

Advanced Digital Transformation for Cities, Manufacturing and Infrastructures

Panagiotis Demestichas
WINGS ICT Solutions,
University of Piraeus

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Fiber & 5G Highways: DigitAll Greece!
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- Turning point: Attention is needed
 - ▣ Digital Transformation is **essential**, yet the term is also **overused**
 - ▣ Sample issues: fragmented solutions, priority setting, simplistic or overly complex cases

- Big picture: tremendous benefits for **enterprises** and **organizations**, e.g.,
 - ▣ Quick, reliable data acquisition (“Sense”)
 - ▣ Data analysis (“Analyze”)
 - ▣ Timely / proactive actions (“Respond”)
 - Customer experience / journey optimization, new revenue generation, cost reductions, and more

- Therefore: need for careful selection of **objectives** and **approaches**
 - ▣ Address “grand” challenges, however, also focus on **most needed** areas / components of these challenges
 - ▣ Grand challenges in our focus: (a) **Cities** (“urbanization”), (b) **Manufacturing** (re-industrialize Europe) (c) **Energy** (sovereignty) and infrastructures
 - ▣ Key questions: (a) Which are the vital areas for these challenges? (b) Which are the **key** requirements per component?

Challenges



Smart city applications & **measurable** impact

- Important initiatives already;
- **Impact** assessment is needed
- “Liveability” model
 - ▣ Report2021, Report2019, Report2017
- Determined by various factors like:
 - ▣ Stability, Security, Safety
 - ▣ Healthcare
 - ▣ Culture & Environment, Education
 - ▣ Infrastructure
 - Transportation, Water, Energy, Telco, Buildings, etc.

Manufacturing / Energy Infrastructures

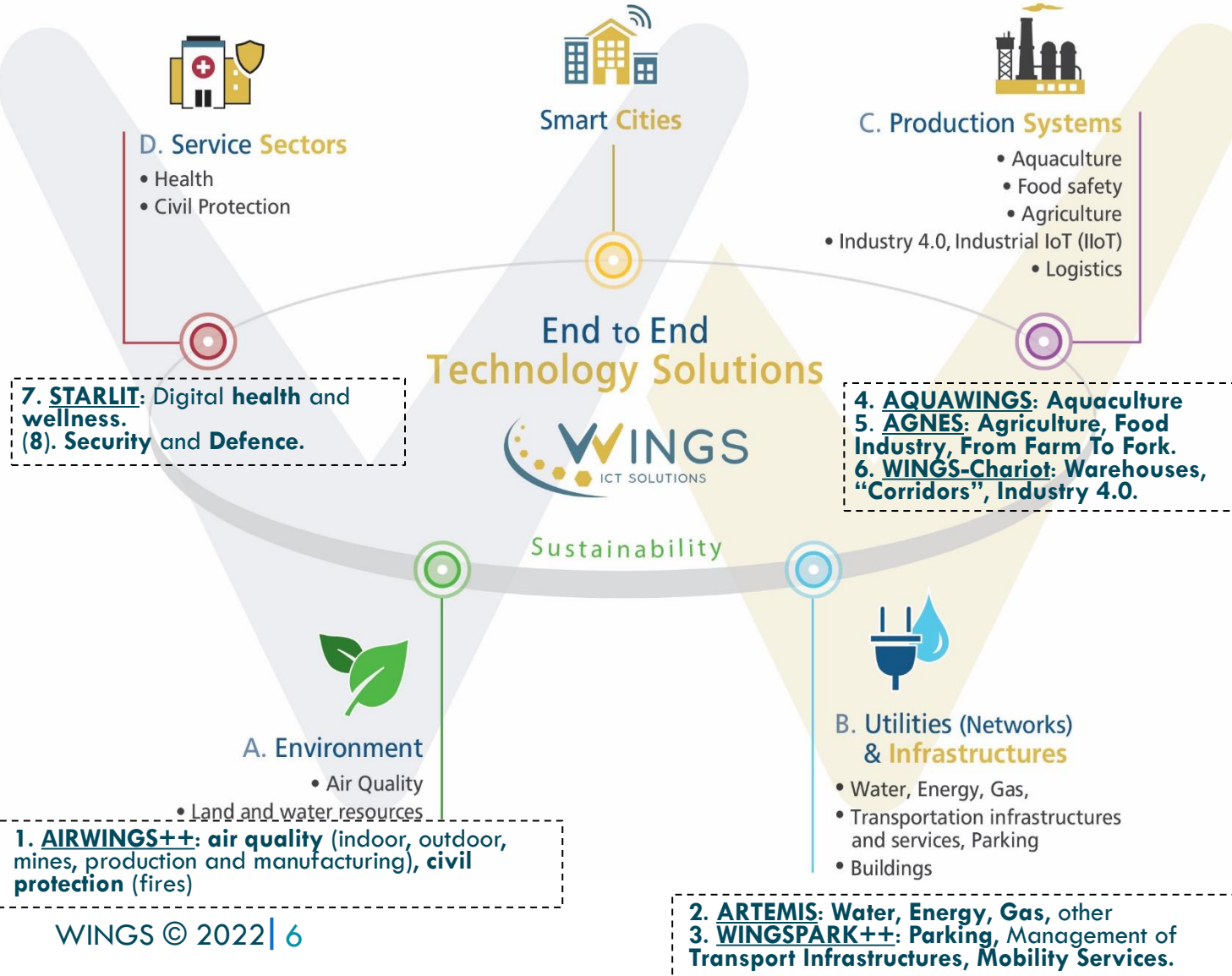
- Re-industrialize Europe
 - ▣ **Made in Europe** initiative of the EU, **strong push in US**
 - ▣ Important for Greece (e.g., Food, Construction (cement, etc.), Pharmaceutical products, Machines, Ships, ...)
 - ▣ **Sustainability, Resilience, Worker Safety / Wellness**, Automation and Intelligence
- Energy safety
 - ▣ Sovereignty
 - ▣ “Greening”

