



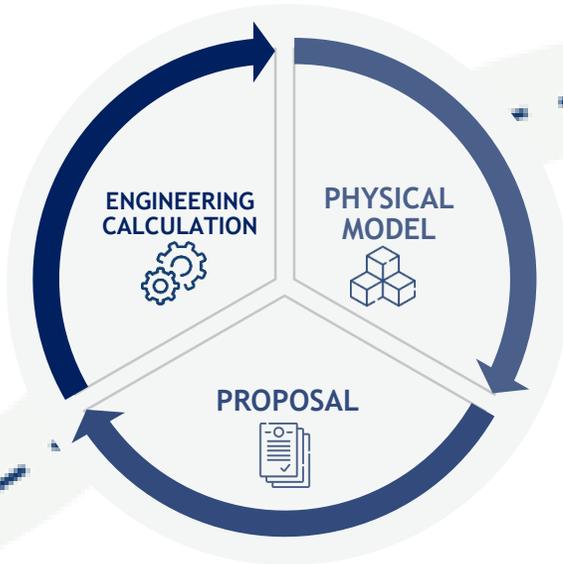
Artificial Intelligence to control and improve Ventilation Systems

■ Intelligent Ventilation



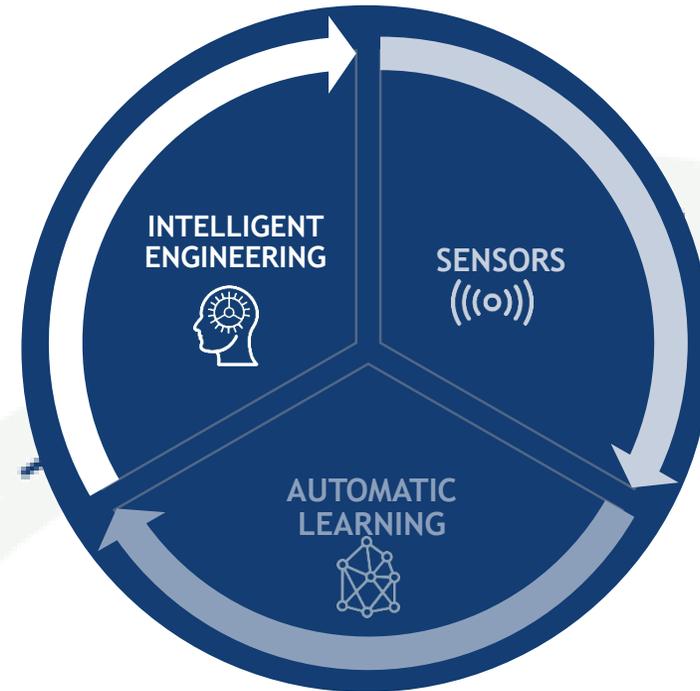
Intelligent Ventilation

Evolution towards disruption



TRADITIONAL VENTILATION

- Timely analysis of the situation
- Errors due the creation of a physical model of the reality
- **Not adaptive.** Changes require new studies



RESPIRA® INTELLIGENT VENTILATION

- **Permanent Analysis** of the situation
- **No errors.** Studies based on real data processing
- The **algorithm** understands and adapts to changes

Intelligent Ventilation

The advantages

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Efficient energy consumption management and improved environmental condition thanks to automatic ventilation control.



Efficient investment management thanks to detection of hot spots and / or problems within the facility.



Real time queries on the environmental conditions (temperature, humidity and air quality) and the predictions for the next 72 hours.



Real time queries on the comfort index, thermal sensation and air quality.



Real time queries on equipment operation, fast tracking maintenance works.



Different control modes. Efficient, comfort and saving modes.



