



# ASTRIIS

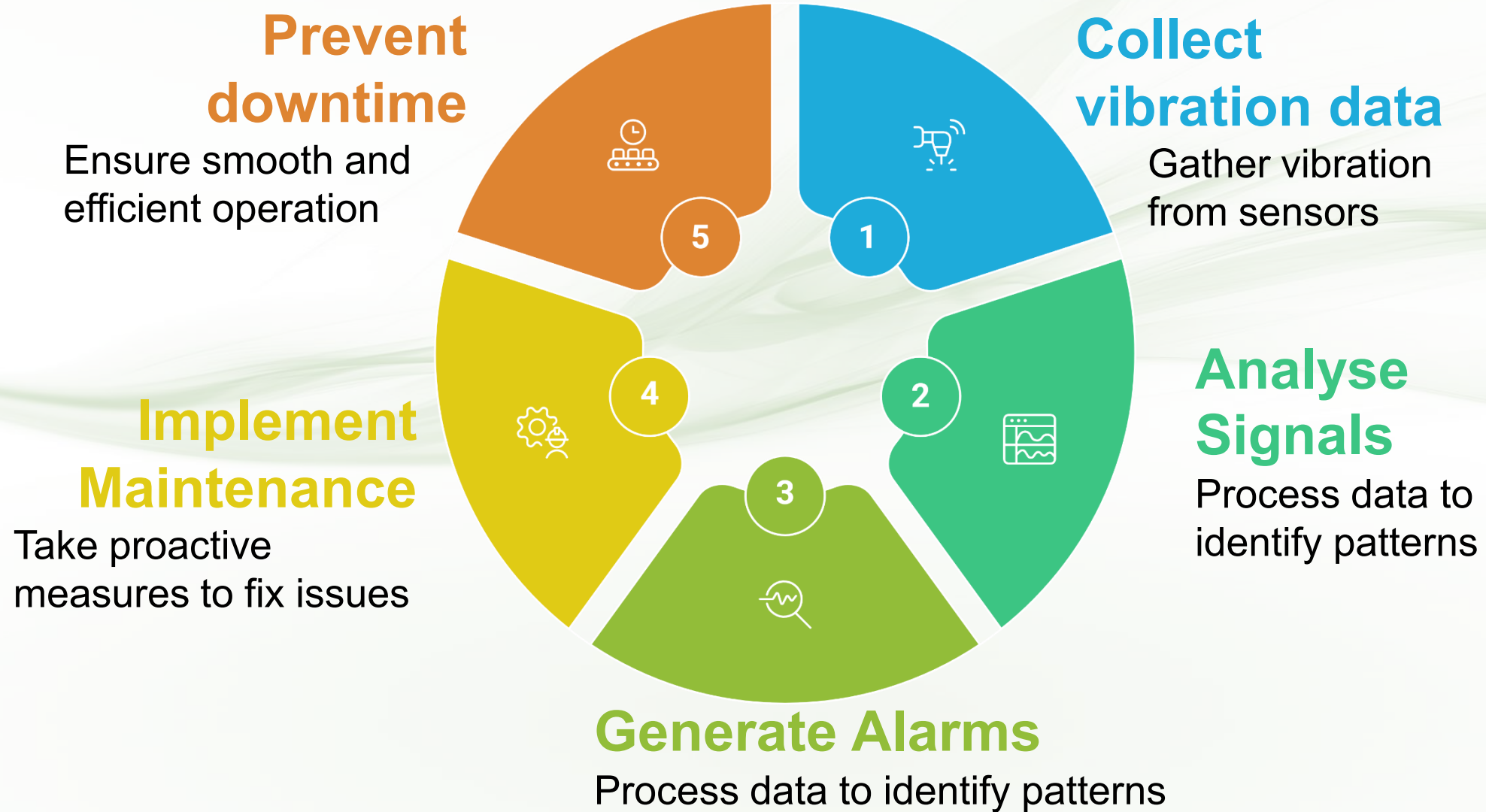
Towards zero failure

**Boosting your efficiency:  
Predictive Maintenance for  
Critical Industrial Rotating Assets**



Secret  Confidential  Restreint  Public

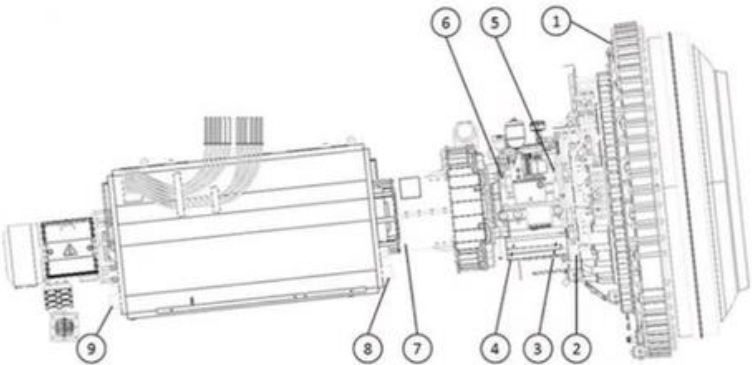