A relevant SME: “WINGS ICT Solutions”

LEVERAGE ON TECHNOLOGY EXPERTISE, TO TRANSFORM VERTICALS

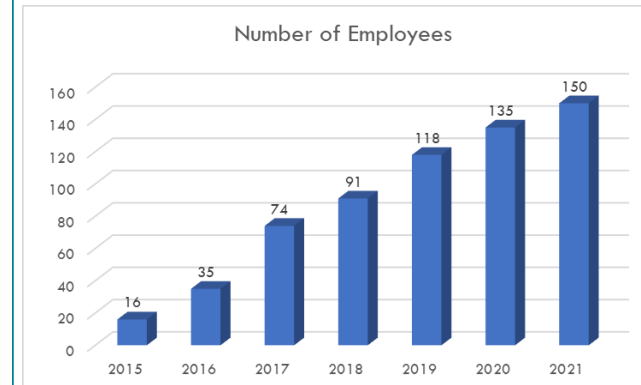
- Digital Solutions and Transformations for **Vertical** Sectors
- **Environment, Utilities & Infrastructure, Production & Manufacturing, Service** sectors
- **Technology** expertise: **IoT** , **5G** (edge/cloud, AI), **AI**, Visualization (**XR**)
- Sustainability (environment, society, economy), Smart Cities, Industry 4.0

WINGS ICT Solutions: Achievements, Status

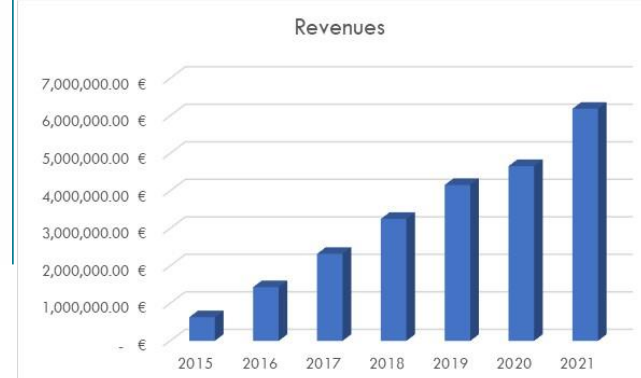


Products: 4 areas,

- 7 main products,
- 2 spin-outs,
- 1 product underway,
- 1 horizontal platform (diagnostics/orchestration for verticals)