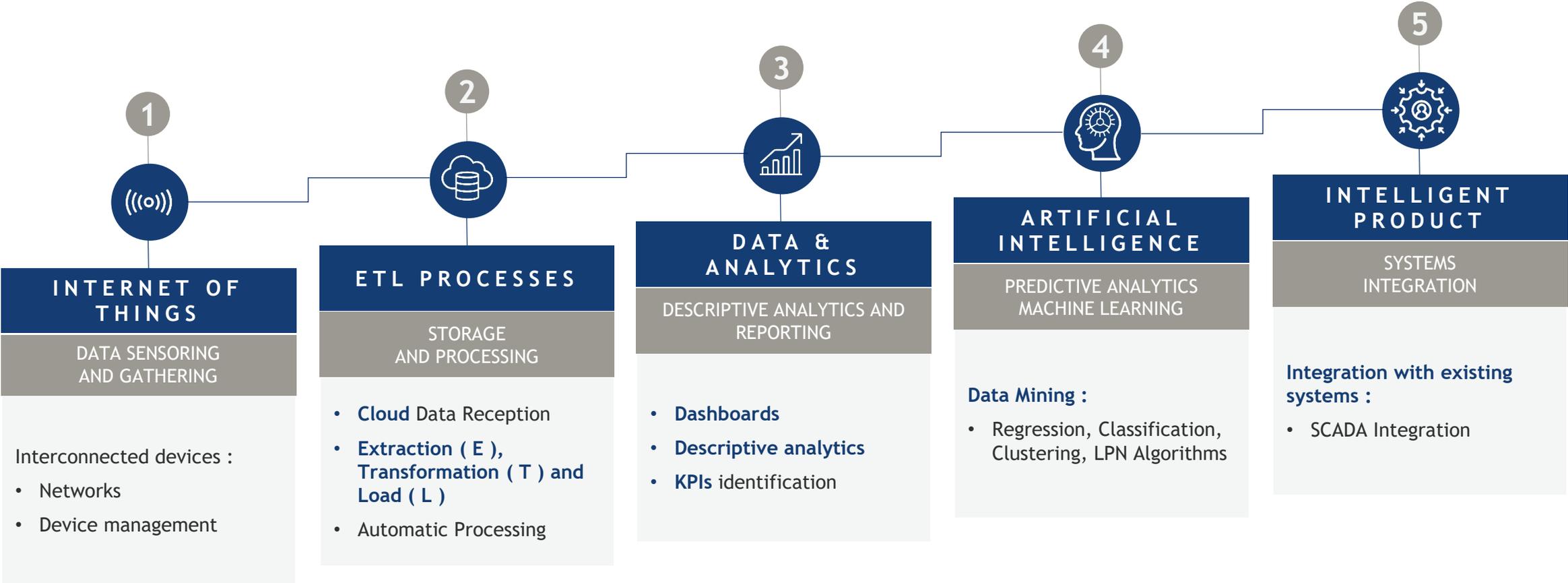
Automatic Retraining.



Flexible, scalable and fast deployment system.

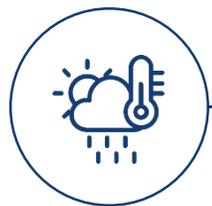
Intelligent Ventilation

Product 4.0



Intelligent Ventilation Architecture

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Information transfer
(historic data)

CLIENT SERVERS

Real time queries on optimum
ventilation strategy

Web platform access
and restrictions updates

CLOUD PLATFORM

Device Reading and Management
Data Storage and Processing
Algorithm Hosting and Training

USER / CLIENT

Intelligent Ventilation Web Platform



INFORMATION VIEWING

User friendly screens (latest data, historic data ...)



DATA EXPORT

Information access. Exported in Excel format



USER HANDBOOK / HELP

User guides and first steps. Contact email / technical support



SYSTEM RESTRICTIONS

System restrictions configuration and query



CONFIGURATION PARAMETERS

Algorithm set up tabs (operating modes ...)



