7th Italian Workshop on Embedded Systems 7th Italian Workshop on Embedded Systems
September 22-23, 2022
School of Architecture - Bari, Italy

SmartMe

Paving the way to Society/Industry 5.0. The SmartMe.IO Experience

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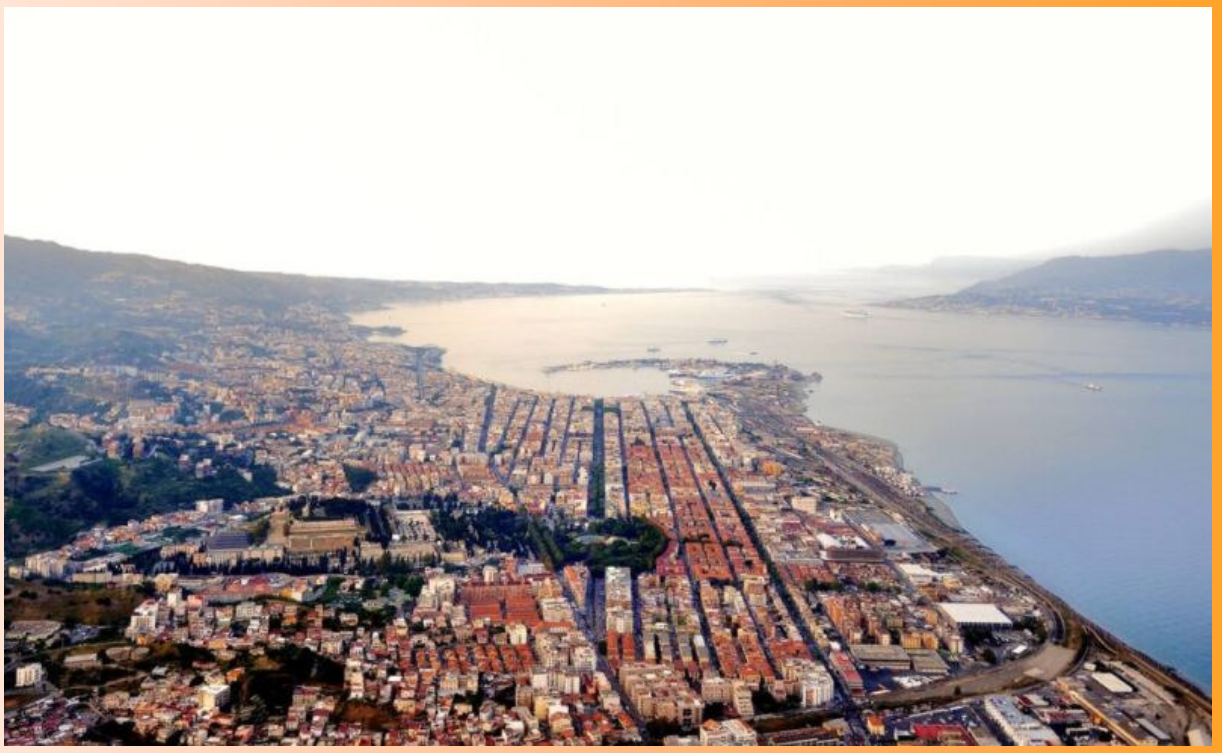
SmartMe

