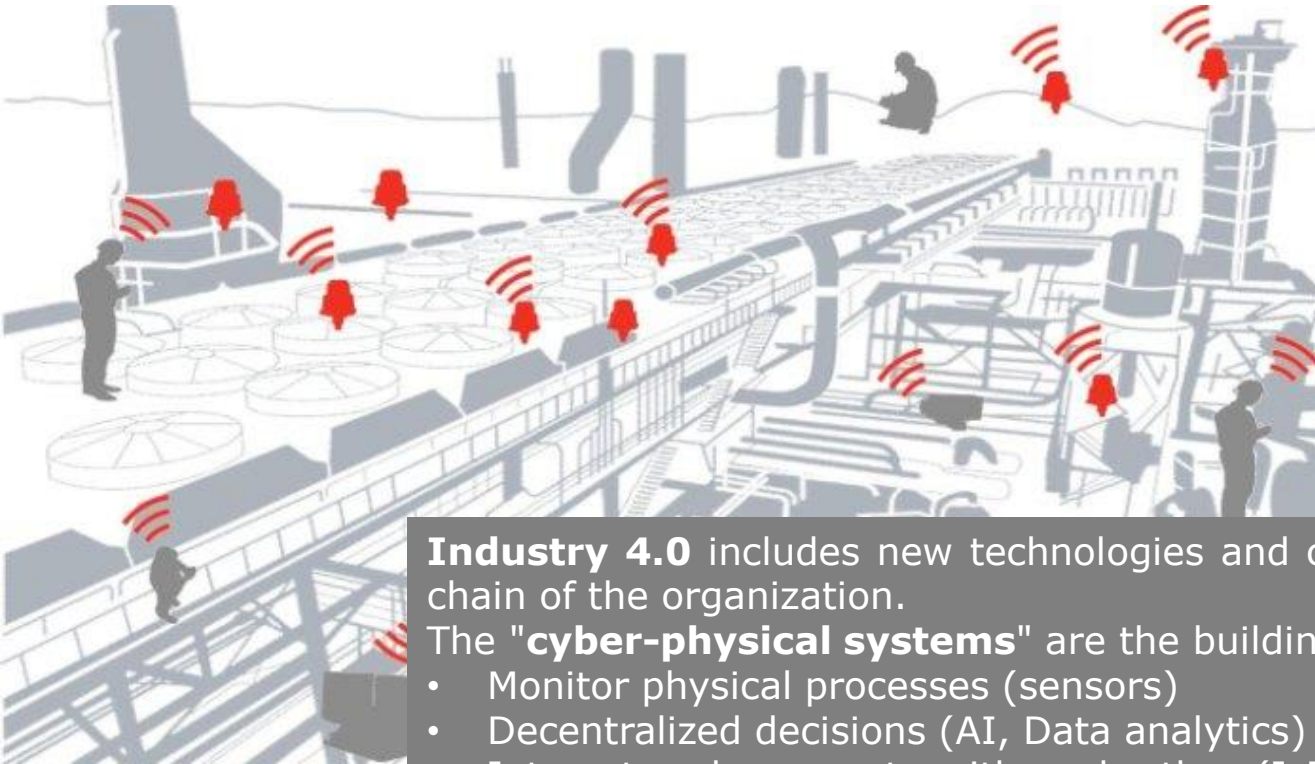




**Your bridge to
INDUSTRY 4.0**



Industry 4.0



Industry 4.0 includes new technologies and concepts that change the value chain of the organization.

The "**cyber-physical systems**" are the building blocks of I4.0:

- Monitor physical processes (sensors)
- Decentralized decisions (AI, Data analytics)
- Interact and cooperate with each other (IoT) and operators (Collaborative Robotics)
- Interact with other elements of the organization or external (cloud, etc.)

