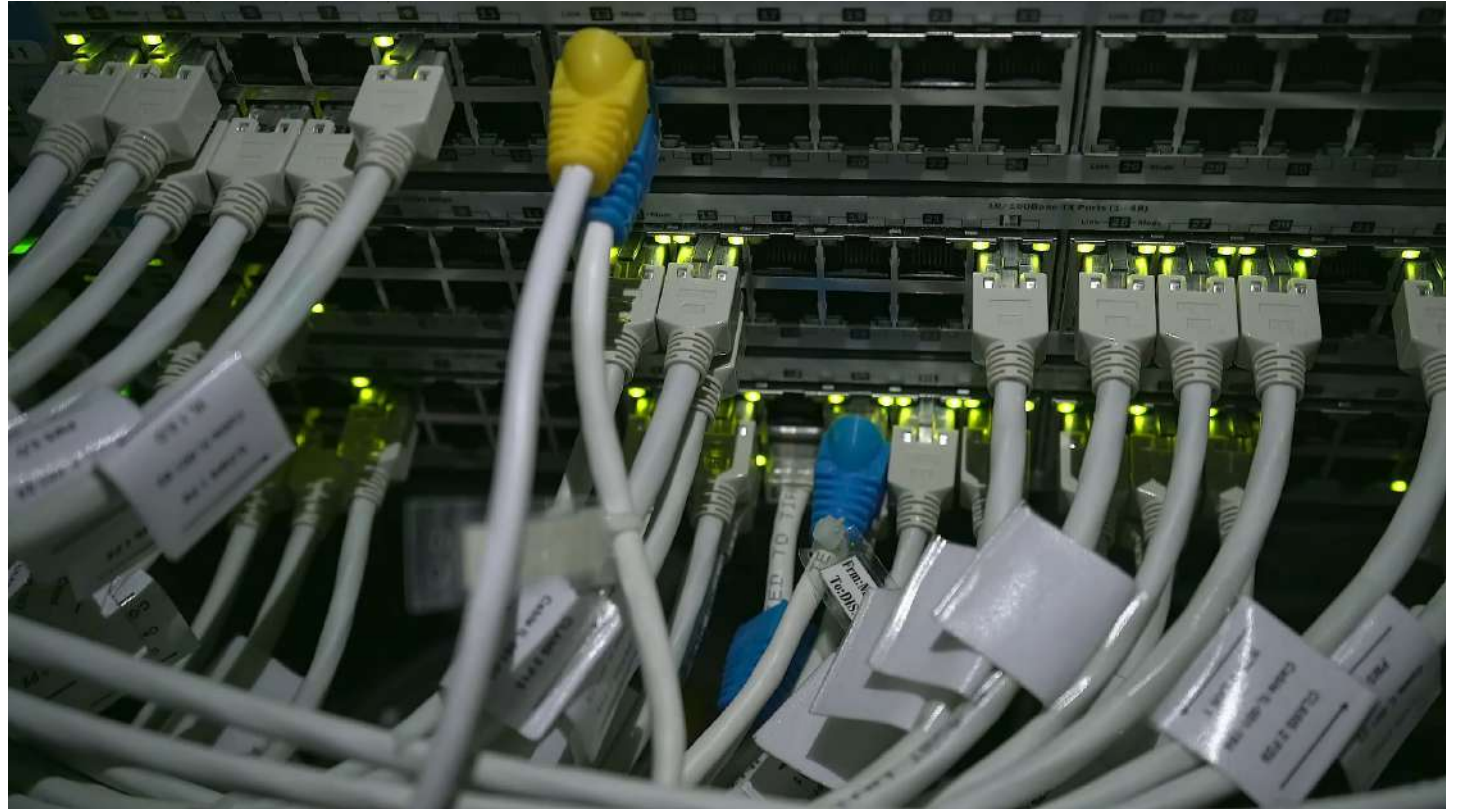




New Generation Sensors Srl

www.ngs-sensors.it



Funded in 2015

Spin-off company della Scuola
Superiore Sant'Anna.