Intelligent Ventilation RESPIRA® deployments

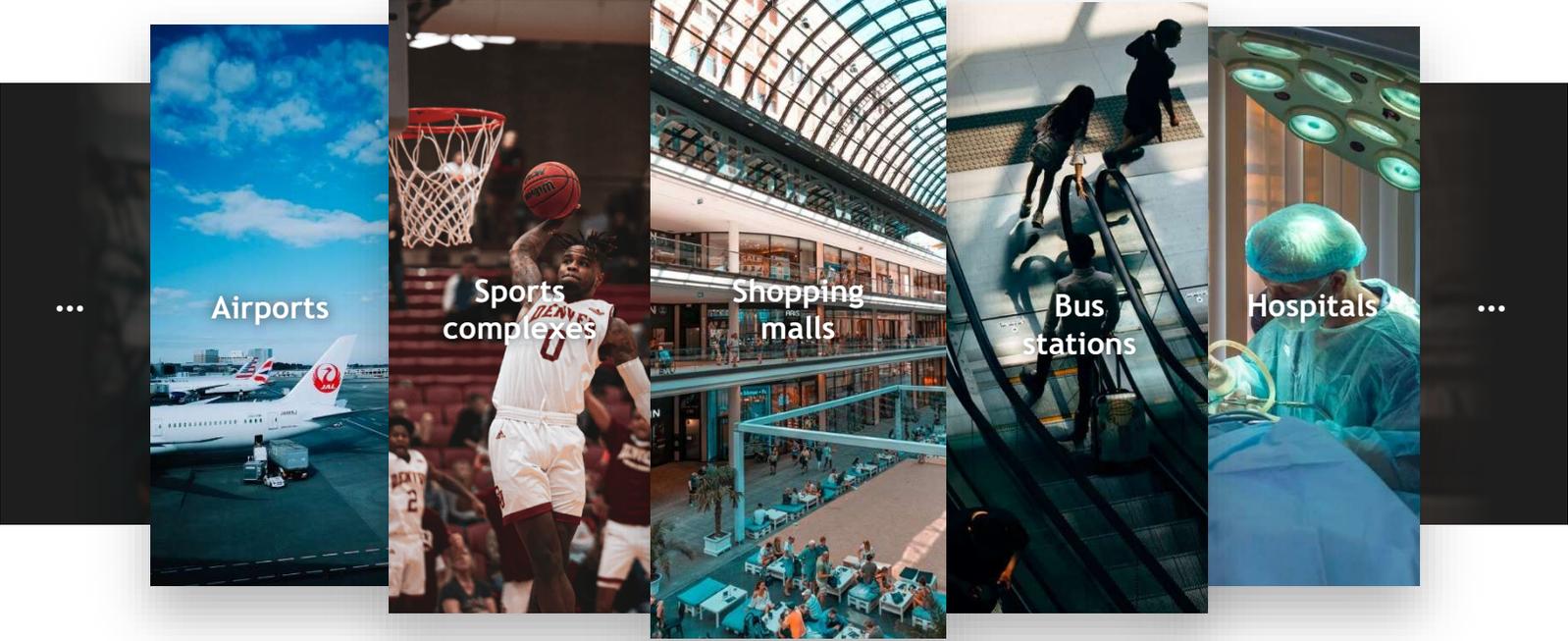
SUBURBAN TRANSPORT

Ventilation system



LARGE - SCALE INFRASTRUCTURES AND CONNECTED SPACES

HVAC



Intelligent Ventilation

Metro de Barcelona deployment

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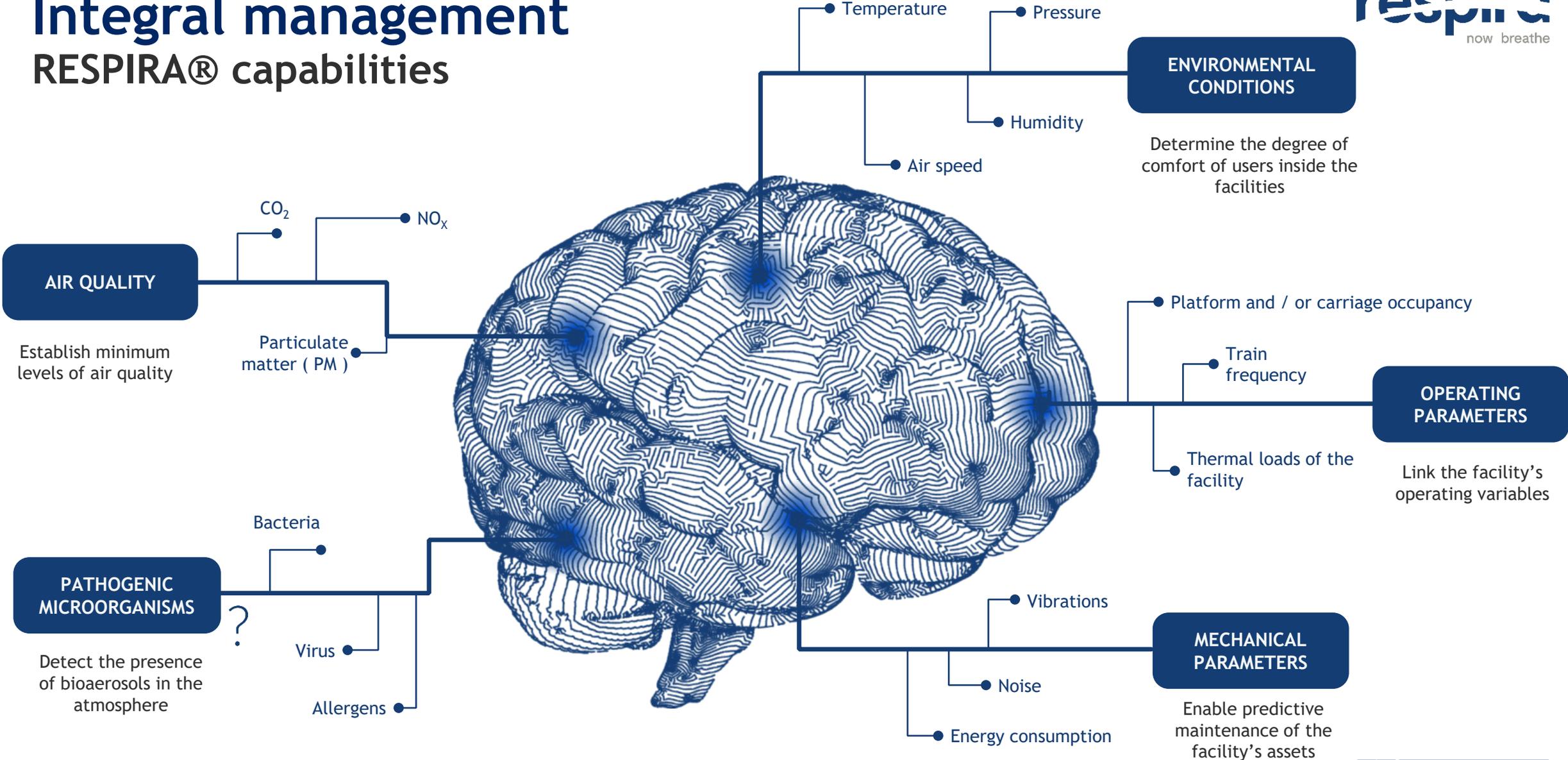
- 5 CONNECTED TRACKS
- 128 SUBWAY STATIONS