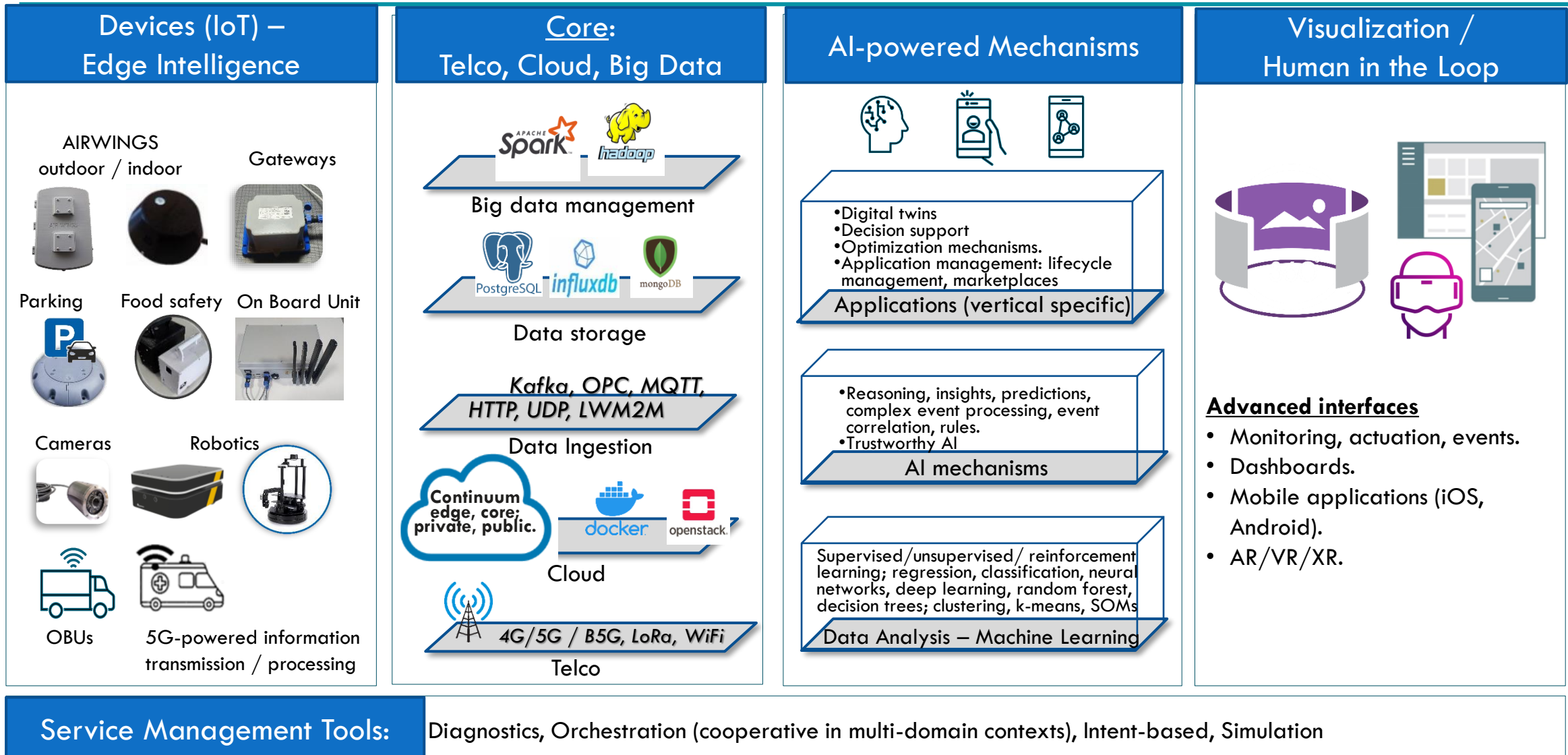


- Software and Hardware development
- Solution architects
- Project managers
- Product management
- Business development



- YoY Revenue Growth

Solution Architecture



Selected Solutions

AIRWINGS++: Overview



Outdoors

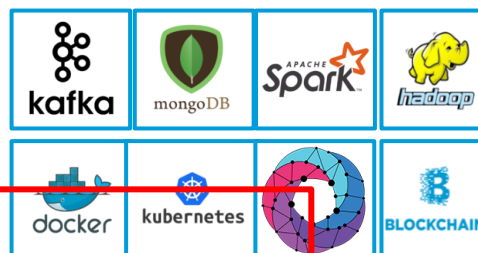
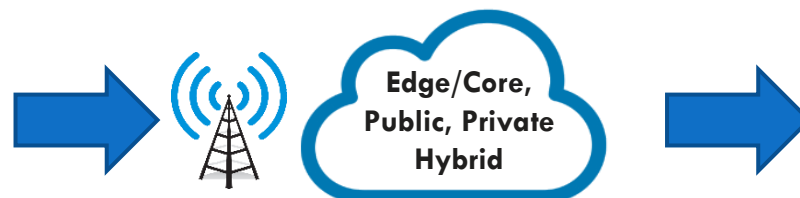
(O₃, CO, SO₂, NO, NO₂, PM1, PM2.5, PM10, Noise, Temperature, Pressure and Humidity)



Indoors

(CO₂, CO, VOC, O₃, NO₂, PM1, PM2.5, PM10)

5G (B5G), 4G, NB-IoT, GPRS, Cat-M, LoRa



CAPABILITIES

- ✓ **Air Quality:** monitoring indoor, outdoor, industrial contexts, production (livestock / farming).
 - ✓ Computation of Air Quality Index (AQI).
 - ✓ Parameter value predictions; Correlation of values.
 - ✓ Notifications and alerts; Health / Wellness indications.
 - ✓ Agriculture: support through insights on air, weather, solar radiation aspects.
- ✓ **Security, safety:** early warnings on fires; in conjunction with cameras and related AI means.

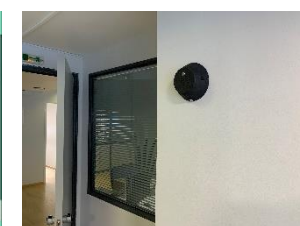
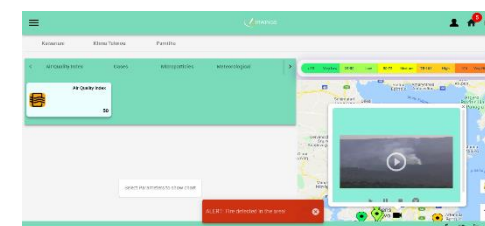
Extensions

Weather Stations

Solar radiation

Cameras (fires)