Solutions:

Smart Logistics

- Cargo
- Last mile

Smart Factory

- Predictive maintenance
- Industrial monitoring



Scalable IoT systems and solutions

Hardware and Software

IoT Cloud platform and analytics

Consulting and customization

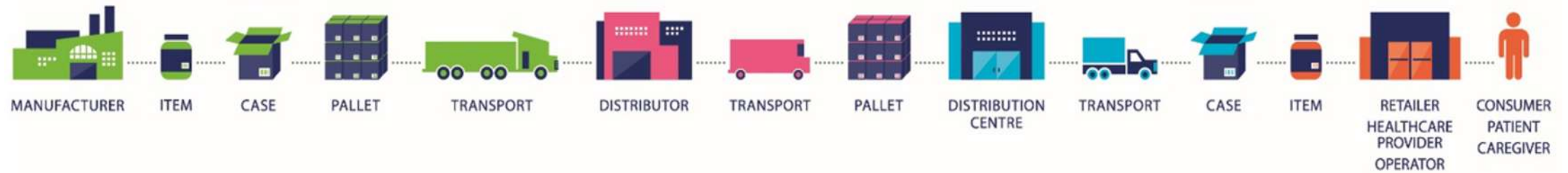
TrackOne

NGS solutions
for Smart
Logistics

NGSsrl 
New Generation Sensors



The problem: why?



Not
optimised
logistics

- Empty vehicles
- Static routes

Shipment
safety

- Goods monitoring
- Impossible real time decision making

Customers'
satisfaction

- No Real time reporting
- Data access

Complete
visibility of the
supply chain

IoT vs. Logistics 4.0

Track&Trace&Monitoring to enable the supply chain complete visibility.
Answering the following 4 questions:

What?

Where?

When?

How?