- 138 INDEPENDENT PLATFORMS
- 324 DISTRIBUTED VENTILATORS
- 91 KM IN LENGTH
- 94% PASSAGES OF BARCELONA
- > 1M TRIPS IN A DAY





■ **Integral Management**
Now breathe

Integral management RESPIRA® capabilities

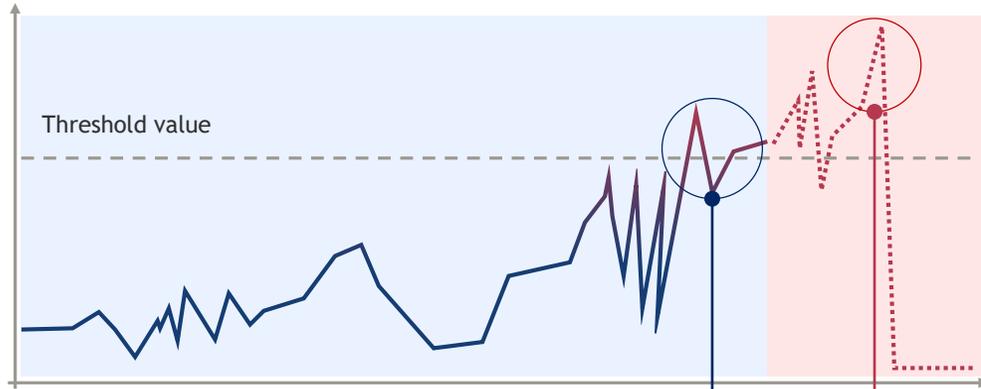


Integral management

Predictive capacity

PREDICTIVE ANALYTICS

Use of new and historic data to predict the future trend, activity and behavior.