Industry 4.0



Eurecat and Industry 4.0

Differential value of Eurecat on Industry 4.0

KPIs in the Factory of the Future

Increased Productivity:

- Optimization of operations
- Quality increase: Near zero defects
- Training of personnel / Safety of operators

Reduction of operating costs:

- Optimization of energy consumption:
Intelligent management of resources
- Maintenance improvement: Predictive maintenance

Differential know how of Eurecat

In-depth knowledge of industrial processes (Pilot Plants)

+

Cyberphysical systems and IoT

+

High capacity in Big Data Analytics

+

Cybersecurity

Roadmap I4.0

SENSORS

WEARABLES

CYBER-
PHYSICAL
SYSTEMS

COLLABORATIVE
AND
AUTONOMOUS
ROBOTICS

ADDITIVE
MANUFACTURING

BIG DATA
ANALYTICS

INDOOR
POSITIONING

AUGMENTED
REALITY

CYBER-
SECURITY

Eurecat and Industry 4.0

OPERATIONS OPTIMIZATION

NEAR-ZERO-DEFECTS

INTELLIGENT RESOURCE MANAGEMENT

PREDICTIVE MAINTENANCE

WORKER OF THE FUTURE

INTELLIGENT PRODUCTS

Sensors / IoT

DSS

Data Analytics / Big Data / Cloud

Collaborative Robotics

Indoor positioning

Augmented Reality

- **Control and optimization of processes:** monitoring, data analysis, prognosis and intervention, through the development of advanced algorithms.
- Reduction of costs due to **detection of inefficiencies** in processes / systems.
- **Flexible, automated productive environments**, combining human capacity and collaborative robotics. Adaptable for different products.
- Development of technologies for the improvement of **machine-operator interaction**. AR interfaces.
- **Mobile autonomous robotics** for surveillance, inspection and manipulation. Automatic vehicle guidance.
- To exploit the **information coming from the platforms of interconnection supplier-client**.

SUCCESS CASE

CHALLENGE: Minimize fatigue and injuries of operators in repetitive parts handling processes.

SOLUTION: Industrial and collaborative mobile manipulator.



Multinational of the automotive sector

Eurecat and Industry 4.0

OPERATIONS
OPTIMIZATION

NEAR-ZERO-
DEFECTS

INTELLIGENT
RESOURCE
MANAGEMENT

PREDICTIVE
MAINTENANCE

WORKER OF THE
FUTURE

INTELLIGENT
PRODUCTS

Sensors / IoT

Cyber-physical
systems

Simulation

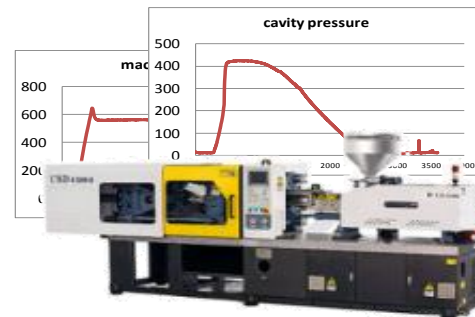
Data Analytics /
Big Data / Cloud

- Application of advanced artificial intelligence technologies, with self-learning capability, for **real-time prediction of defects in parts**.
- Standardization of **set up process by expert systems**, reduction of start-up time, consumption of raw material and energy.
- **Auto-tuning of machine parameters** to achieve total quality.
- **Artificial vision** systems.
- Acquisition of production data and **data analytics** for **product traceability**.

SUCCESS CASE

CHALLENGE: Minimization of defects in plastic injection parts and mould start-up time.

SOLUTION: Development of a CyberPhysical System (CPS) to monitor, control and optimize the process.



Tier1 Automotive Plastic Parts

Eurecat and Industry 4.0

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INTELLIGENT
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Sensors / IoT

Cyber-physical
systems

Simulation

Data Analytics /
Big Data Cloud

Cloud

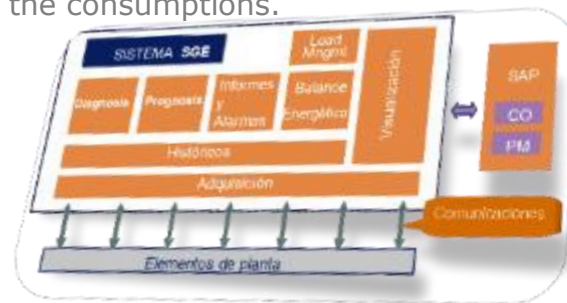
Intelligent modules and data analysis for:

- Multiobjective optimization (**water, electricity, cooling, heat**, etc.)
- Incorporation of external data (energy price, data from official bodies, etc.)
- Detection and reduction of locations where energy consumption is high, inefficient or inadequate.
- Detection of poor production management, machine shutdowns, obsolete and inefficient equipment.

SUCCESS CASE

CHALLENGE: Comprehensive control and management of energy costs in industry.

SOLUTION: Intelligent Energy Management System based on the Supervision, Diagnosis and Prognosis of the consumptions.