**Goods&Assets
identification** using
standardised coding
and APIs

**Where and when are
the goods. T&T
services for Cargo and
Last Mile Logistics.
Specialised goods
monitoring.**

**Improved granularity,
tracking the
encapsulation
consolidation.**

**Feature extraction, to
simplify the supply
chain understanding**

The Smart Container

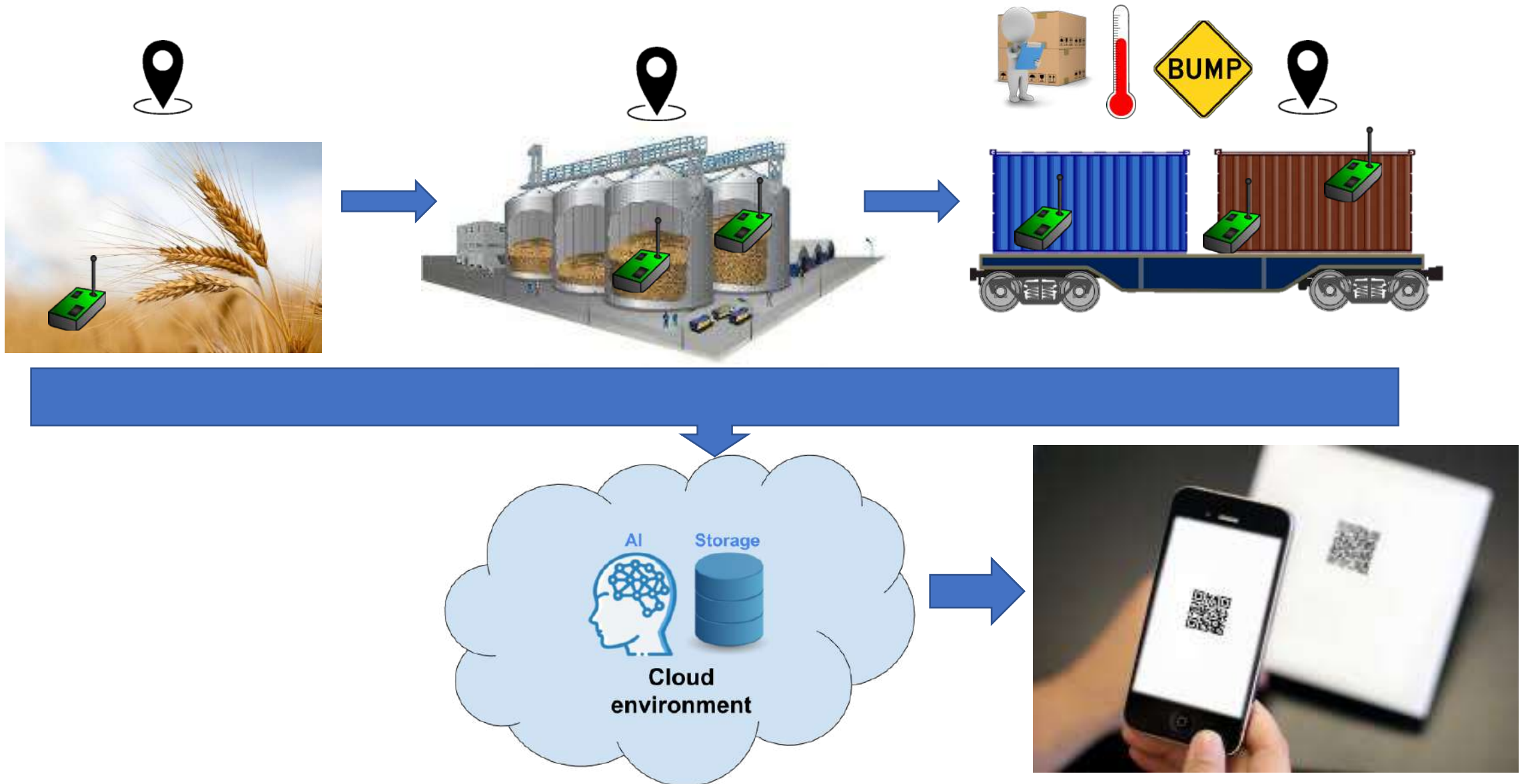
Container tracking



Container tracking & monitoring



“Made in” tracking



Added values, advantages, architecture

Open, scalable, horizontal

T&T&M at improved granularity.
Dedicated monitoring - on-going

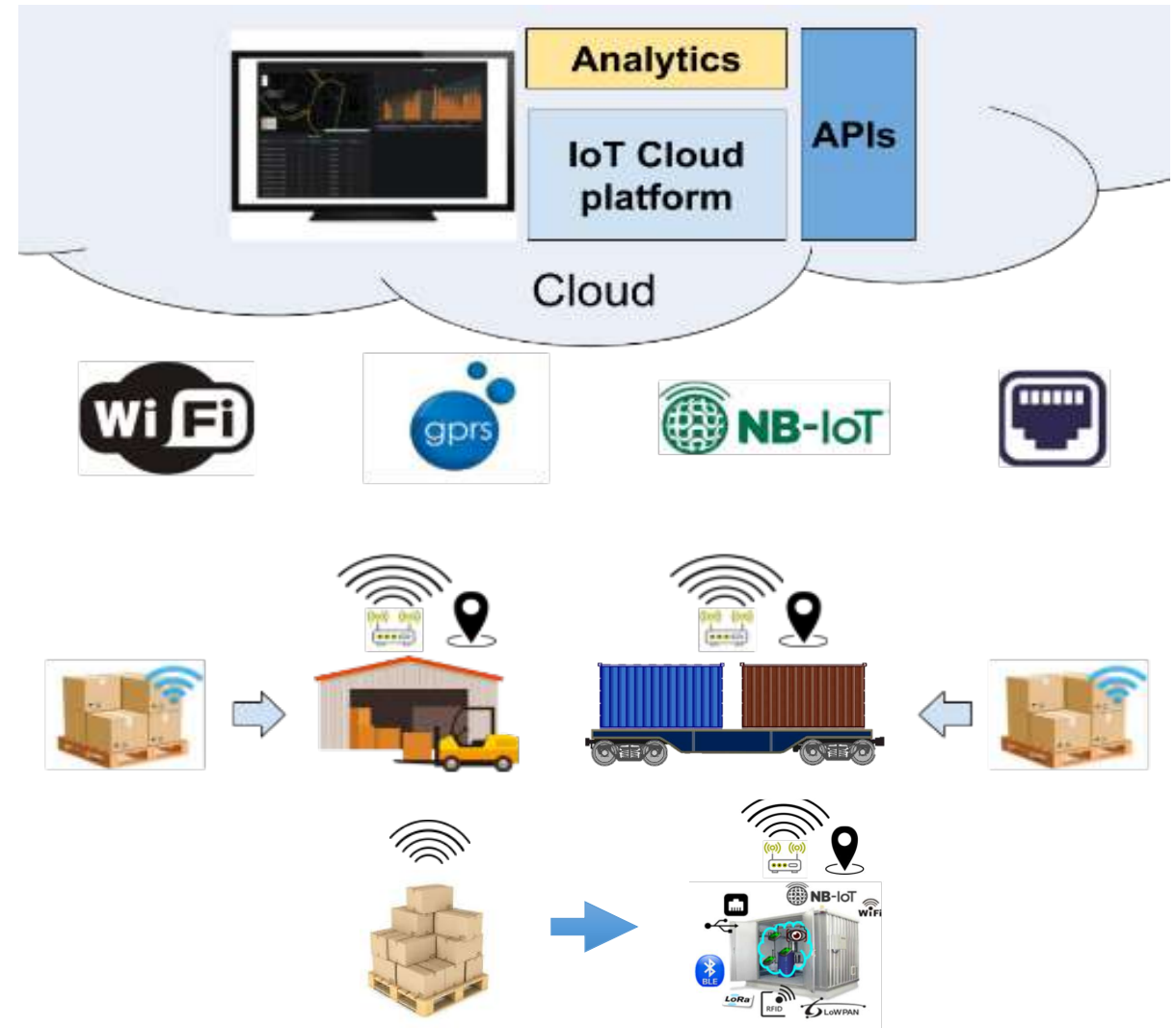
Multi-users standardized access (GS1
EPCIS) - ongoing