PREDICTIVE ANALYTICS

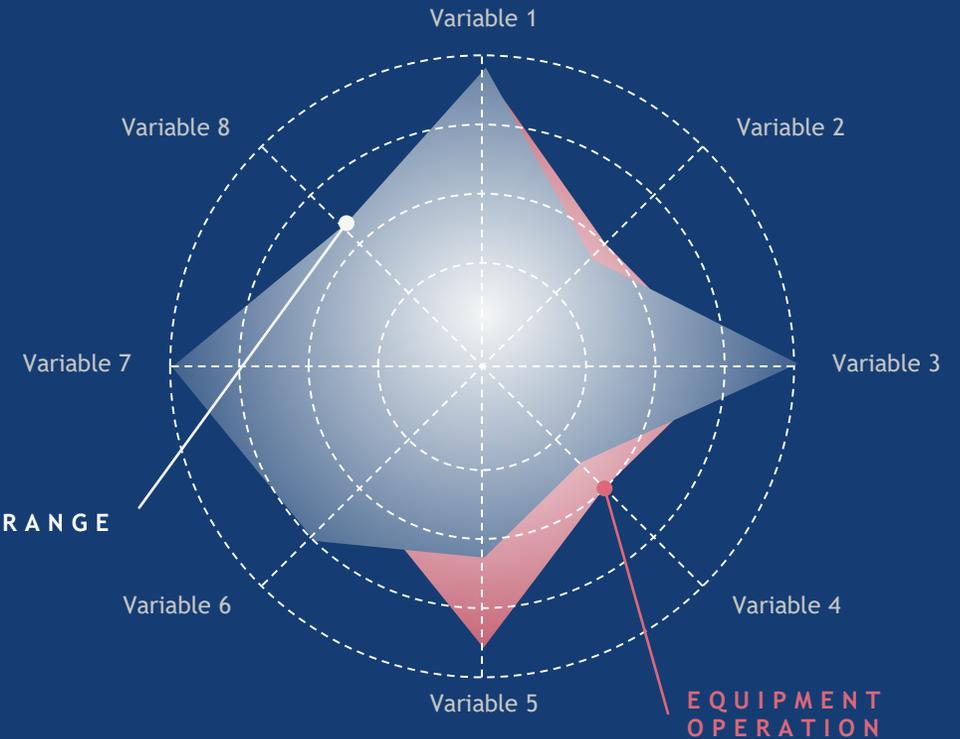
- Exceeded threshold
- Change of behavior pattern