# The Power of Spectral Analysis in Predictive Maintenance



# Operational data shared with us from Costa Rica



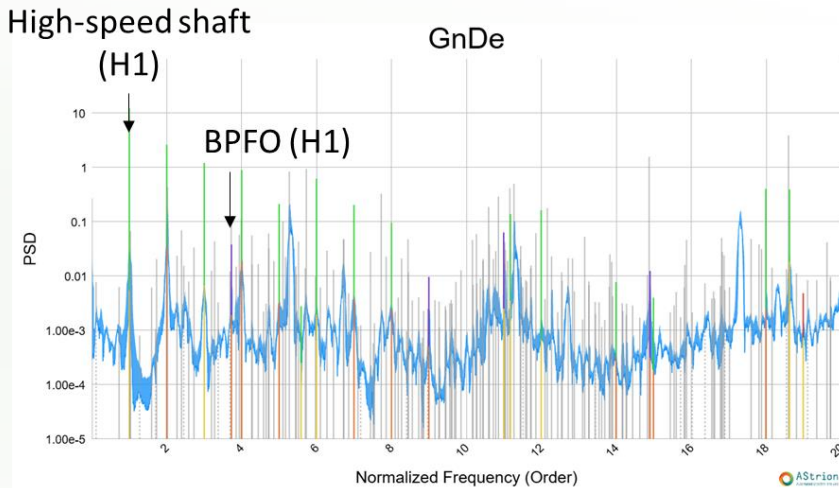
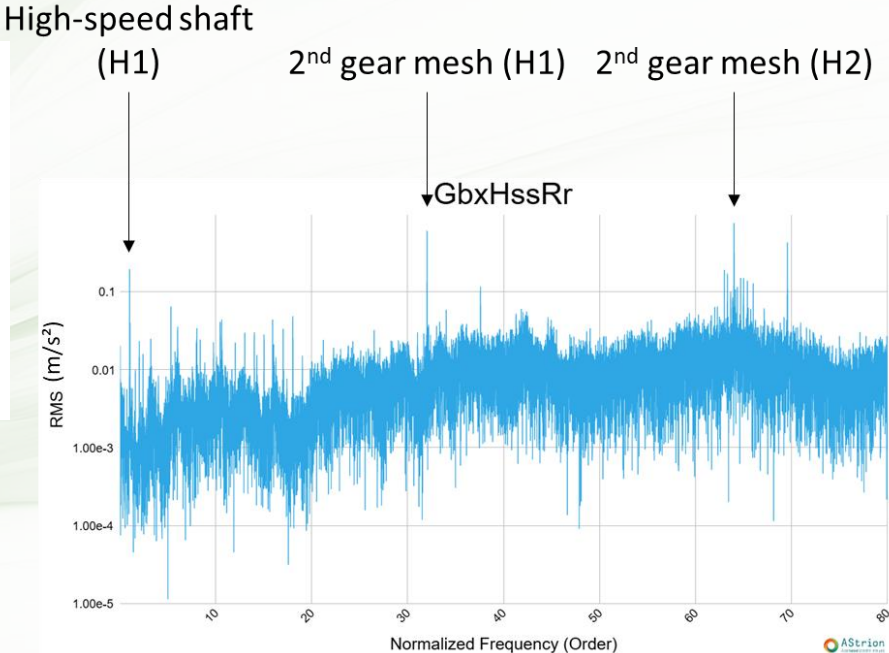
**Sensor #8 Analysis**  
High vibration levels detected