Asset management & circular economy
- ongoing

Reactive and real-time platform, Real-
time data processing

Trusted and distributed ledger
(blockchain) - ongoing

Proprietary technologies and internal
know-how



A close-up photograph of a uFLEXX board, showing various electronic components like capacitors, resistors, and integrated circuits on a printed circuit board. The board is populated with numerous components, including several large black integrated circuits and smaller surface-mount components.

uFLEXX board

Communication & Positioning

- GPRS/NB-IoT
- GPS/GLONASS

Battery management

- Battery charger
- Battery level measurement

On-board sensors

- Acceleration sensor
- Temperature and humidity sensor
- Light sensor

IoT interface

- BLE 5.0 (ongoing)
- IEEE802.15.4 (ongoing)



TrackOne Node - Tracker



Position and time

On board sensors

- Temperature & Humidity
- Acceleration
- Light (on-going)
- Battery level

Events' generation

- Bumps&shocks
- Open&close the door (on-going)
- Threshold exceedance

Battery powered

- Li-Ion 10Ah 12V battery
- Duration 4months (@10min)

Internal buffer

TrackOne Cloud Application



Scalable data ingestion



Data storage



Analytics

Feature extraction -
Aggregated data



Visual and real-time reporting

Web interface & Pdf reports

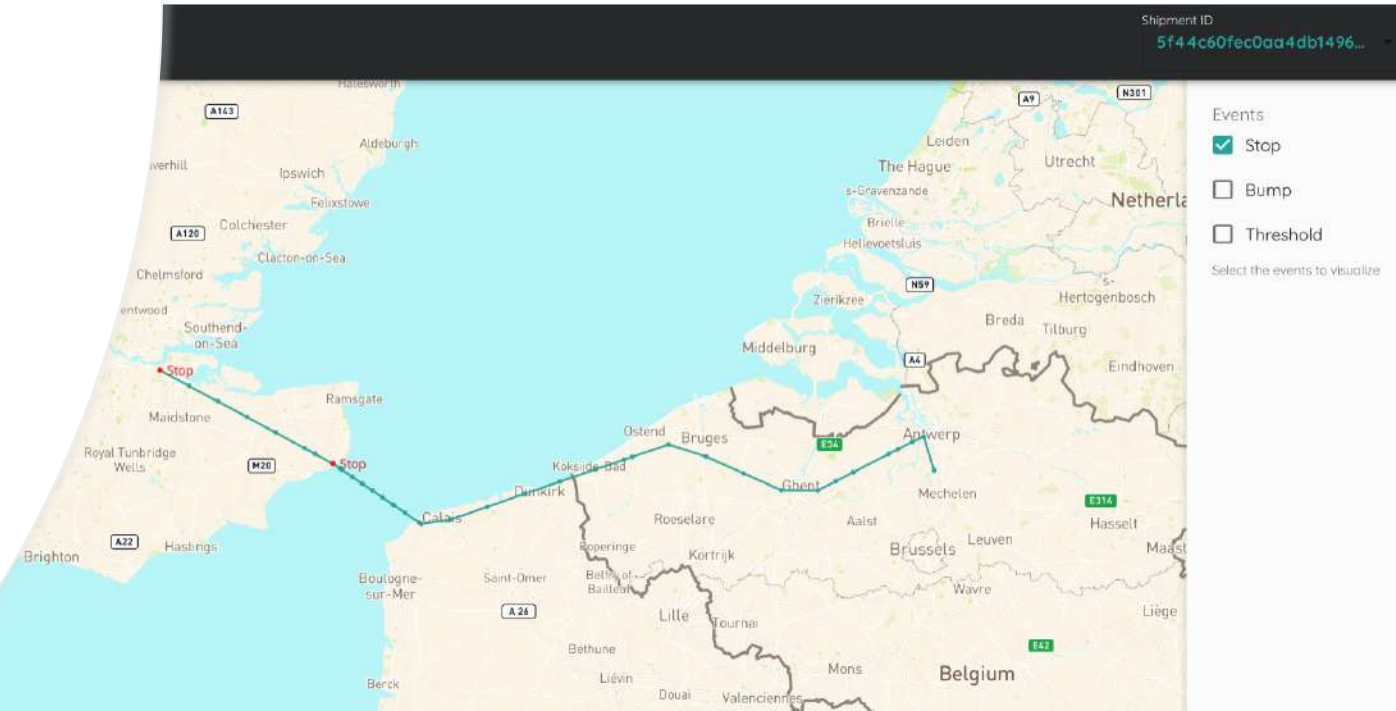



APIs (HTTPS)



- Order and shipment management
- Access and users' management
- Track, Trace and Monitoring visualization
- Pdf generation and download

- Order and shipment management
- Access and users' management
- Track, Trace and Monitoring visualization
- Pdf generation and download

☐ Show Mean



PlantOne Toward the Predictive Maintenance democratisation



The addressed problem

Problem



Electric motors and machineries are one of the main asset in manufacturing companies



Their faults can generate several problem in the industrial processes



SOLUTION: predictive maintenance programs

Benefits

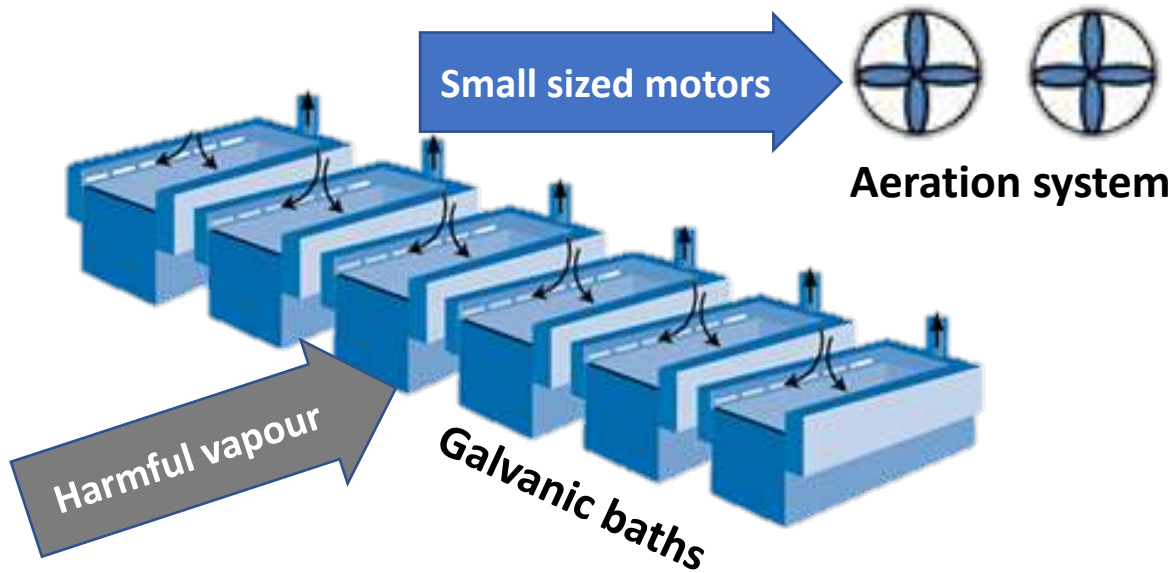
Predictive maintenance:

- Low repairing costs
- reduced downtime
- Improved safety
- increased energy efficiency
- savings in employees' time



4.0
industry

Predictive maintenance democratisation



A galvanization plant uses dangerous chemicals liquids that can generate harmful vapours (hydrogen cyanide).