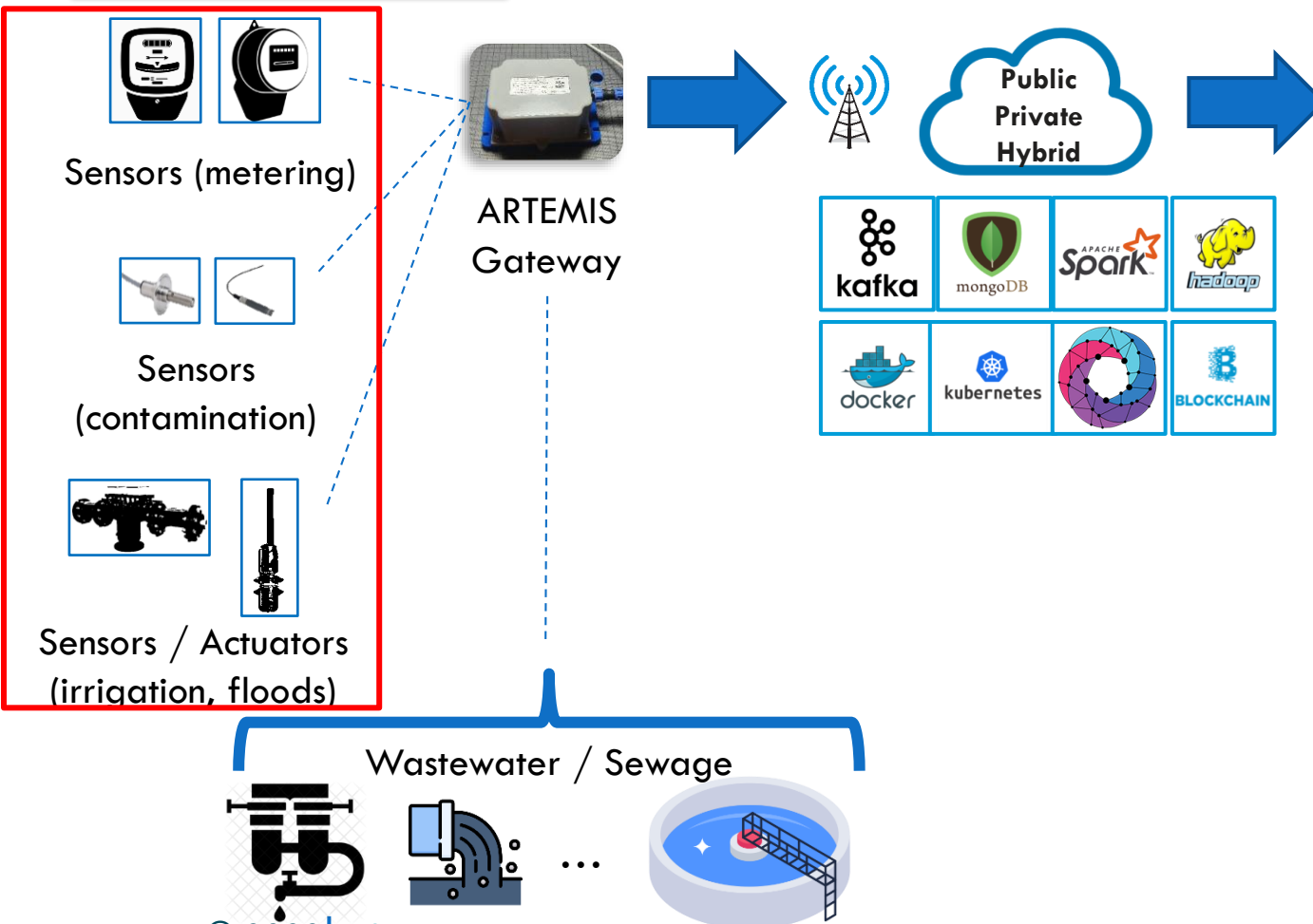
EMF (Electromagnetic field)
Telco / Mobility information



ARTEMIS-Water: Role Overview

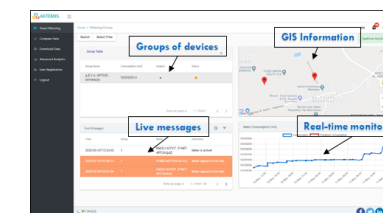
Pulses, Wireless/Wired
M-Bus, RS232, RS485,
serial, analogs, SDI12