PREDICTIVE MAINTENANCE

- Equipment failure
- Equipment deterioration

MAXIMUM OPERATING RANGE

OPERATING RANGE

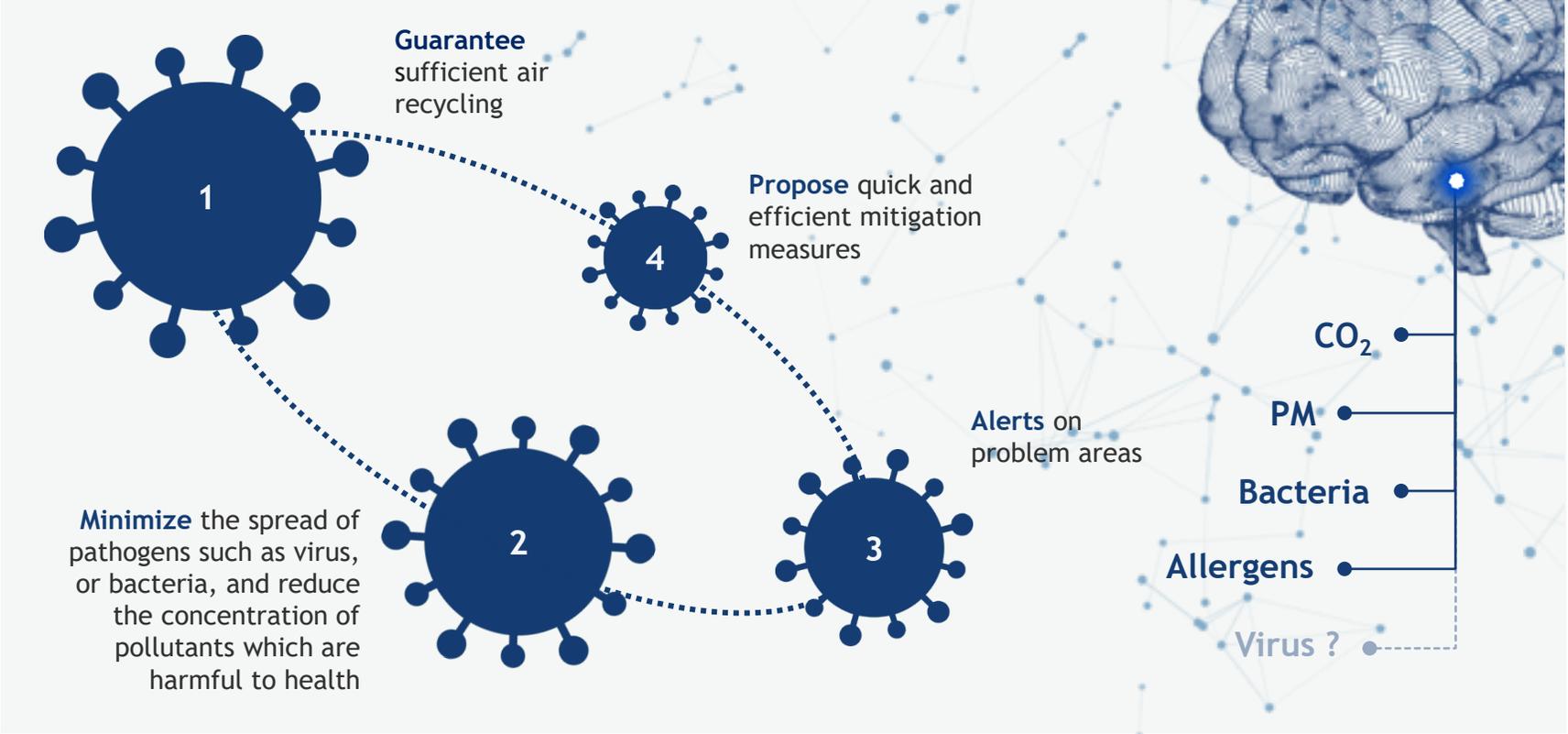


Establish maximum operating values of the equipment to evaluate performance

Integral management

Sanitary and Phytosanitary Capacities

How can RESPIRA® help to improve the air quality ?



NEW RECOMMENDATION GUIDES

Guía para la operación de sistemas de climatización de edificios durante la pandemia COVID-19

Lawrence J. Schoen | Marzo 2020

Instalaciones
Climatización
Gestión
Documentación
Documentos
Documentos destacados
Documentación técnica COVID-19

Atecyr elabora una guía de recomendaciones de operación y mantenimiento de los sistemas de climatización y ventilación en centros no sanitarios para la prevención del contagio por COVID-19

11/05/2020

La Asociación Técnica Española de Climatización y Refrigeración (Atecyr) ha elaborado una guía de recomendaciones de operación y mantenimiento de los sistemas de climatización y ventilación en centros no sanitarios para la prevención del contagio por COVID-19, dirigida a todo el sector de la climatización en España (ingenieros, arquitectos, fabricantes, instaladores, mantenedores, gestores energéticos, propietarios y la propia administración) y con la que se pretende concienciar de la necesidad de hacer cambios en el funcionamiento de las instalaciones de climatización que hagan edificios más seguros de cara a la posibilidad de contagio y permitan aplicar las soluciones existentes en función del sistema y el tipo de instalación.



■ The Product Why RESPIRA® ?



