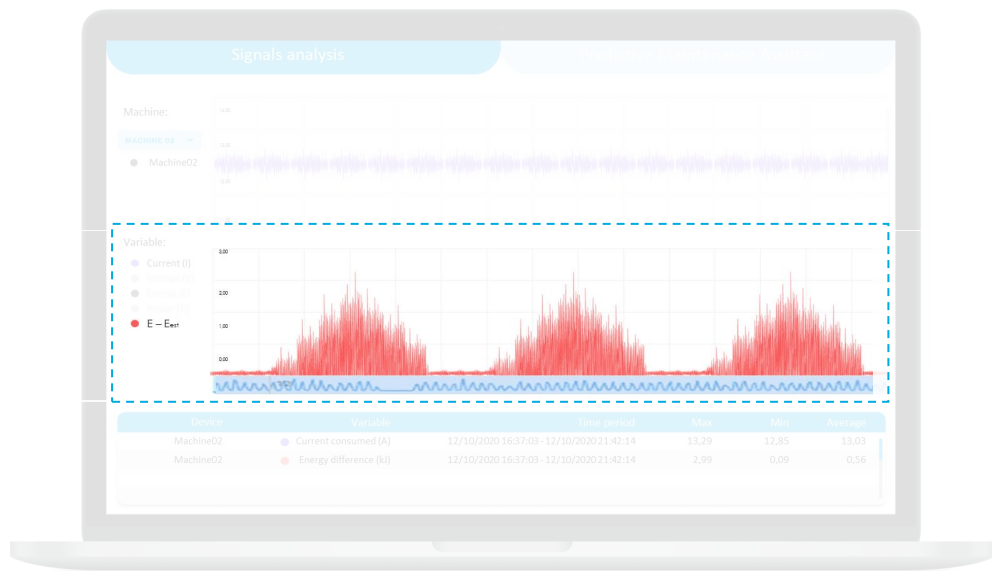
Unsupervised multivariate OD algorithms

Isolation forest
PCA
LOF





INNOVATION



Machine Degradation's Pattern Recognition

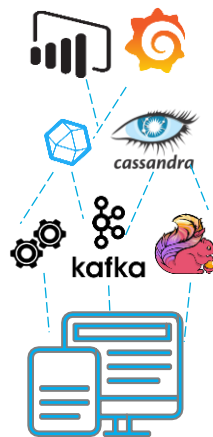
LSTM-AE algorithm (Deep learning)