Multinational of the automotive sector

Eurecat and Industry 4.0

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FUTURE

INTELLIGENT
PRODUCTS

Sensors

IoT

Cloud

Data Analytics /
Big Data

Indoor
positioning

Augmented
Reality

- **Diagnosis of breakdowns in machinery and prediction of the lifespan**, by means of sensors in critical elements and techniques of artificial intelligence with self-learning capacity.
- **Optimization of routes** through Indoor Positioning.
- **Augmented reality** to support operators in maintenance tasks. Dynamic analysis of the state of the machine for optimization of preventive maintenance tasks.
 - Show parts of the machine simulating 3D depth.
 - Record the action performed (SAP).
 - Tracking of possible incidents, photographs, videos and relevant details.

SUCCESS CASE

CHALLENGE: Improvement of maintenance processes in industrial facilities.

SOLUTION: AR and VR for operator assistance. Algorithms for calculation of optimal routes and indoor positioning for guidance.



Multinational of the automotive sector

Eurecat and Industry 4.0

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IoT

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Big Data

Indoor
positioning

AR / VR

Wearables

- **Work Force Management** modules, automatic management of work orders of operators (wearables).
- Clothing for **monitoring the health** of workers exposed to situations of risk and stress.
- **Operator and asset positioning systems** and monitoring of environmental conditions to ensure the **safety** of workers.
- Development of **knowledge repositories** related to the productive process, useful for the execution of operations.
- **Training of workers** in I4.0 technologies

SUCCESS CASE

CHALLENGE: Training of operators in complex tasks.

SOLUTION: AR and VR for learning, simulation and evaluation of incidents in industrial environments. Content manager and evaluation test.



German Multinational - personal care sector

Eurecat and Industry 4.0

OPERATIONS
OPTIMIZATION

NEAR-ZERO-
DEFECTS

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RESOURCE
MANAGEMENT

PREDICTIVE
MAINTENANCE

WORKER OF THE
FUTURE

INTELLIGENT
PRODUCTS

- Design of products with sensors capable of **sending information** throughout their life.
- The **data** received in **real time** contributes to the decision making for the continuous improvement of the product and the experience of the user. They can also facilitate **product traceability** or enable authentication of the product.

Sensors

IoT

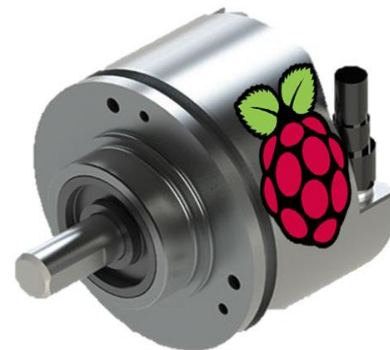
Cloud

Data Analytics /
Big Data

SUCCESS CASE

CHALLENGE: Update the encoder family.

SOLUTION: Provide the encoder with a communications port type USB and develop a new embedded SW and a control panel so that the component can be controlled and reconfigured in real time.



Eurecat and Industry 4.0

CYBER-SECURITY: The plant becomes a system connected to the outside world through the internet and increases the exposure to attacks. Cybersecurity becomes an essential factor in the connected industry.

- **Protection** of the **company's** IT infrastructure. Application of security-by-design, hardware security analysis, etc.
- **Plant security:** SCADA environments, critical infrastructures for production, etc.
 - Design of security solutions.
 - Solutions of authentication, digital identity and privacy.
 - Ethical hacking, intrusion test, analog security, etc.
- **Security in product:** Application of security-by-design, hardware security analysis, etc.

SUCCESS CASE

CHALLENGE: Check robustness against Denial of Service (DDoS) attacks on AGBAR infrastructure.

SOLUTION: "Simulation" of DDoS attack using Floodr.



Water supply company

Eurecat Strategy

Positioning

Eurecat actively participates with public and private entities to improve the implementation and good practices of I4.0:



Roadmap Industry 4.0

Objective

Development of a Technological ROADMAP for the implementation, in an orderly and strategic way, of Industry 4.0 solutions in the company.

Month 1

Month 3



Technological surveillance I4.0

Diagnostics

Roadmap I4.0

Study / map of existing I4.0 technologies. Successful cases of competitors.

Technological capabilities of the company and identification of opportunities.

Plan of technological actions I4.0 (identification of solutions, temporary planning, training, etc.)

eurecat

We are ready to bring you there

www.eurecat.org