Similar environments & potential clients

- Tanning industries
- Paper industries
- Soft materials
- Automotive



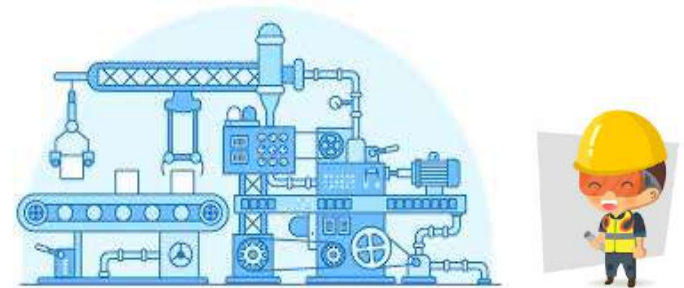
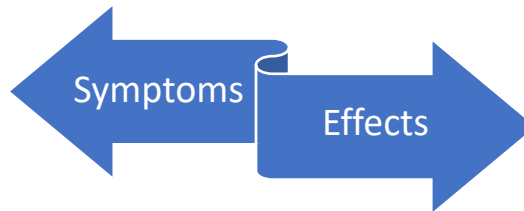
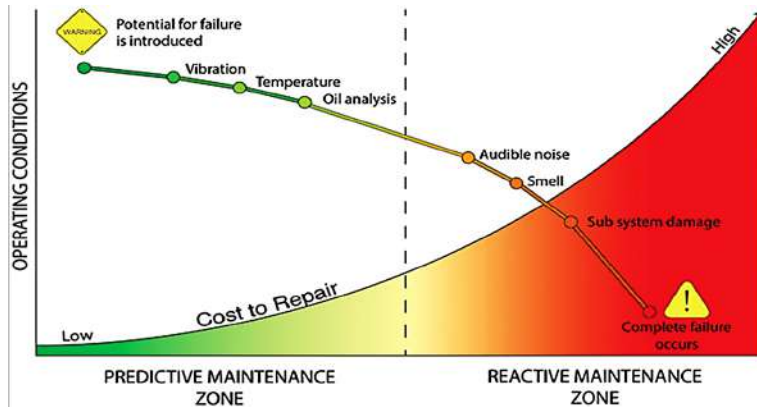
Our solution: the PlantOne system