5G (B5G), 4G, NB-IoT, GPRS, Cat-M, LoRa



CAPABILITIES

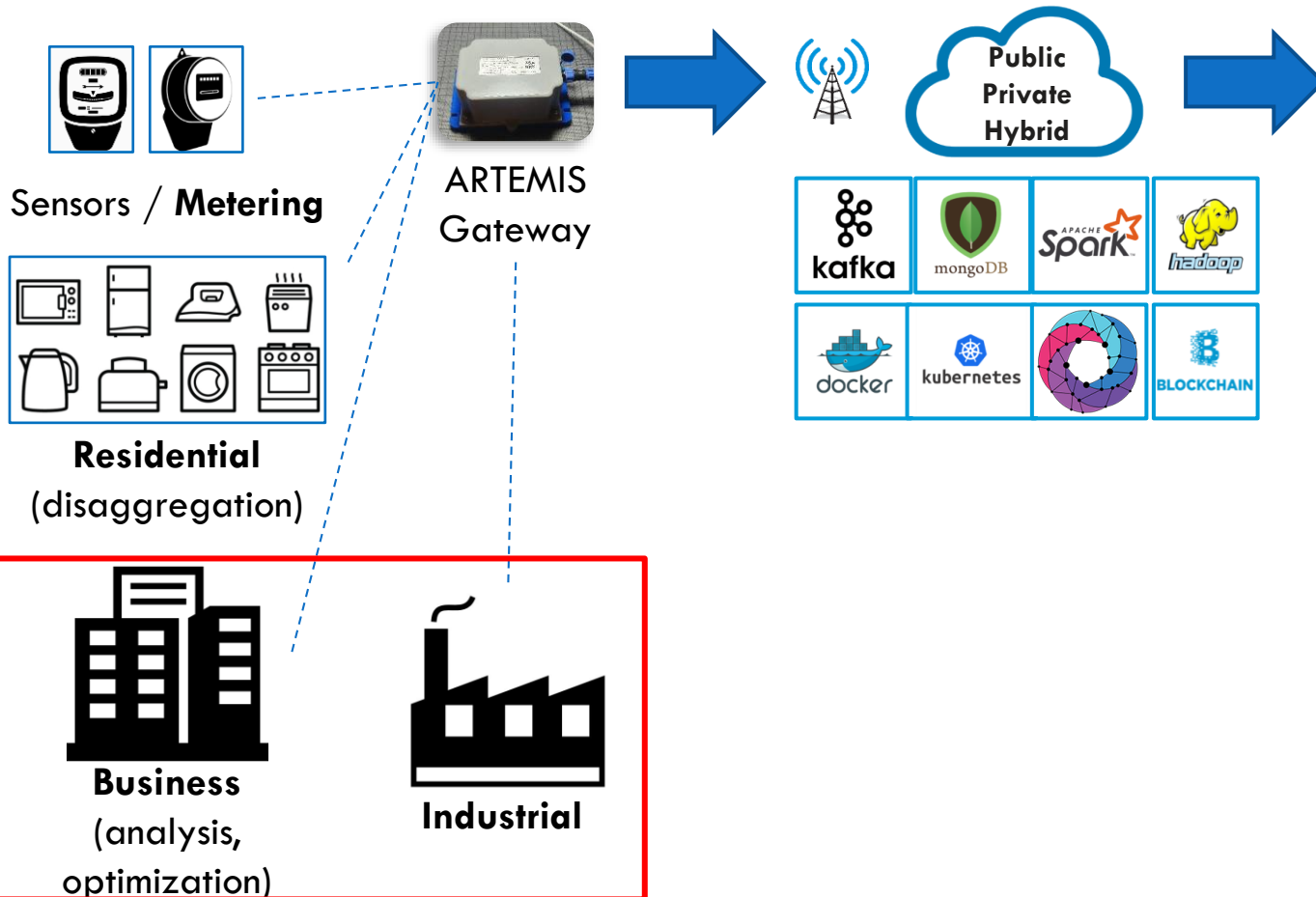
- ✓ **Metering (accounting):** Real-time **monitoring**, **prediction** of demand and of supply capabilities.
- ✓ **Faults:** *faulty meters*, network elements, *leakages*, *flood* predictions.
- ✓ **Performance:** assessment w.r.t. IWA indexes, **revenue** water maximization, **irrigation** optimization, **quality** of water, **wastewater / sewage** treatment.
- ✓ **Security:** physical installation, cybersecurity aspects
- ✓ **Configuration:** **actuators**, irrigation, etc.
- ✓ **Digital twins (diTTo)** for water infrastructure



ARTEMIS-Energy: Role Overview

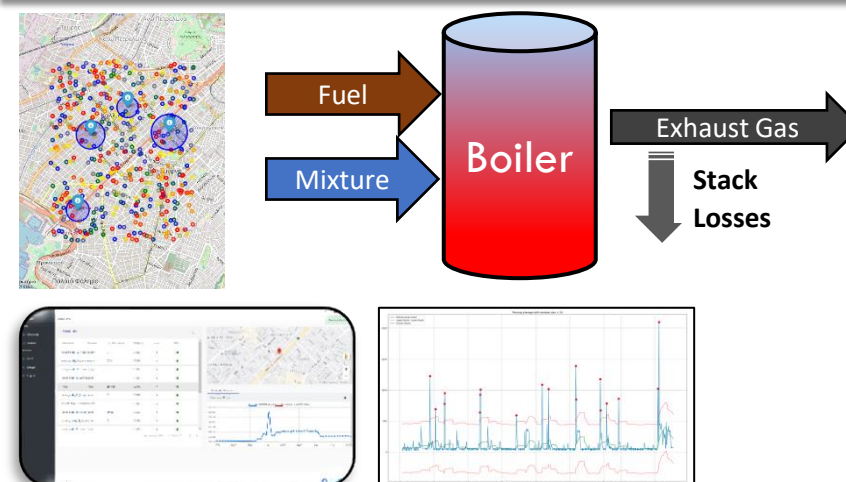
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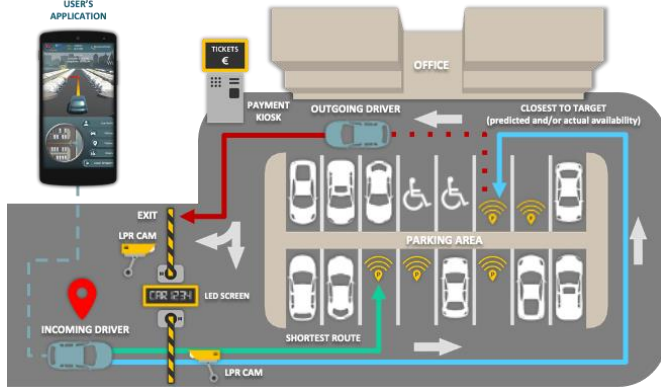
CAPABILITIES

- ✓ Metering (**accounting**): Energy *monitoring*, forecasting of demand and of supply capabilities.
- ✓ **Faults**: faulty *meters*, *outage*.
- ✓ **Performance**:
 - ✓ Optimization of energy use in *buildings*;
 - ✓ Planning of RES deployment in *cities*;
 - ✓ **Factory** processes optimization.
- ✓ **Security**: *power thefts*.
- ✓ **Configuration**: actuation actions.
- ✓ Management of energy production sites (in roadmap)



