Industry4.0 – All Inclusive
«IoT, CPS e le nuove frontiere della intelligenza artificiale»

Modulo 6
IoT, CPS & AI: esempi ed applicazioni

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(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche

Everyware IoT

Business Applications

- Connectivity / Message Routing
- Device Registry and Management
- Data Management and Storage
- Event Management
- Application Enablement

IoT Cloud Platform

Kapua

- Communications/messaging
- Data pre-processing
- Real-time data analytics
- Real-time actions/rules
- Application Container
- Remote management

IoT Gateway
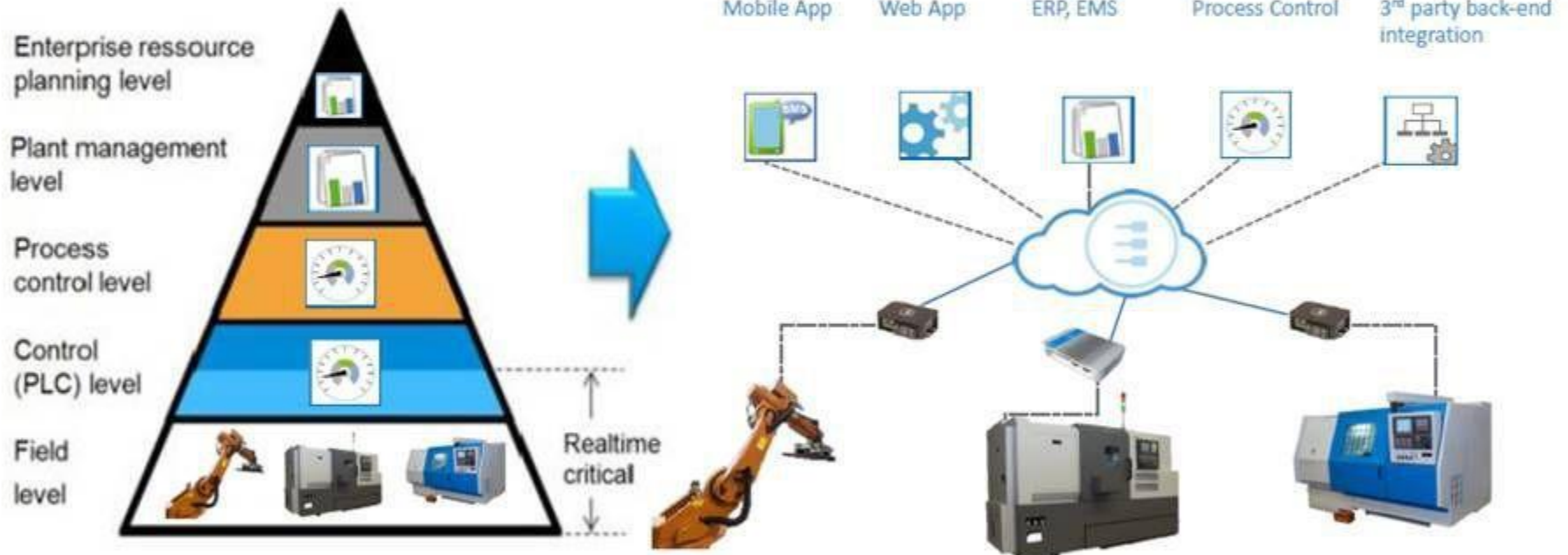
ESF

kura

- Communications/messaging
- Data acquisition
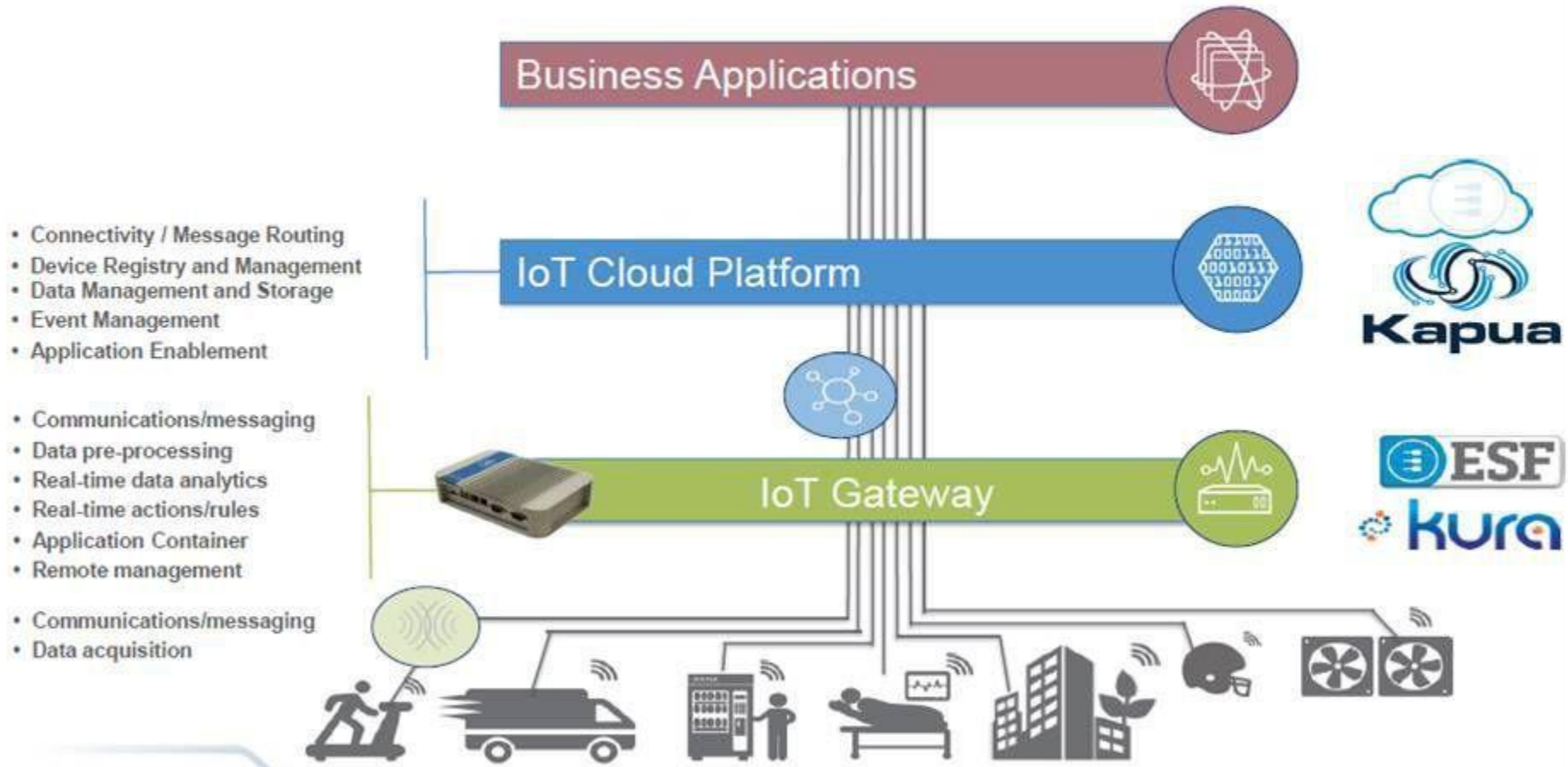
(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche
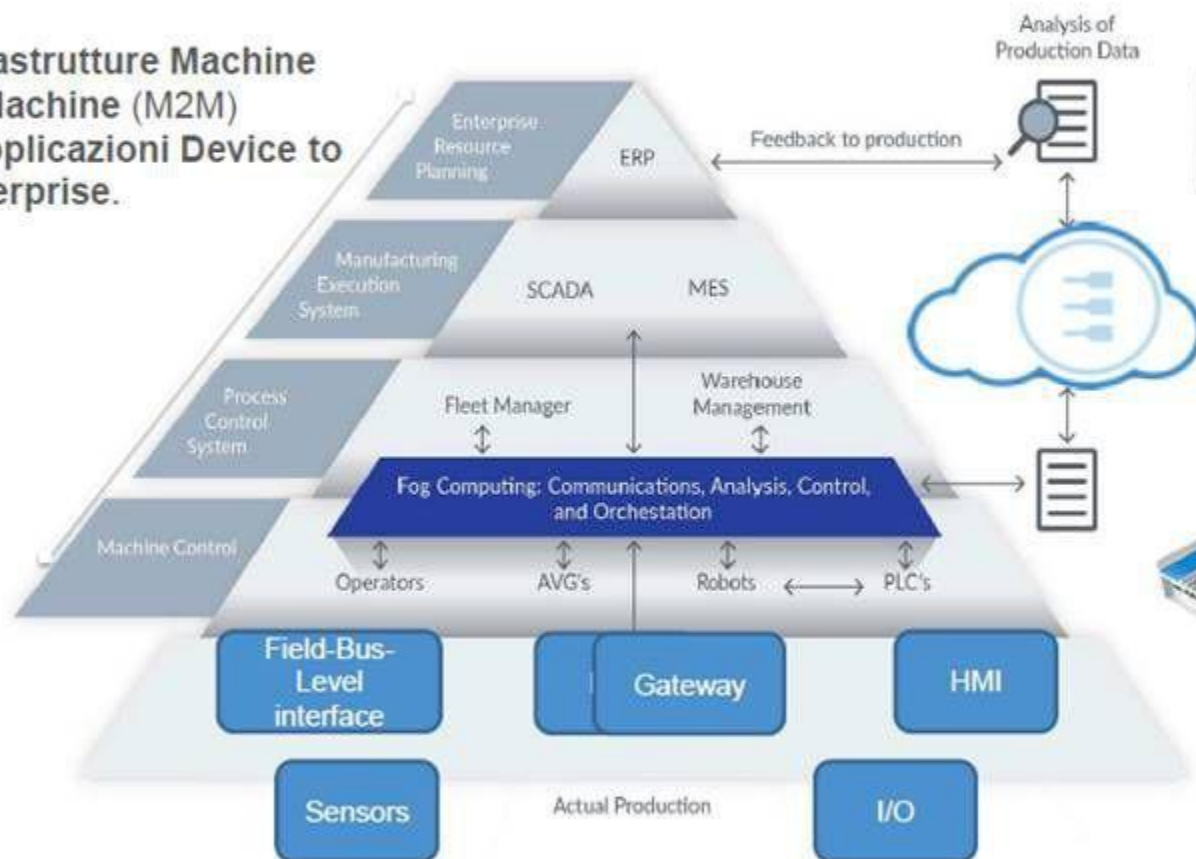