**Gearbox Signal Decomposition**  
Shaft unbalance identified



**Generator Side Issues**  
Driving End Bearing fault observed



# Mainstream Predictive Maintenance software: Challenges

<p><b>Pros</b> </p> <hr/> <ul style="list-style-type: none"><li>○ Powerful tool</li><li>○ Versatile applications</li></ul>	<p><b>Cons</b> </p> <hr/> <ul style="list-style-type: none"><li>○ Expert dependence</li><li>○ Limited scalability</li><li>○ Software &amp; Expert costs</li><li>○ Variability in analysis results</li><li>○ Undetected failures, Spurious Alarm</li></ul>
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# AStrion for efficient Predictive Maintenance

Automated Spectral analysis

## Early warnings

Provide 6-12 months of early fault detection

## Automated diagnostic

Eliminate reliance on human analysis

## Minimized CAPEX

Connect with COTS and all competitors' sensors and hardware

## Full equipment coverage

100% of spectrum parsed, all components monitored



# Our innovative process leveraging advanced algorithms

## Data Validation

Ensuring signal integrity for analysis



## FFT Transformation

Converting signals to frequency domain



## Automatic interpretation

Identifying abnormal spectral families



## Signal evolution tracking

Monitoring indicators changes over time



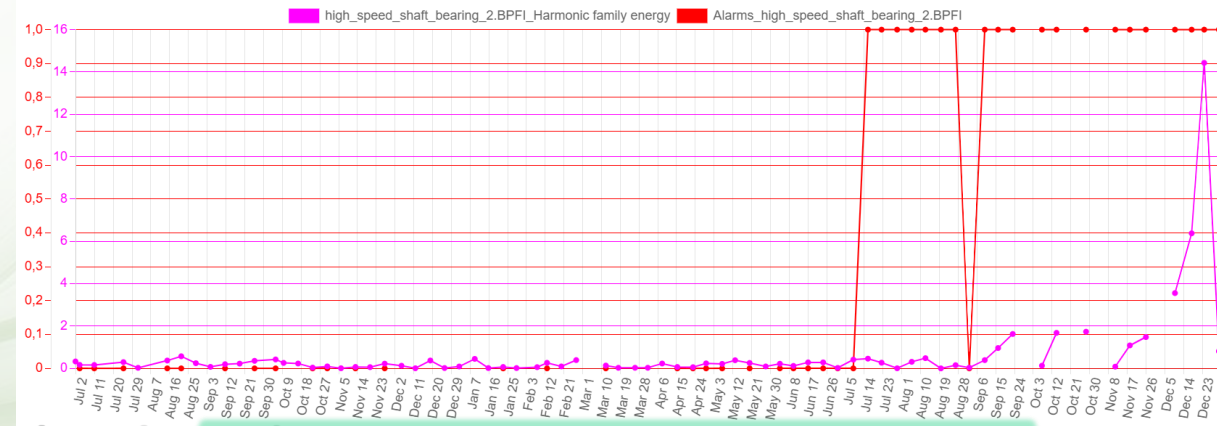
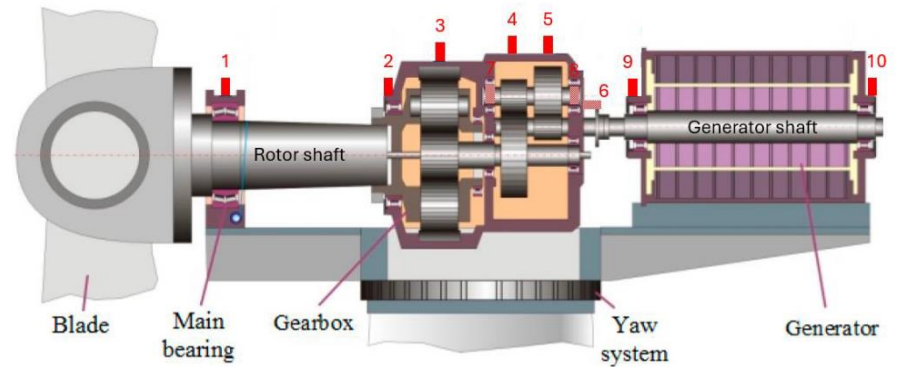
## AI-driven Alarms