High reliability on time series data

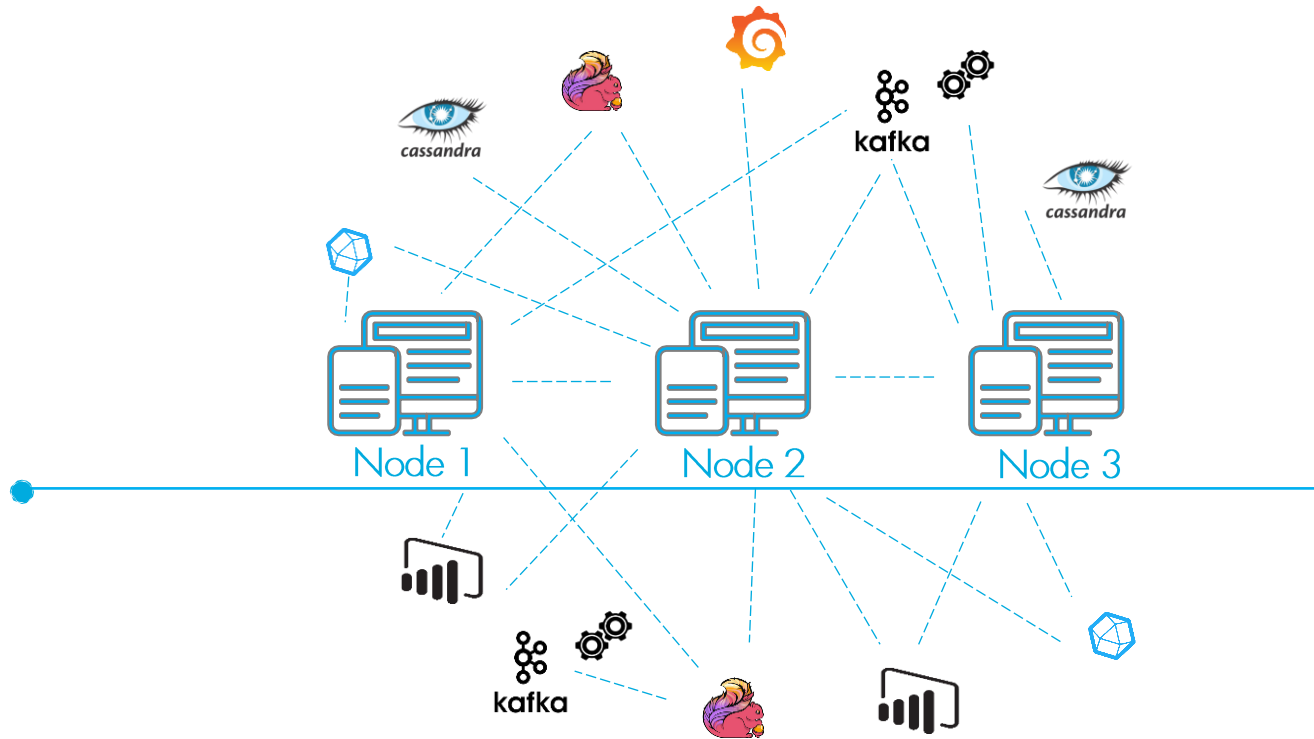


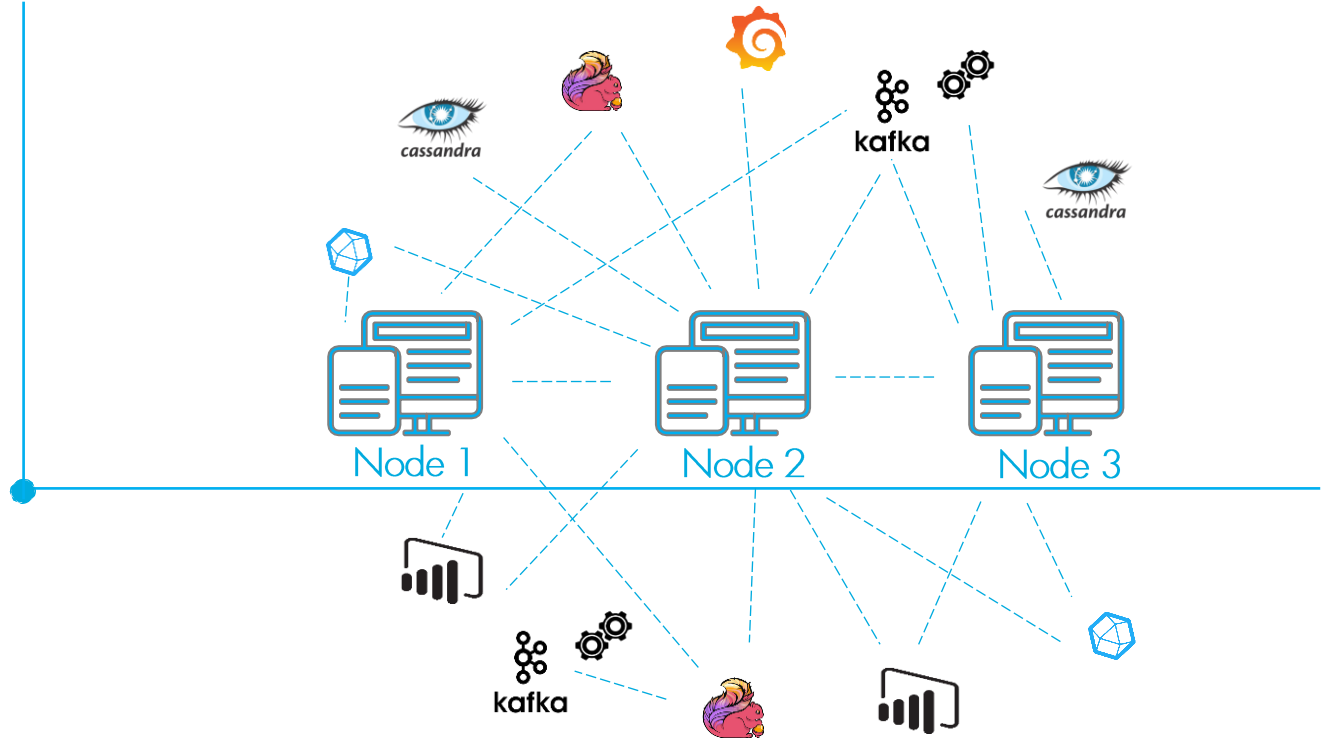
Technical Scalability & Flexibility

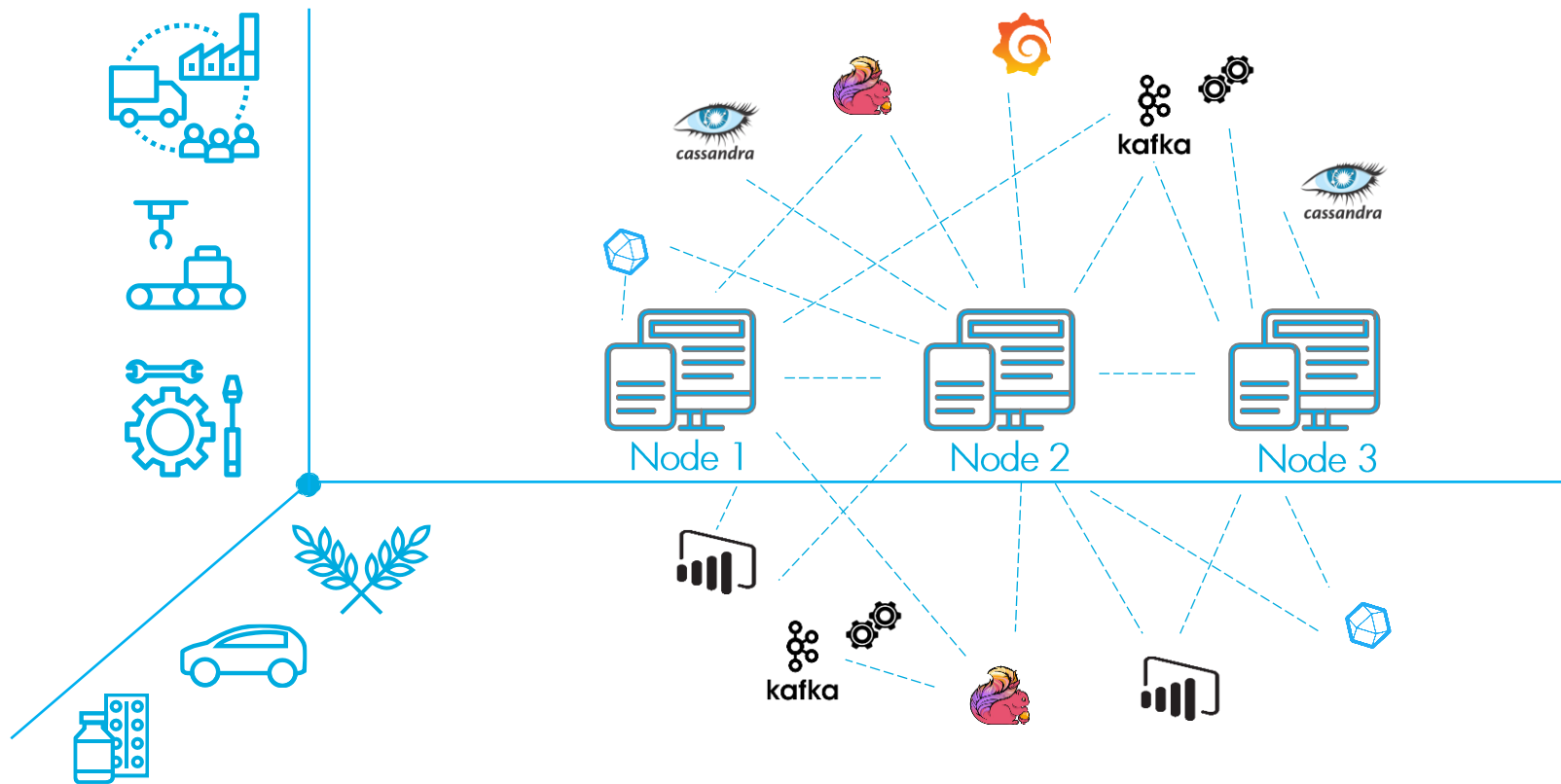




Node 1





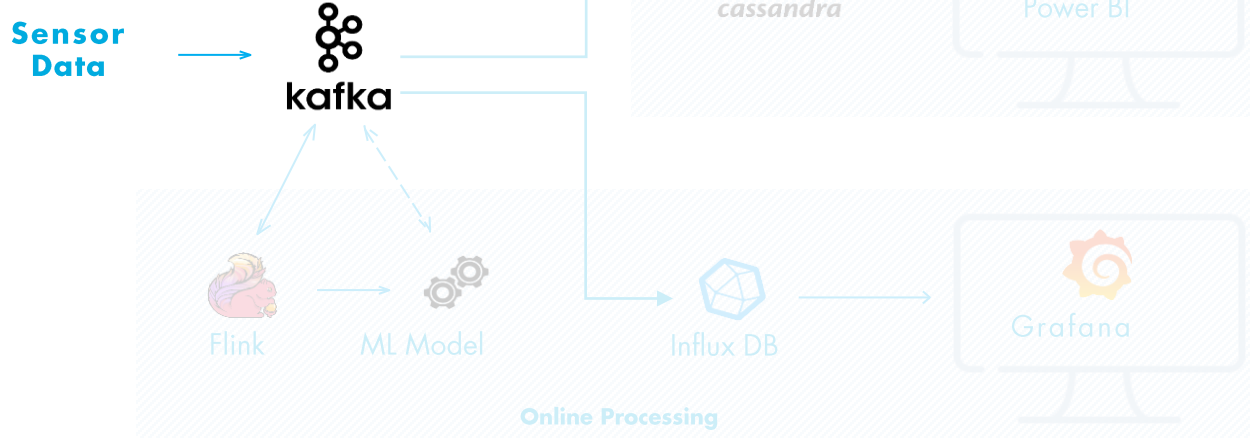