WINGSPARK++

PARKING

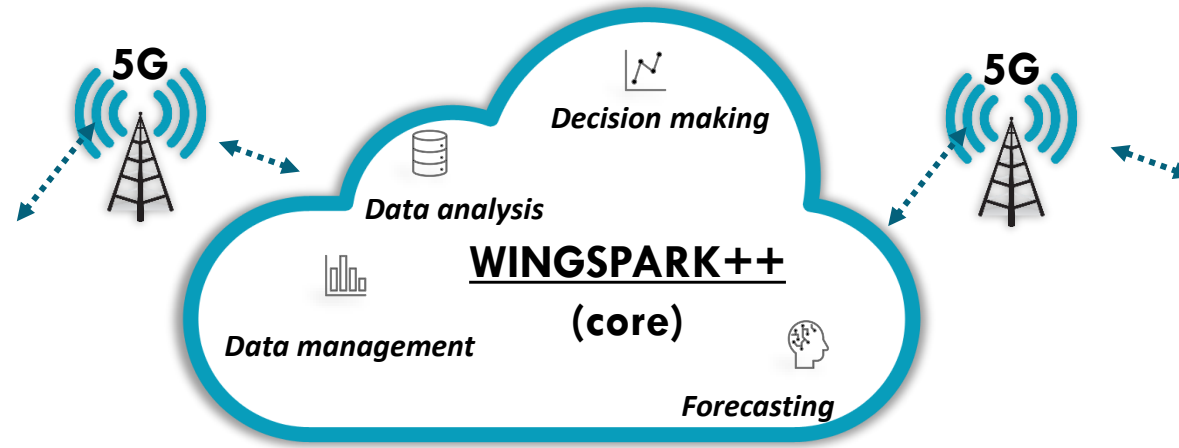


Monitoring. Availability / Utilisation

Decisions. Scheduling e.g., booking charging stations, parking spots, etc.

Policies. From stakeholders

Instructions. To drivers (incl. AR-powered)



ROADS, BRIDGES

Monitoring. Assess structural health,

Traffic flows.

Insights/Decisions. Early warning, predictive maintenance, etc.

AIRPORTS, (PORTS)



Monitoring. Crowd concentration estimation, mobility patterns, anomalies in monitored assets.

Decisions. Maintenance, support to operator tasks, instructions to users, user assistance, incident handling (incl. evacuation), insights to retail.

RAILWAYS



Monitoring. As in ports/airports; **traffic** carried.

Decisions. As in ports / airports; support to itinerary planning (frequency, etc.)

In vehicle aspects. Conditions of passenger transfer, vehicle aspects.

Infrastructure. Status and quality of infrastructure.

City aspects. Air quality levels, other environmental parameters.

OBU based. On board processing unit developed also for logistics applications

BUSES

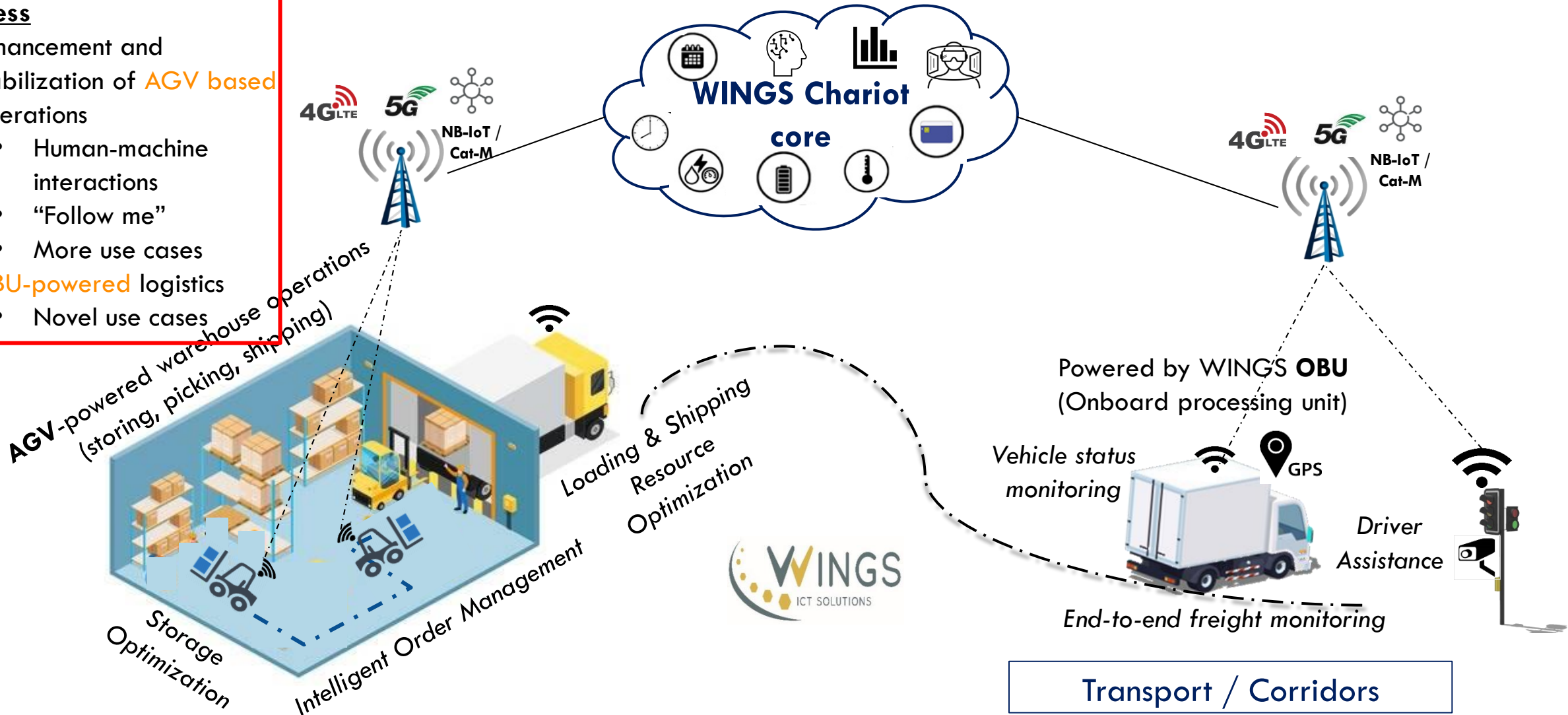
Buses as "city sensors"
Advanced services to passengers and community