The Data Lake: the dawn of Industry 4.0

IIoT is instrumental to the generation of the Data Lake

(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche

Exor + Eurotech x Industrial IoT

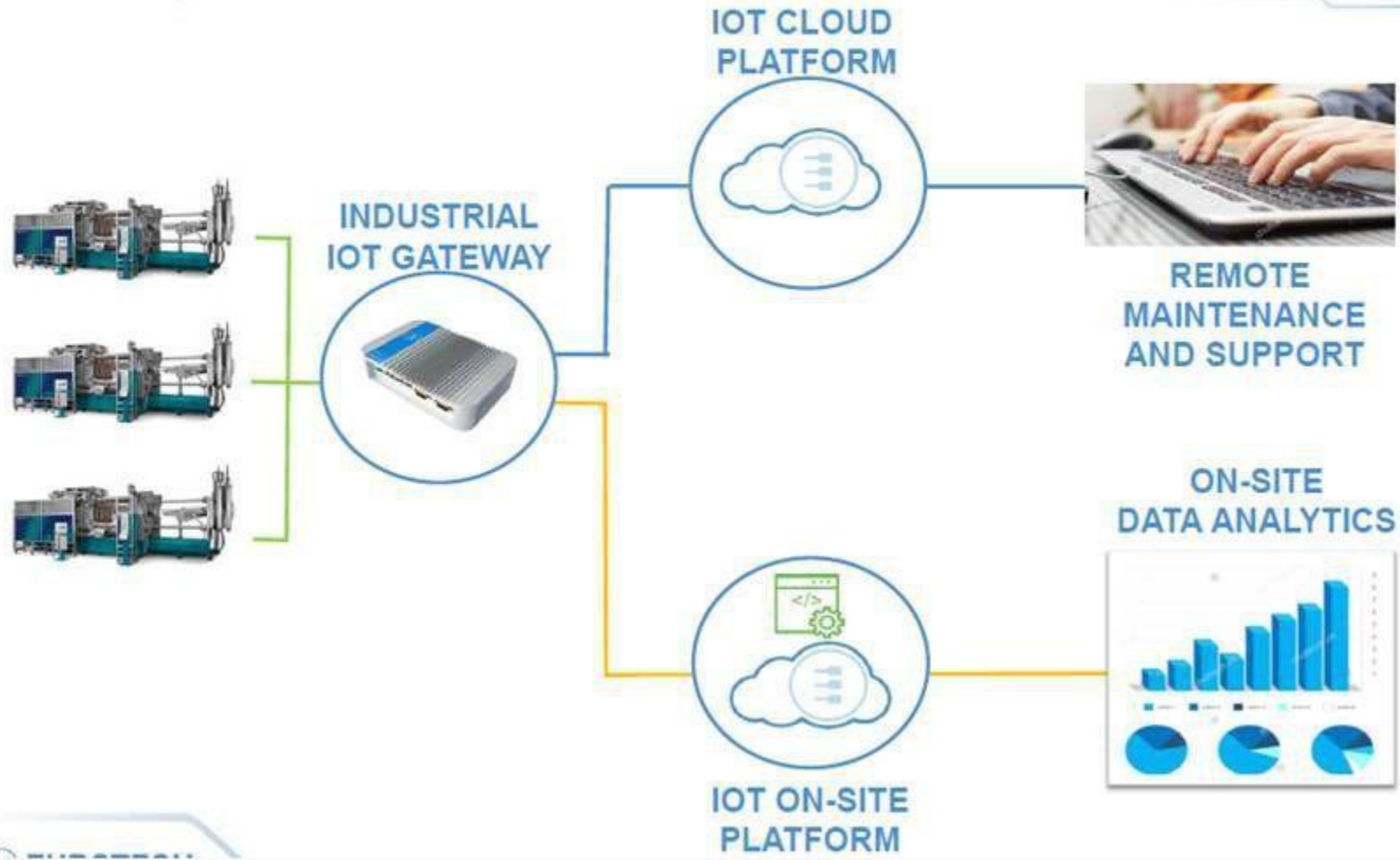**Infrastrutture Machine to Machine** (M2M) o **applicazioni Device to Enterprise**.