Data Governance & Legal Compliance



TLS PROTOCOL STACK





DATA GOVERNANCE



On premise



**Protected by the system itself and
privacy policies of all the components**



On cloud



GDPR

Does not apply



Risks Management & Quality Assurance



Risks



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Data & Security



Quality & Risks



Data Quality

Absence of data
Incorrect data

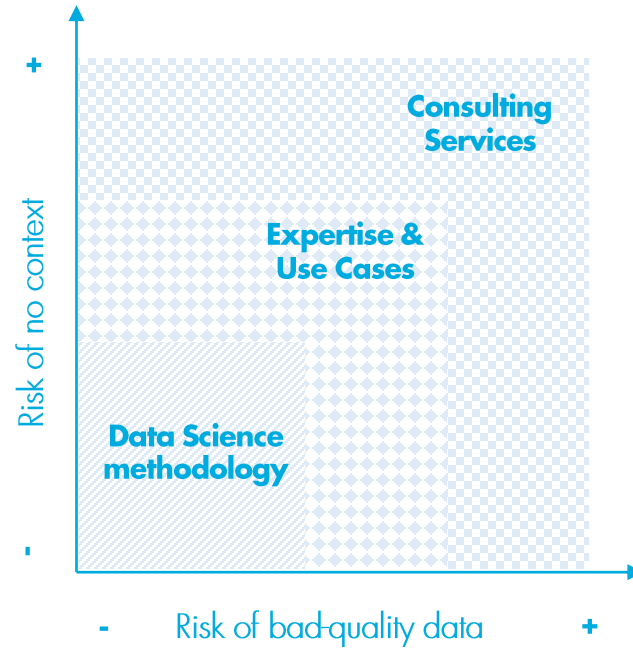


Lack of Context

Maintenance actions
Environment
Plant experts' hypothesis
...



MITIGATION STRATEGIES (GENERAL)