The Product

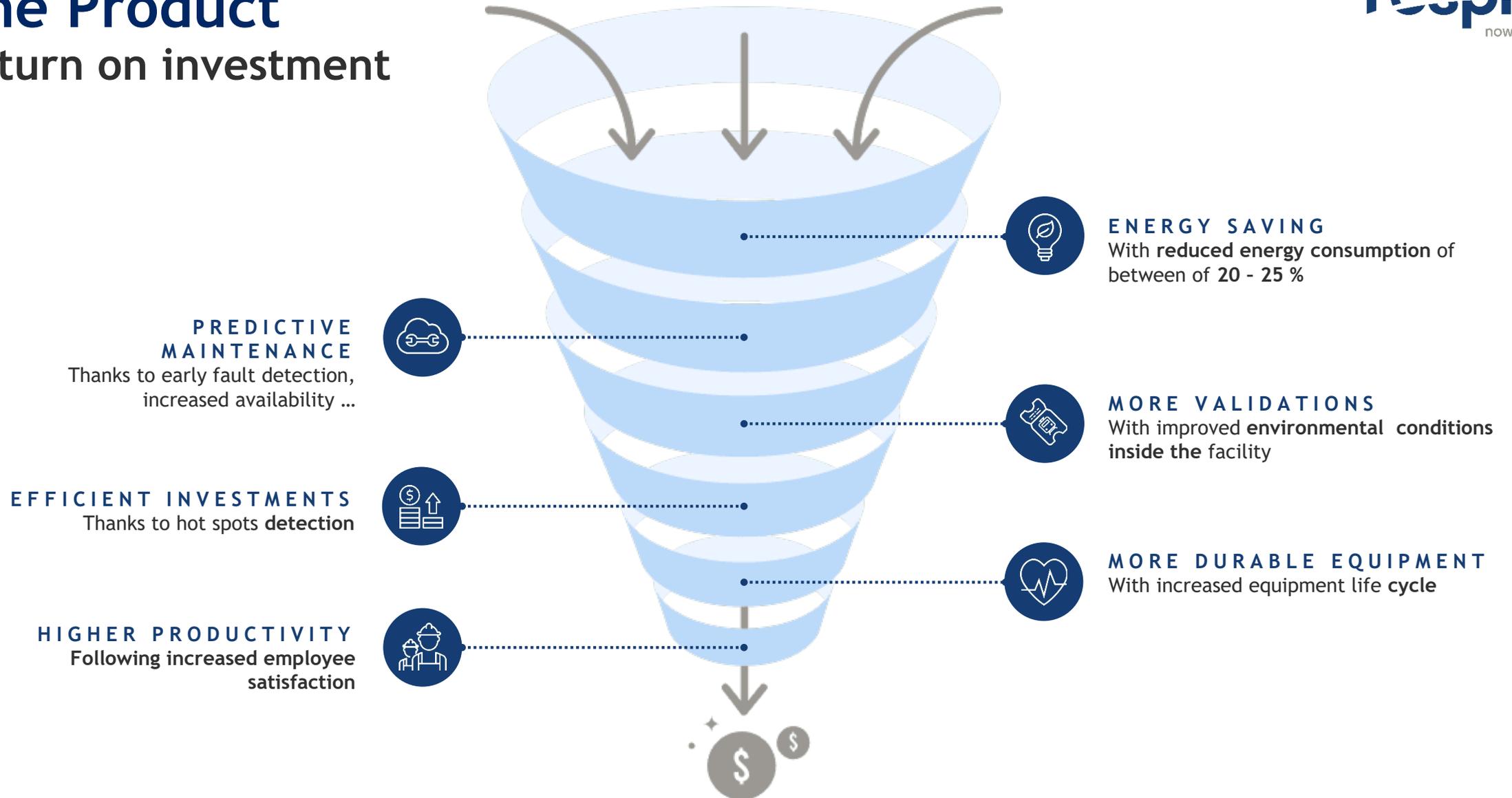
The formula

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The Product

Return on investment



The Product

RESPIRA® and the Sustainable Development Goals

RESPIRA® joins the UN Sustainable Development Goals (SDGs), with the objective to strengthen economic growth, promote social inclusion, fight climate change and protect the environment.

12

RESPONSIBLE PRODUCTION AND CONSUMPTION

Offer a product which respects the environment and favors **sustainable development**.

Minimize equipment operation hours, reduce equipment deterioration and the period of maintenance and / or replacement of the same.

9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Development of a **technologically advanced** product with branded **innovative capacity**