Autonomous notification of issues and Workflow management



# Performance established from real-world example

## Vestas V150 4.2 MW



**Competing CMS**  
 « High Speed Shaft » alarm raised on **Sept, 15th** (VDI 3834 threshold)



**AStrion**  
 « high-speed shaft bearing 2 (generator) » alarm raised on **July, 15th**

	3 <sup>rd</sup> stage		High-speed shaft	
	Intermediate shaft		1	2
$f_{op}$	5.4500	5.4500	8.0900	9.0400
$f_{ip}$	6.2167	6.2167	10.9100	11.9600
$f_{rp}$	1.9903	1.9903	3.1450	3.4100
$f_c$	0.1306	0.1306	0.4300	0.4300

Table 8 : Damage bearing frequencies of the 3<sup>rd</sup> stage of the gearbox in order relative to the high-speed shaft.

## Competing CMS



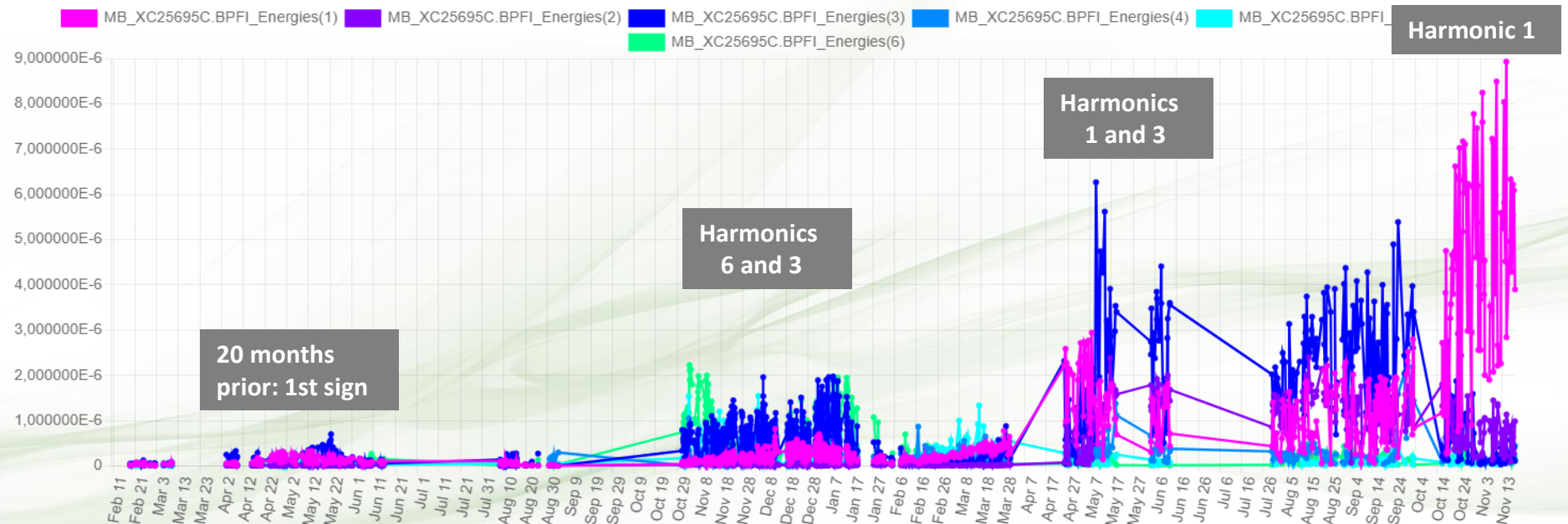
# December 30, 2015

## Breakdown : €1 million cost , 1 year downtime



Shared with us vibration data recorded over the years 2014 and 2015  
AStrion algorithms raised Alarm on the defective component  
10 months in advance

Use\_case\_AStrion/Wind\_turbine\_Main\_bearing\_failure\_inner\_race/VIB2\_PLANETARY\_GEAR



Arfons wind farm,  
FRANCE  
11 wind turbines  
of  
2 MW each

# Benefits for Wind Farm Asset Management optimization



# Application and benefits for Small Hydro Power Plants

## Bearing and plain bearing

Highlights faults affecting balance and dynamics.