1 The Challenge



2 The Platform



3 Architecture
& Innovation



4 Scalability
& Flexibility

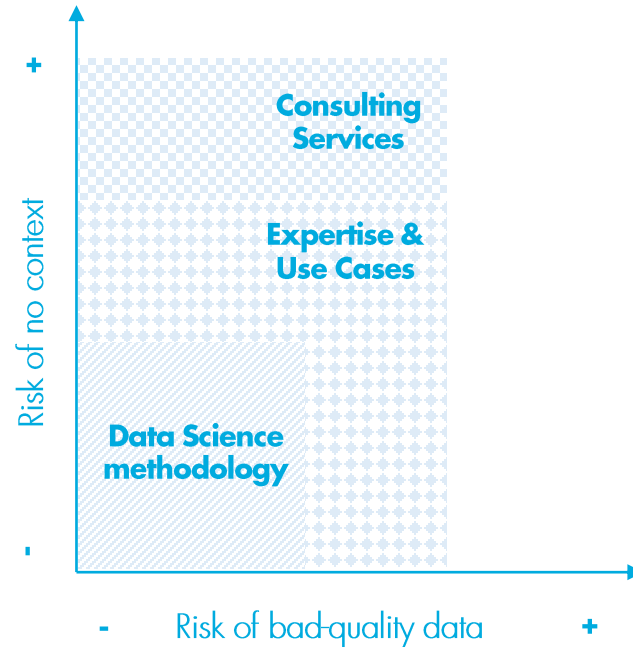


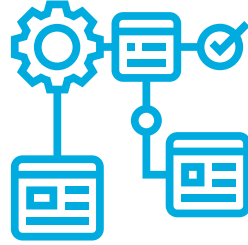
5 Data & Security



Quality & Risks

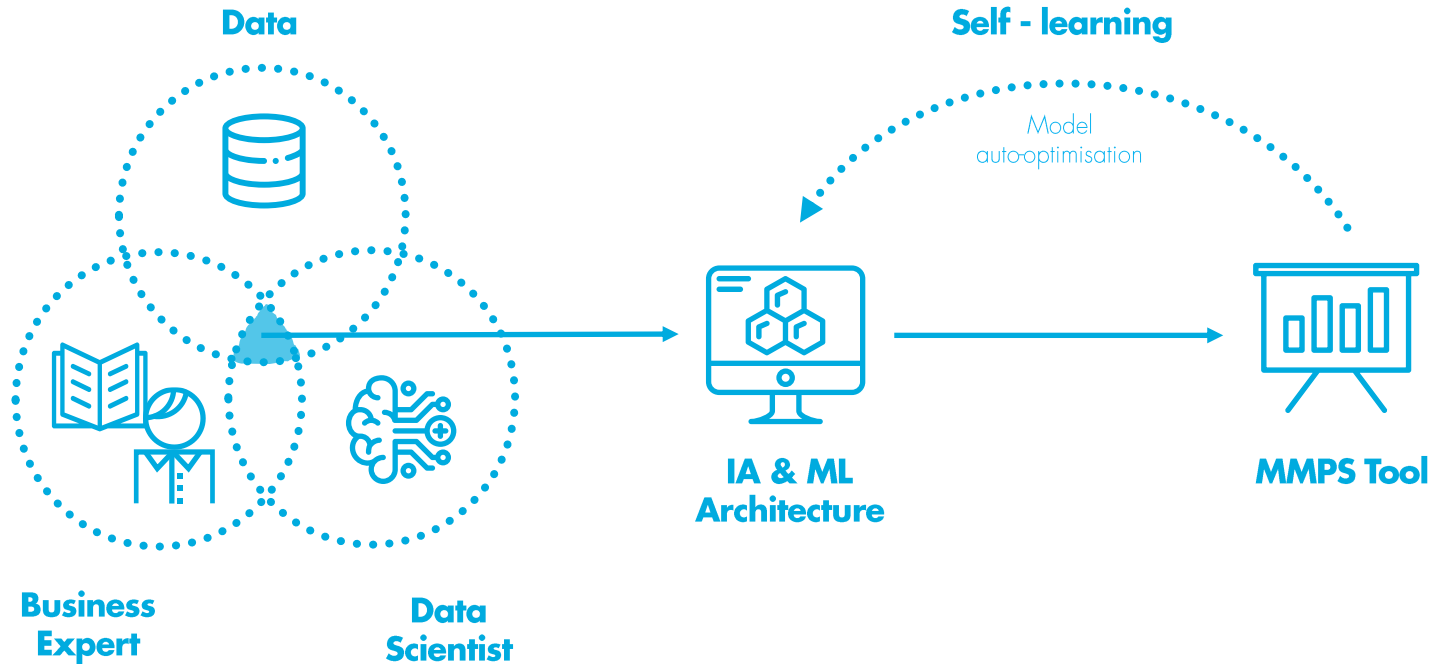
MITIGATION STRATEGIES (REACH)





Quality assurance

ELARA'S CORE METHODOLOGY



A close-up, low-angle shot of a human hand reaching out from the bottom right towards the center. The hand is dark and appears to be wearing a glove or is in shadow. The background is a soft, out-of-focus blue with a large, bright, circular light source in the upper center, creating a bokeh effect. The overall mood is contemplative and hopeful.

**Coming back
to the beginning**

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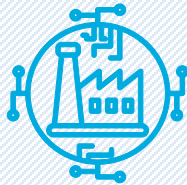
Data & Security



Quality & Risks

MAINTENANCE OPTIMIZATION

Need



Must



Make the most out of your machines

MMPS



The Challenge



The Platform



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Scalability
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Data & Security



Quality & Risks

www.elara.es

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Thanks!

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