WINGS-Chariot (Logistics, I4.0/I5.0)

Progress

- Enhancement and stabilization of **AGV based** operations
 - Human-machine interactions
 - “Follow me”
 - More use cases
- **OBU-powered** logistics
 - Novel use cases

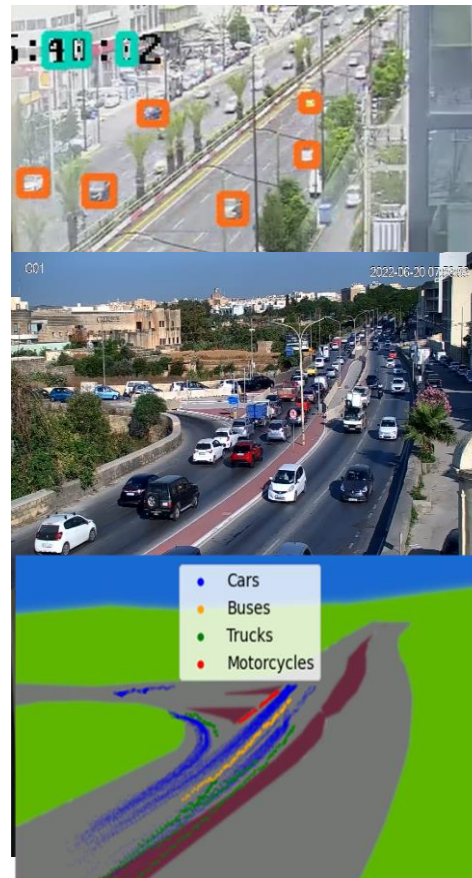
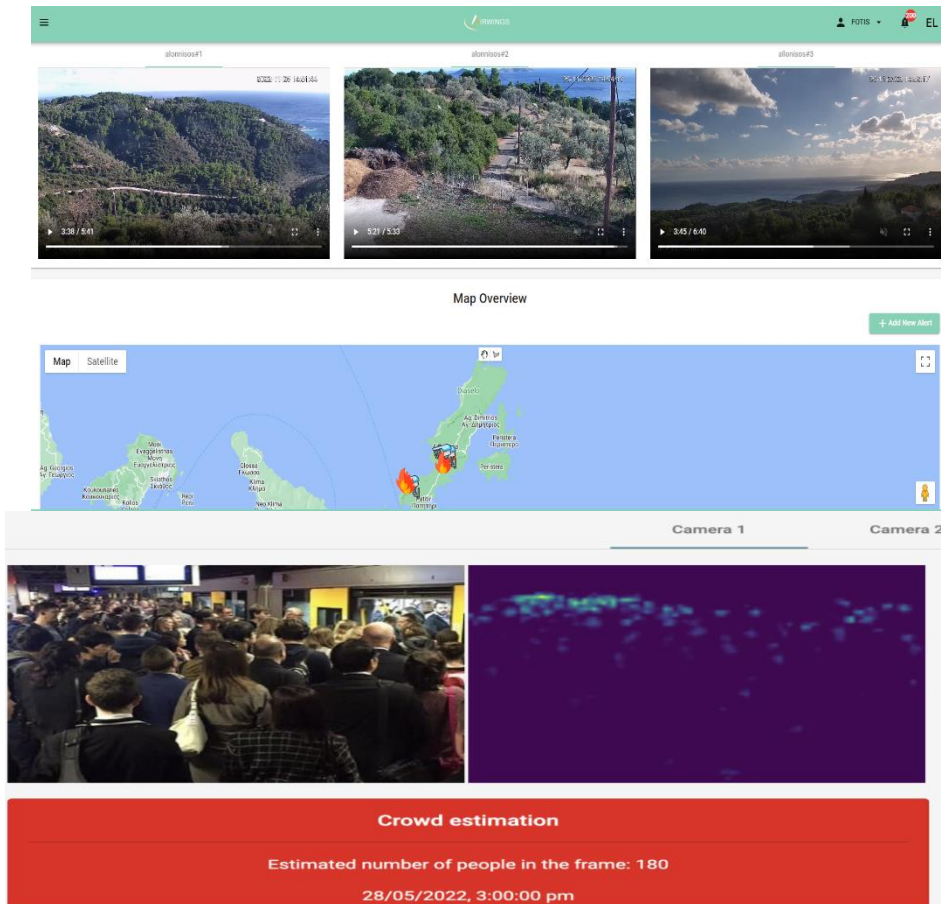