## Shaft and alignment

Focuses on alignment and balancing problems affecting rotation.

## Hydraulic System

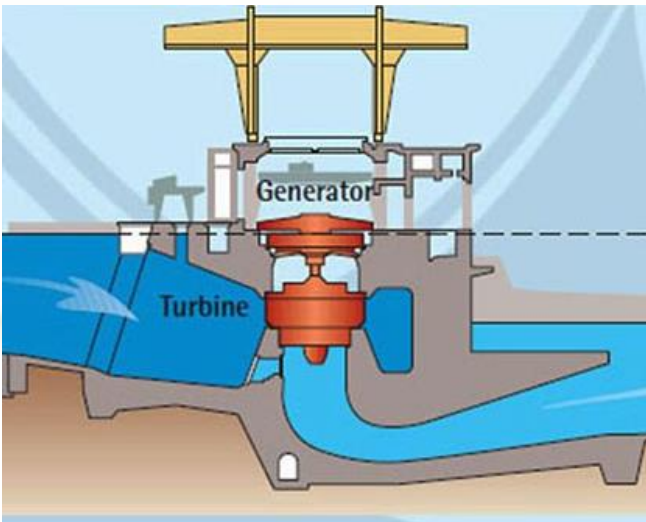
Focuses on vibrations, cavitations and imbalances in turbine systems.

## Gear Box

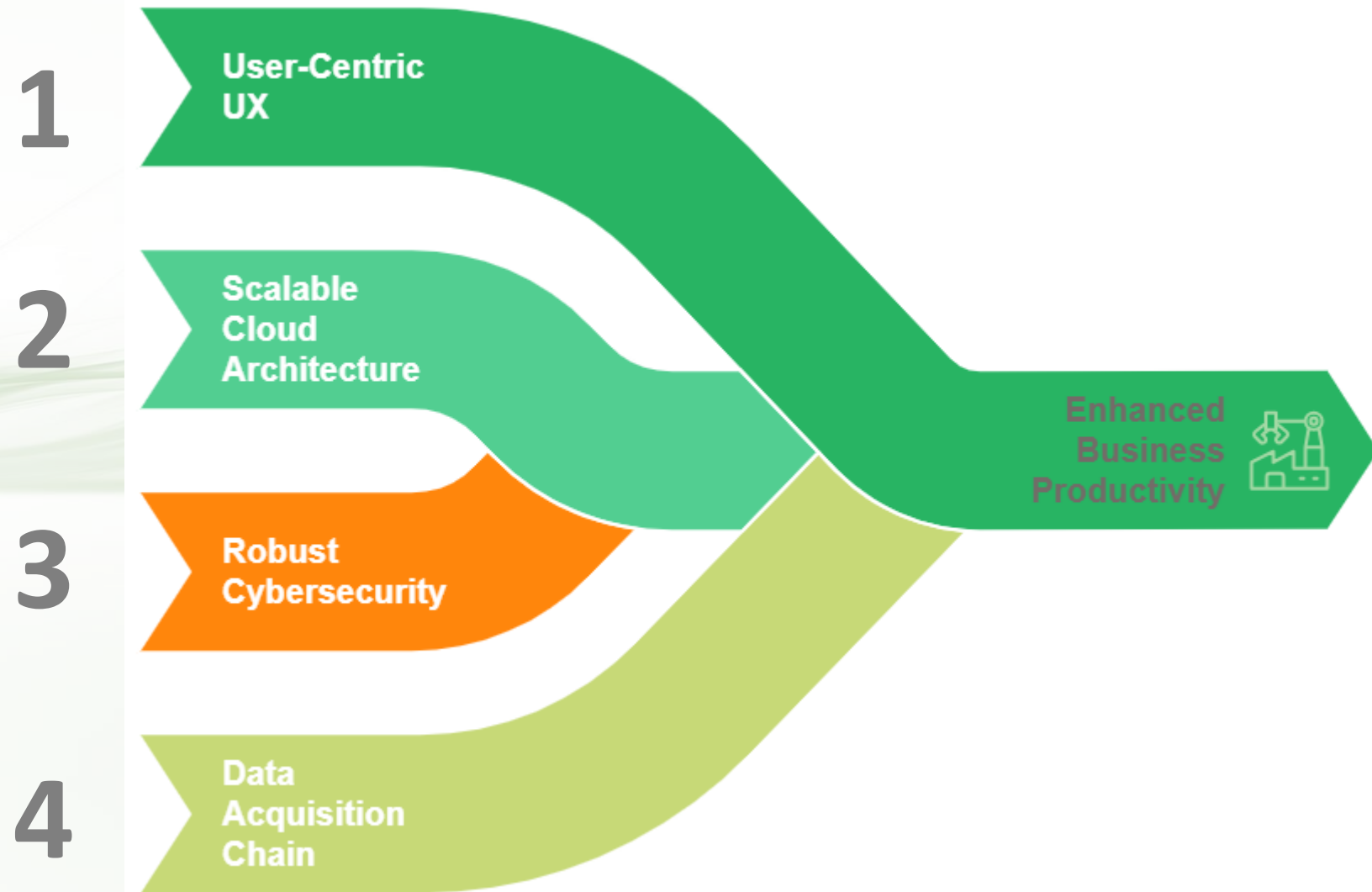
Includes backlash, gear wear, resonance and shock in machines and gearboxes.