Analysis of Production Data

Feedback to production

Dashboard programming

EXOR

EXOR

Enterprise Resource Planning — ERP

Manufacturing Execution System — SCADA — MES

Process Control System — Fleet Manager — Warehouse Management

Fog Computing: Communications, Analysis, Control, and Orchestation

Machine Control — Operators — AVG's — Robots — PLC's

Field-Bus-Level interface — Gateway — HMI

Sensors — Actual Production — I/O

(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche

Industry 4.0 and Retrofit

IOT CLOUD PLATFORM

INDUSTRIAL IOT GATEWAY

REMOTE MAINTENANCE AND SUPPORT

ON-SITE DATA ANALYTICS

IOT ON-SITE PLATFORM

(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche

Connected Products

BOILER WITH SENSYS

GATEWAY

IOT APPLICATION
IOT PLATFORM

CONSUMER

SERVICE CENTER
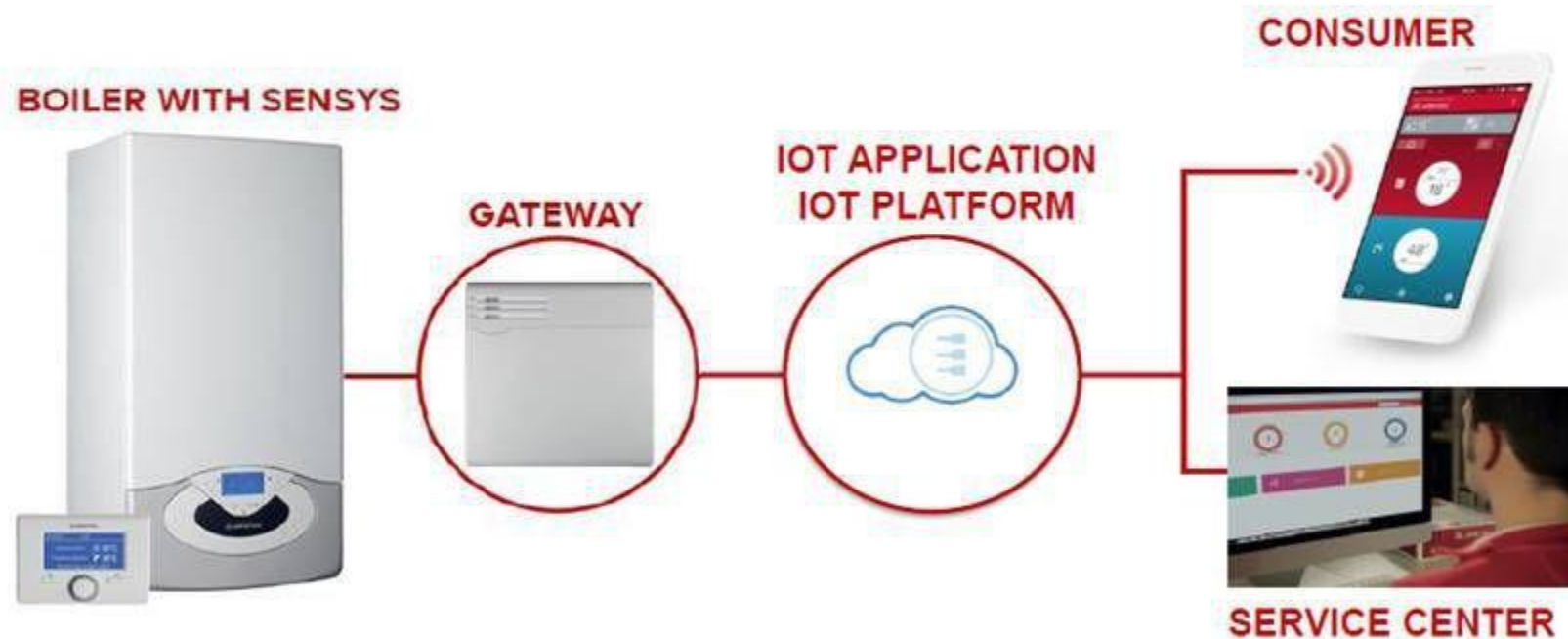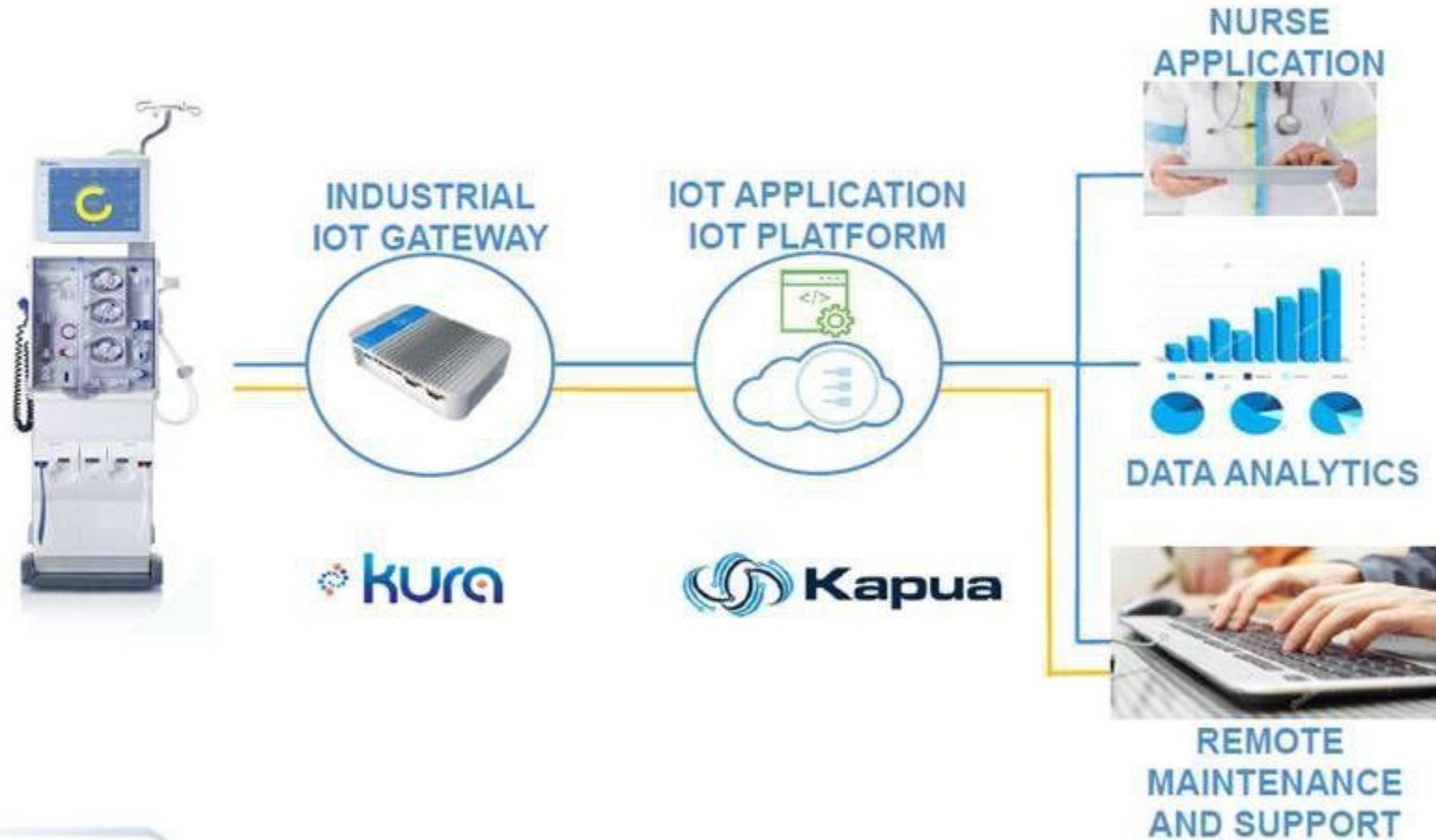
(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)