Un-monitored
motors and
machineries



PlantOne system

- Retrofit
- Flexible
- Plug&Play



Added value and advantages



Open, scalable,
horizontal



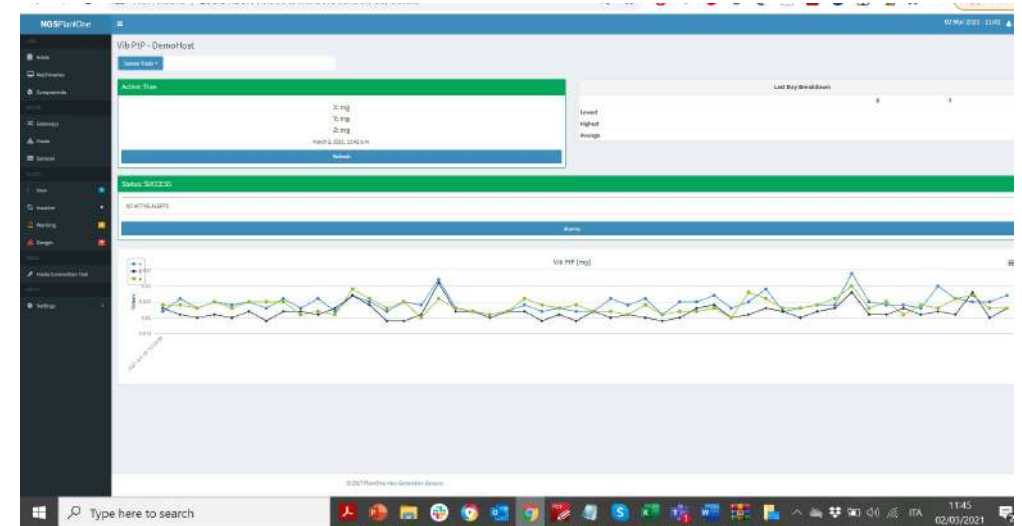
In network
interaction logics



Money saving
through retrofit



Reduction of
downtime



Reduction of
maintenance costs



Scheduled
maintenance



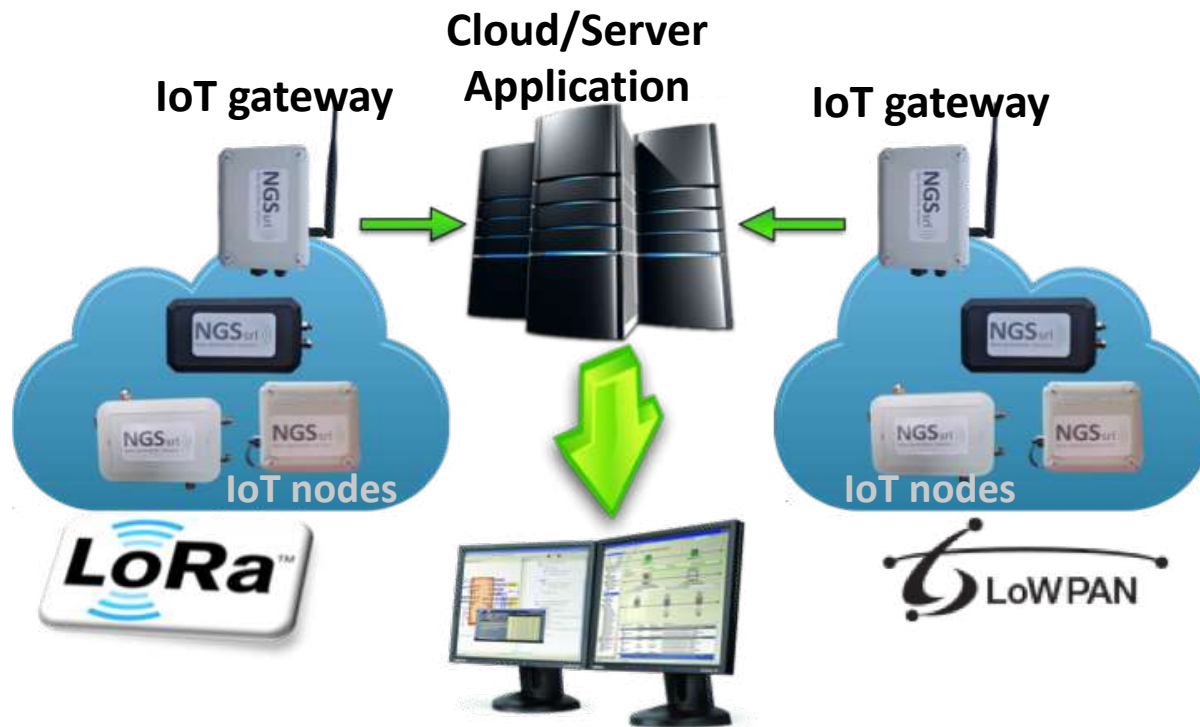
Worker and
environmental
safety improvement



Continuous
improvement (ISO
Certifications)



Architecture



Collection of data from machinery and facilities exploiting proprietary hardware

Measuring and monitoring both malfunctioning symptoms and effects

- Symptoms: Vibration sensor, Contact temperature sensor, Drowned current sensor
- Effects: Pressure sensor, Gas sensor
- Possibility of integrating 4-20mA senso

NGS – Predictive Maintenance

Smart PlantOne –The sensors

Collection of data from machinery and facilities exploiting proprietary hardware

Measuring and monitoring both malfunctioning symptoms and effects

- Symptoms: Vibration sensor, Contact temperature sensor
- Effects: Pressure sensor, Gas sensor
- Possibility of integrating 4-20mA sensor

Smart sensors capable to collect and process locally data, exploiting AI



Predictive maintenance sensor



Thermal monitoring

- Contact temperature sensor probe
- Magnetic or with screw

Vibrational monitoring

- Triaxial accelerometer

Alarm triggering

Battery powered (optional)



Temperature sensor Specs

Sensor Type	PT100 probe
Temperature Range	-40°C +150°C
Precision	Less than 1°C

Vibration sensor Specs

Sensor Type	3 axial vibration probe
Precision	1024 counts/g 2G 512 counts/g 4G 256 counts/g 8G
Measurement range	2G/4G/8G
Sampling period	200Hz
Measured parameter	P2P and RMS on the burst The complete burst on demand



Pressure sensor



Honeywell PX2.



Differential sensor sealed gauge

Operative range: 0-250 psi

Precision: 0.25%

Working temperature: -40 °C, 125 °C

Application

- Monitoring HVAC systems
- Compressor system
- Oil pressure

Gases' sensors



Electrochemical sensor

- CO
- Ethylene
- Hydrogen cyanide

Possibility of integration of compliant sensors

- Alphasense sensors



Simple Gateway

Bridge between the IoT e Internet

Local network management

Ethernet connection

Remote control

Local storage (in case of connectivity loss)

PlantOne: the app for the industrial monitoring

Data collection from the fields

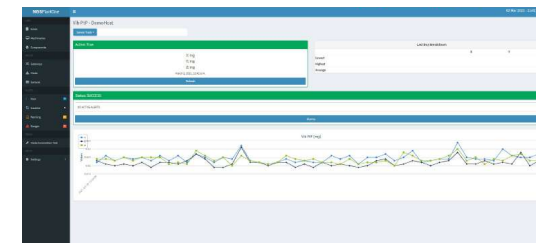
- From NGS gateways
- From third parties gateways
- From PLC