Delivering Complex Visions

Digital Transformation of Cities

Covering all important factors for liveability

- **Air, Environment / Civil Protection, Water / Energy / Gas, Transportation optimization, Health / Wellness** aspects
- Products engaged: **AIRWINGS, ARTEMIS, WINGSPARK, STARLIT**



INNOVATION
FOR
SUSTAINABILITY
AND GROWTH

We develop
the technology of tomorrow
to improve
our cities today

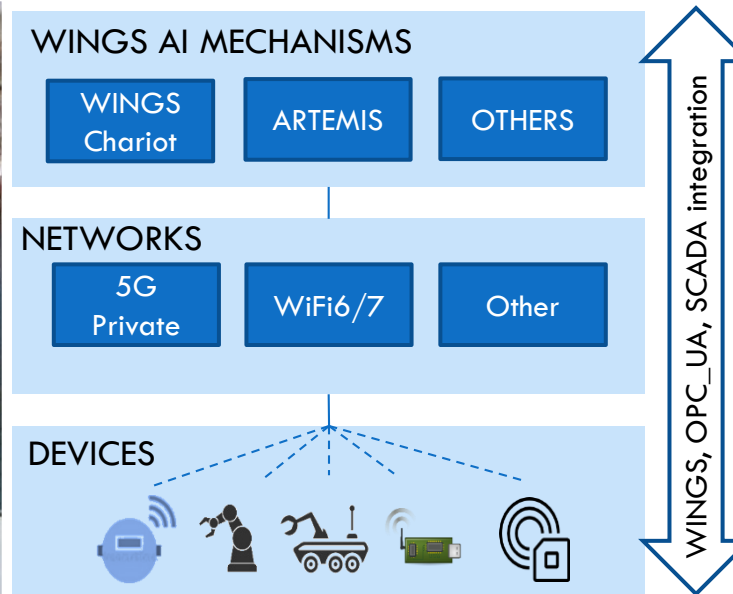
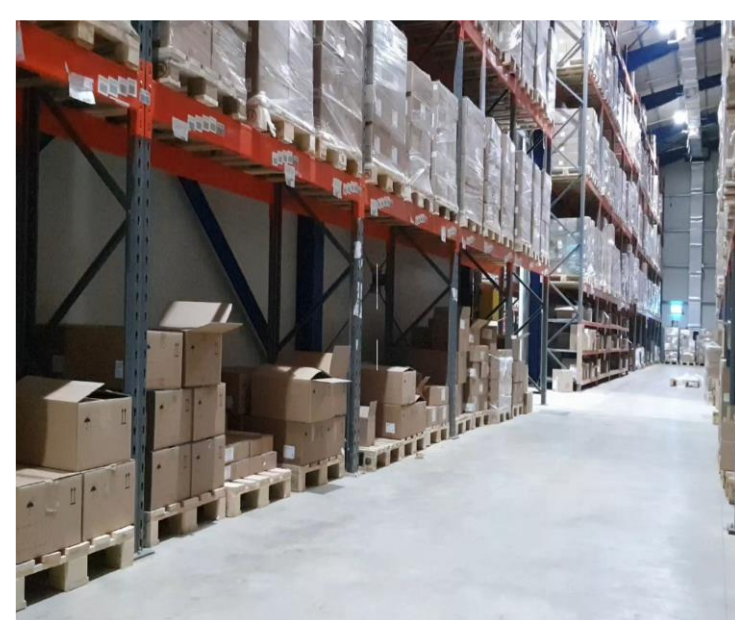


Smart Manufacturing – Industry 4.0



Key factors for smart manufacturing

- **Sustainability**, Energy efficiency, **Automation** / Intelligence, **Resilience**, Worker **wellness** / comfort
- Products engaged: **WINGSChariot**, **ARTEMIS**, **AIRWINGS**, **STARLIT**
- **Robotics**, sensors, **networks**, big data, **AI**, XR, digital twins, integration with legacy technologies (SCADA), leverage on standards (OPC-UA)
- Raw material inspection, process optimization, energy / resource efficiency, assemblies, welding, product quality check, logistics optimization
- **Process** industries (food, cement, etc.), **Discrete** manufacturing (machines, etc.)



Technologies for
SMART MANUFACTURING
to Unleash Productivity, Resilience
& Sustainability

Concluding messages

- Opportunities
- Requirements / needs in various sectors
- Technologies and efficient solutions
- Programs / instruments on which to leverage
- Time for action / synergies

Contact Information



WINGS ICT Solutions PC

Address - 189, Syggrou Avenue, 17121, Athens, Greece

Phone - +30 215 5011 555

Web - <http://wings-ict-solutions.eu>

E-mail - info@wings-ict-solutions.eu

 @WINGS.ICT

 @WINGS_ICT

 @WINGS ICT Solutions

 @WINGS ICT