Alcune esperienze pratiche

Remote/Predictive Maintenance

INDUSTRIAL IOT GATEWAY

IOT APPLICATION IOT PLATFORM

NURSE APPLICATION

DATA ANALYTICS

REMOTE MAINTENANCE AND SUPPORT

kura

Kapua

(Fonte: Ing. Roberto Siagri, Quadrato della Radio, 2017)
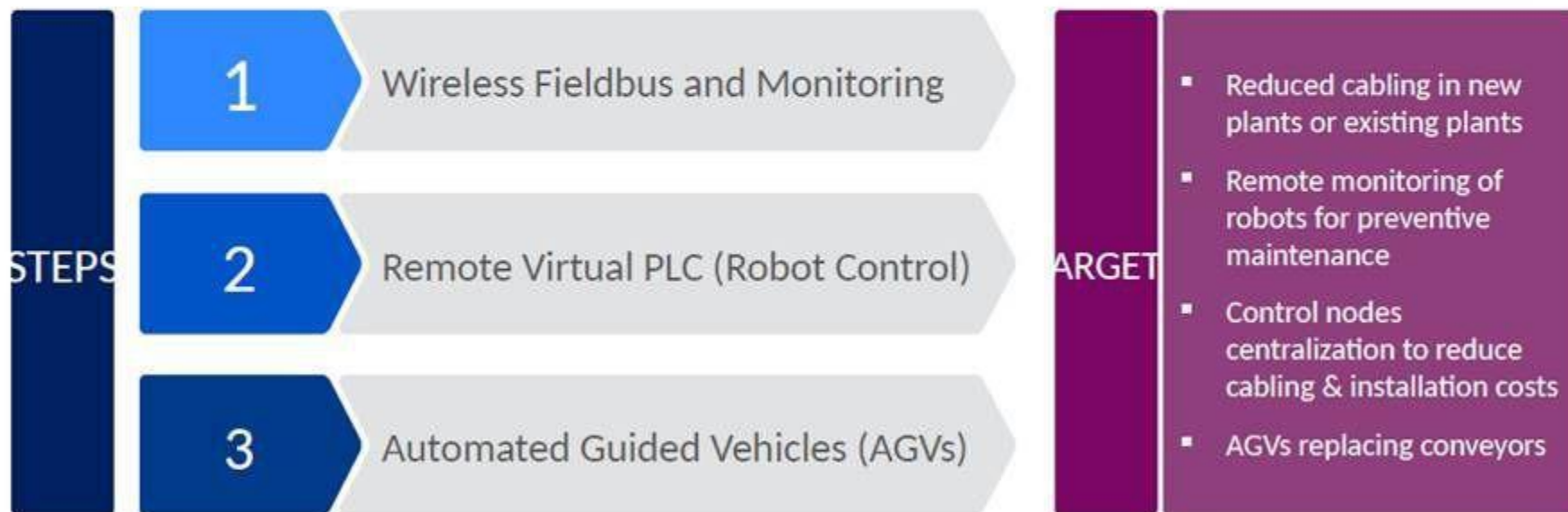
Alcune esperienze pratiche

IoT solutions
for Industrial automation

The final scope of the Ericsson-Comau project is to enable a secure and reliable **wireless network** for monitoring and control purposes. Sensors data from robots and plant will be processed in **cloud in** real time, also applying big data **analytics** functionalities to provide feedback to the customers for preventive maintenance.