## Electromagnetic

Phase imbalance/armature or rotor faults



# Additional differentiation – Key Features



# Assessment of the project's environmental impact



**BIG BOOSTER**  
Auvergne-Rhône-Alpes  
THE INTERNATIONAL ACCELERATOR  
FOR POSITIVE IMPACT

**Efficient Industry**

**Reduced Carbon Footprint**

**Prevent Accident**

- 1. In **2027**: 8.7 GW wind power monitored by AStrion
- 2. + 67 GWh ENR production CO2e production avoided thanks to AStrion:  
4,402 tCO2e / year in **2027**

# OUR TEAM

Partner - Founder



**Nadine MARTIN**  
Scientific Director

R&D, Strategic and technological advice, Academic and industrial collaborations



**Mathieu Desbazeille**  
Expert Vibration Analysis & Mechanics

Partner - Founder



**Paul ROY**  
Technical Director

Product Development & Industrialization, division of user stories into tasks



**Igor Zachial Pierre Arquier,**  
**Bruno Baudru**  
Senior Fullstack Dev

Partner - Founder



**Pascal GAIN**  
Sales Director

Strategy, Marketing & Communication, Business Development, Partnerships, Sales

Partner - Founder



**Nicolas SAUBIN**  
President  
Finance HR

Finance, Management control, legal, human resources , investor relations, Purchasing



**Laurent ROME**  
Product Owner

Definition of the MVP in agile mode (planning & Budgets), prioritized backlog , customer interface and development team



**Hortense De Lagarrigue**  
Office Manager

# Edge that set Us Apart

## Cost Efficiency

Provides cost savings and faster ROI

## Seamless Integration

Ensures easy integration with existing systems



## Advanced Predictive Analytics

Utilizes AI for deeper diagnostics and early fault detection

## Industry Adaptability

Offers versatile solutions across multiple sectors

# Ideas for POC projects in your organisation ?



Wind turbine condition monitoring



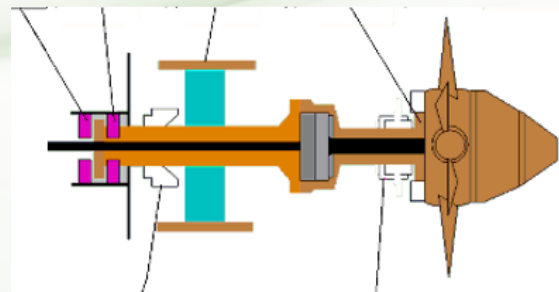
**jll.spear** 50 to 200 sensors for roller monitoring



Monitoring rollers and kilns  
Rotating Tubes



Monitoring wheels, axle box, universal joint and drive axle



Hydro power plants



**suez** Incinerator draft fans