3

HEALTH & WELLNESS

Guaranteed improved user **comfort and health**

7

CLEAN AND AFFORDABLE ENERGY

Contributes to **reduced energy consumption** and **carbon footprint**

The Product

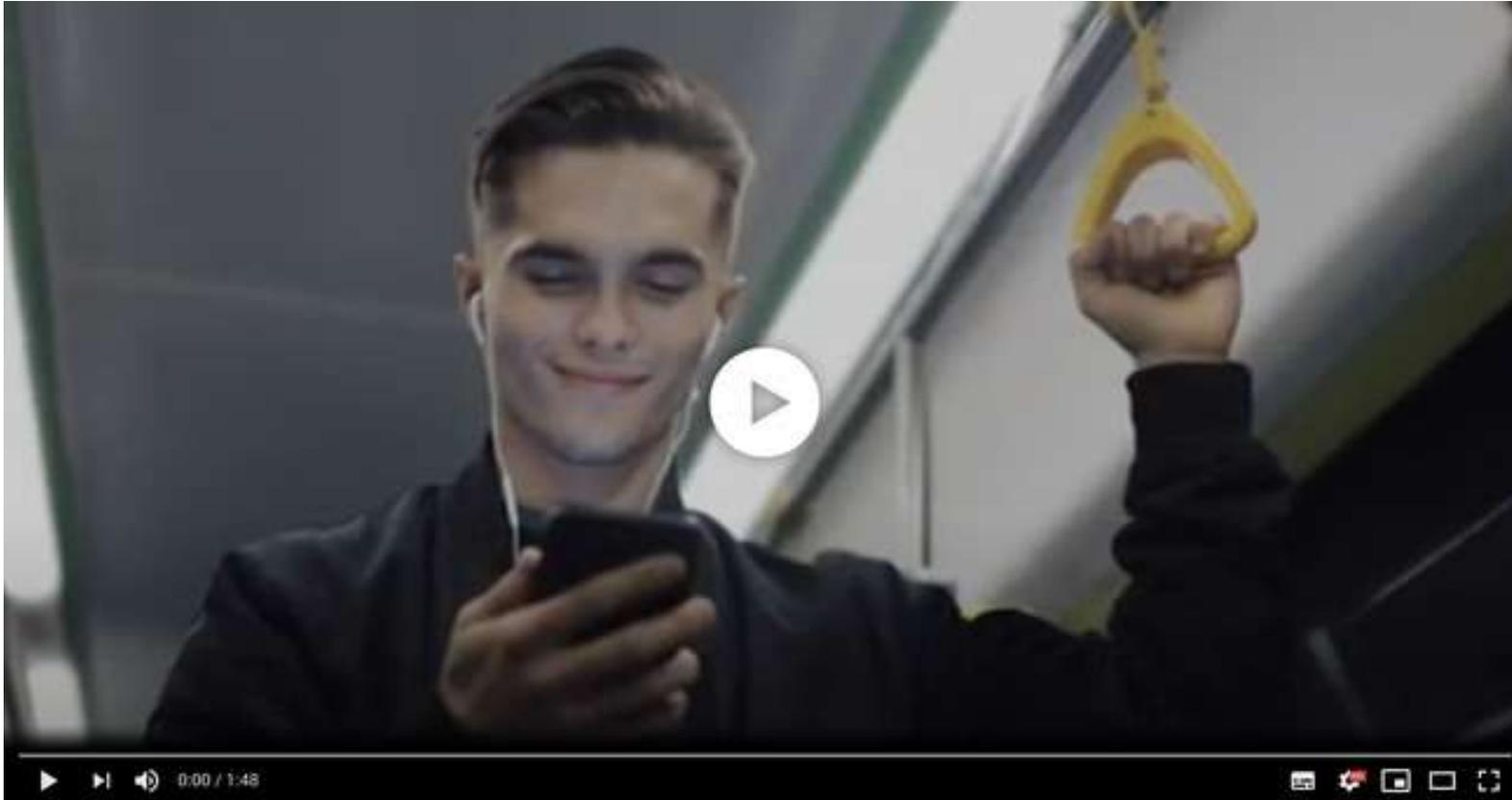
Future cities



The Product

Discover RESPIRA®

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The team

Behind any good work there is a team



 **GUILLEM PERIS**
Project Manager



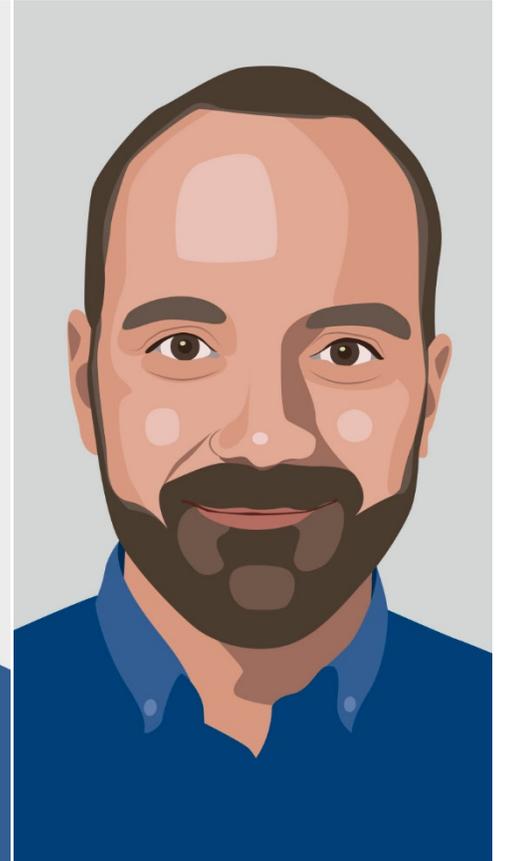
 **SILVIA FIGUEROLA**
BI Analyst



 **JORGE RODRÍGUEZ**
Data Engineer



 **FRAN GUERRERO**
Data Scientist



 **JAVIER MURILLO**
DevOps

THANK YOU

 www.infrastructure.sener

in www.linkedin.com/company/sener

You Tube www.youtube.com/user/senerengineering