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)

Alcune esperienze pratiche

IoT solutions for Industrial automation

STEPS

1. Wireless Fieldbus and Monitoring
2. Remote Virtual PLC (Robot Control)
3. Automated Guided Vehicles (AGVs)

TARGET

- Reduced cabling in new plants or existing plants
- Remote monitoring of robots for preventive maintenance
- Control nodes centralization to reduce cabling & installation costs
- AGVs replacing conveyors

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)

1 Wired connectivity replacement

Ericsson Indoor Radio Cell

Legacy wired connectivity between sensors, controllers (PLCs) and actuators will be replaced by 5G.
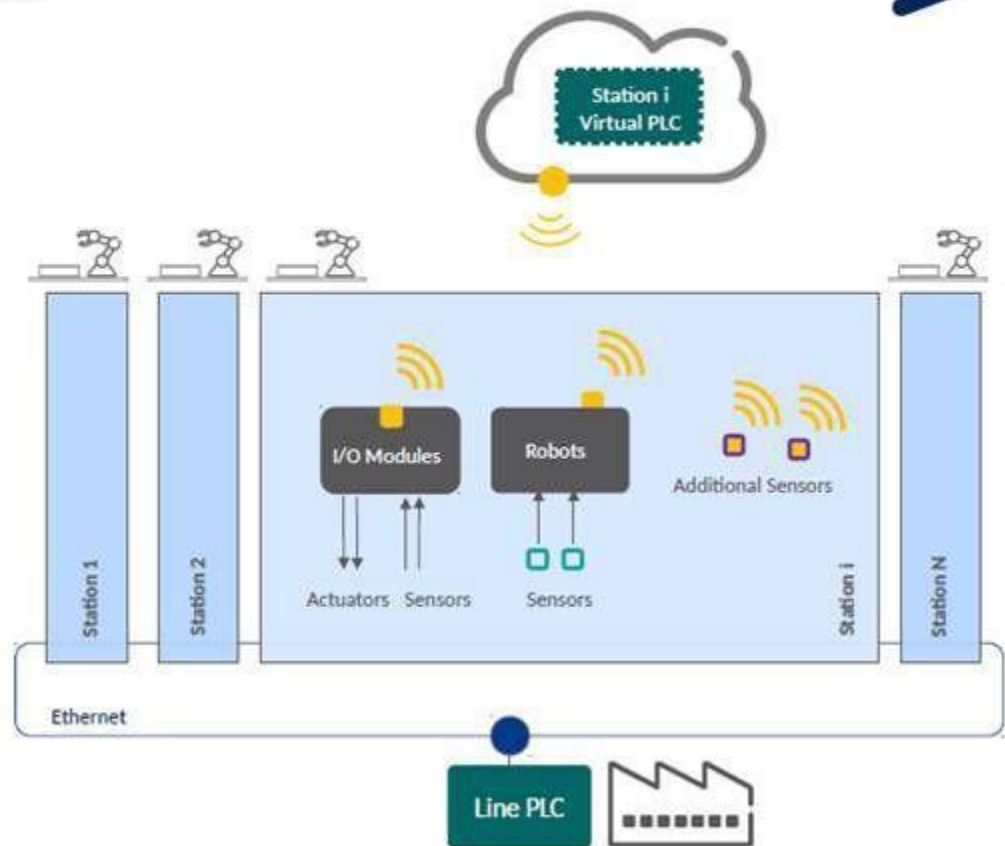
Camera

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)