Storage

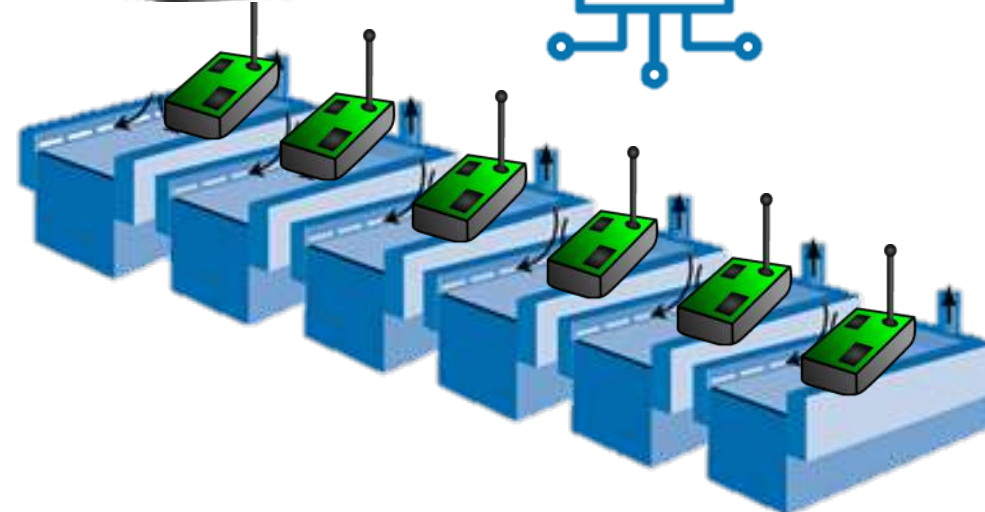
APIs

Graphical interfaces

For Cloud or server

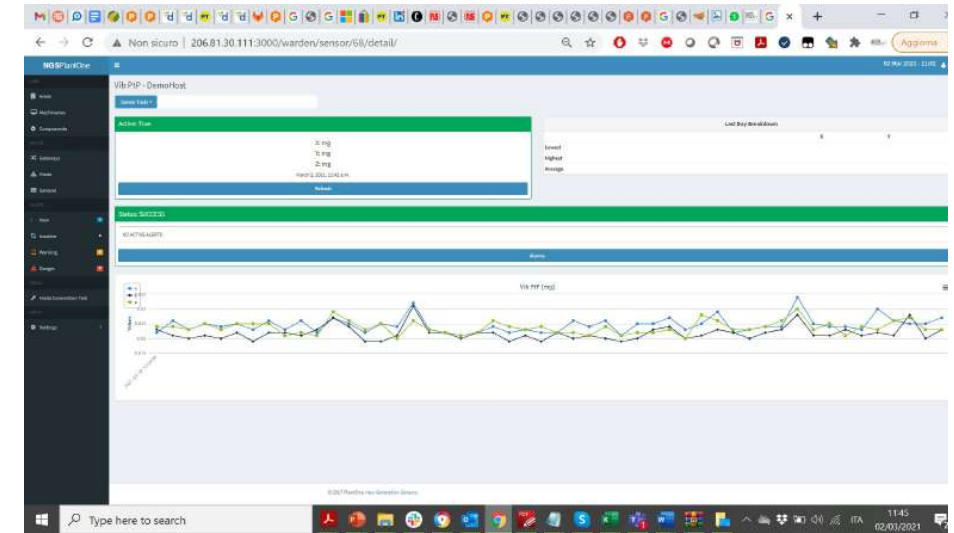


Raccolta
dati



PlantOne: web graphical interface

- Hierarchical organisation
 - Area
 - Machinery
 - Component
- Data visualization and management
 - Plot e table
 - Event and thresholds
- IoT nodes and gateway management
 - Ping
 - Node alive



The screenshot shows the 'Advanced Tools - Configuration' page in the NGSPlantOne web interface. It displays a table of parameters (Vib Freq, Vib Window, Vib Period) with their last values, last update times, and new values. The interface includes a sidebar with navigation options like Areas, Machinery, Components, Gateways, Hosts, Sensors, and a 'New' button. The browser address bar shows the URL '206.81.30.111:3000/warden/sensor_configuration/55/'.

Parameters	Last Value	Last Update	New Value
Vib Freq	400 Hz	3 months ago	<input type="text"/>
Vib Window	2 s	3 months ago	<input type="text"/>
Vib Period	60 s	3 months ago	<input type="text"/>



Contatti

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www.ngs-sensors.it