Alcune esperienze pratiche
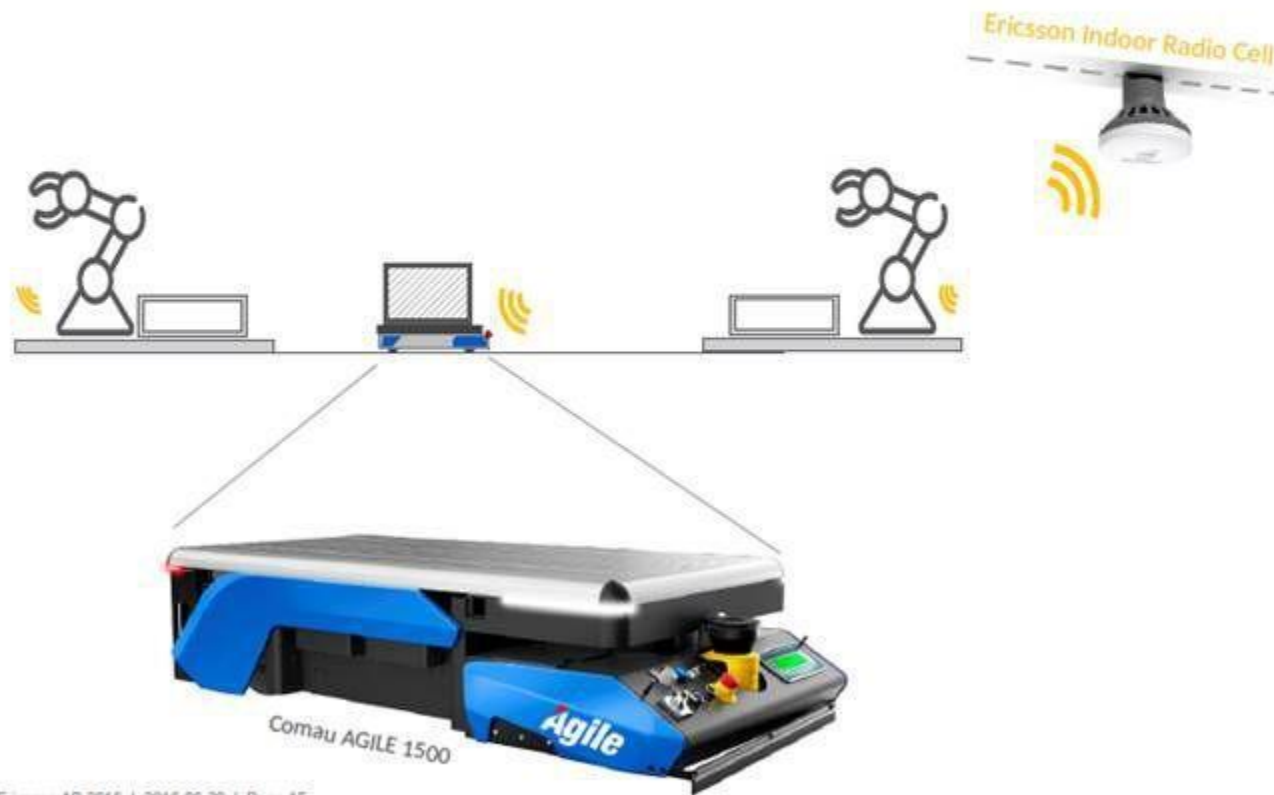
2 Remote Virtual Control (PLC)

Control logic over wireless and deployed on a cloud-platform:

- Easier implementation of new control features
- No new PLC hardware is needed when new actuators are deployed
- Deployment of different level of control functions on the same platform: factory, cell, actuator level
- Cooperative device control is possible

Station i
Virtual PLC

Station 1
Station 2
I/O Modules
Robots
Additional Sensors
Actuators Sensors
Sensors
Station i
Station N

Ethernet

Line PLC

PLC = Programmable Logic Controller

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)

Alcune esperienze pratiche

3 Automated guided vehicles

Ericsson Indoor Radio Cell

Comau AGILE 1500

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Autonomous vehicles are one of the key tools meeting the Factory of the Future's needs, such as growing demand of flexibility, re-configurability and minimal use of resources in production systems.

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)

Alcune esperienze pratiche

e.DO
Educational robotics

Comau e.DO is a unique, modular, open-source, Industry 4.0-enabled, "build-it-yourself" robot kit created for anyone who wants to explore or expand the world of robotics.

As an open-source project, the hardware and software structure is designed to encourage application sharing and expansion via the future community and program new coding directly into the robot itself.

(Fonte: Ing. Roberto Sabella, Quadrato della Radio, 2017)