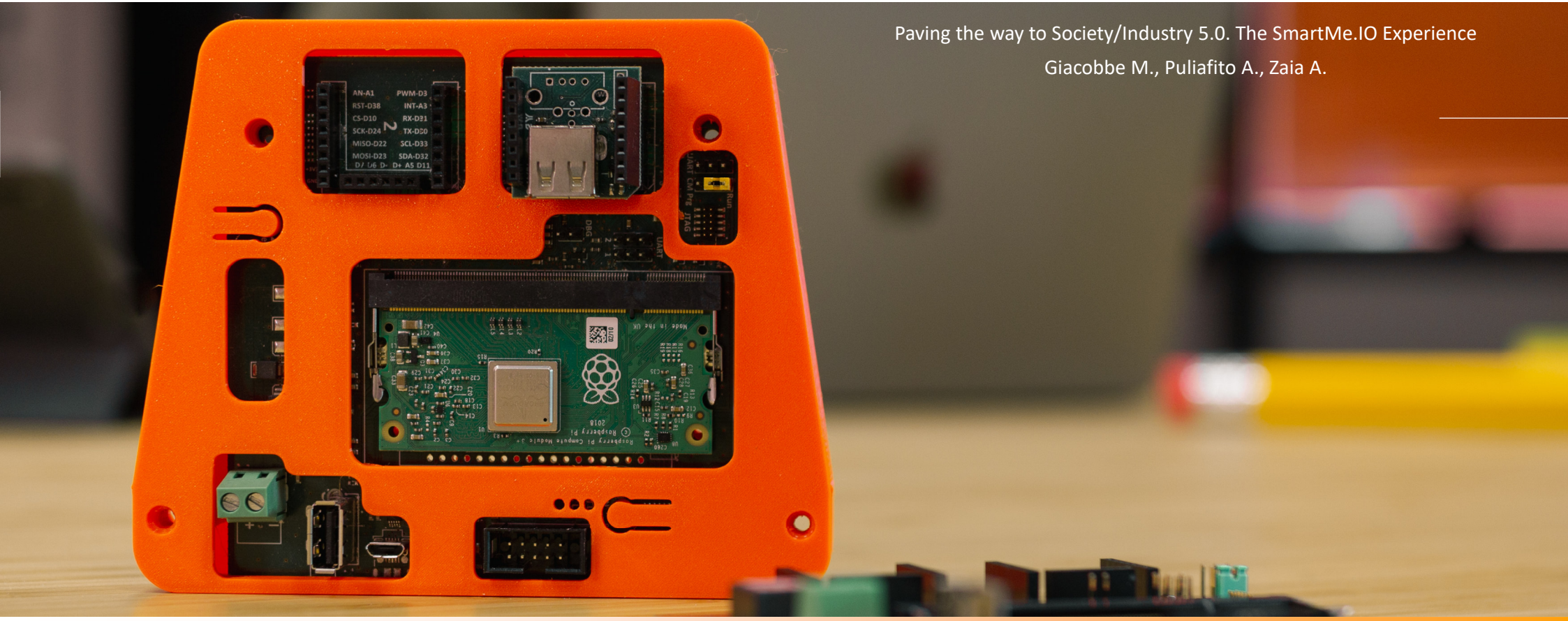
The Company

- Innovative StartUp born as an Academic SpinOff in 2017
- Lamarck SMAU Award 2017, SMAU Palermo Award 2019, Best Practise Award for the Municipality of Siracusa 2019
- CNET : *“These smart cities in Italy put Silicon Valley to shame”*
- Design, Hw/Sw Production, Consultancy firm
- Smart Cities, Smart Communities, Industries (B2B)
- 35 professionals, 5 university professors in computer science and cyber-physical systems

SmartMe

The Company



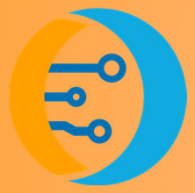


The SmartMe Vision concerning Resilient and Sustainable Cities

Resilience, Sustainability, Creativity

New needs and priorities

- **Focus:** SmartMe focuses on collaborative industries, bioeconomic, human-centered and creative products and services
- **Technology:** SmartMe has evolved its Arancino technology in a full-stack platform meeting resilience and sustainability requirements
- **Method:** Life Long maintenance, i.e.:
  - resilience towards unforeseen problems
  - sustainability in order to intervene on the maintenance of only worn components,
  - centrality of operators taking care not to alter the quality, safety and impact on the workplace



Resilience and Sustainability

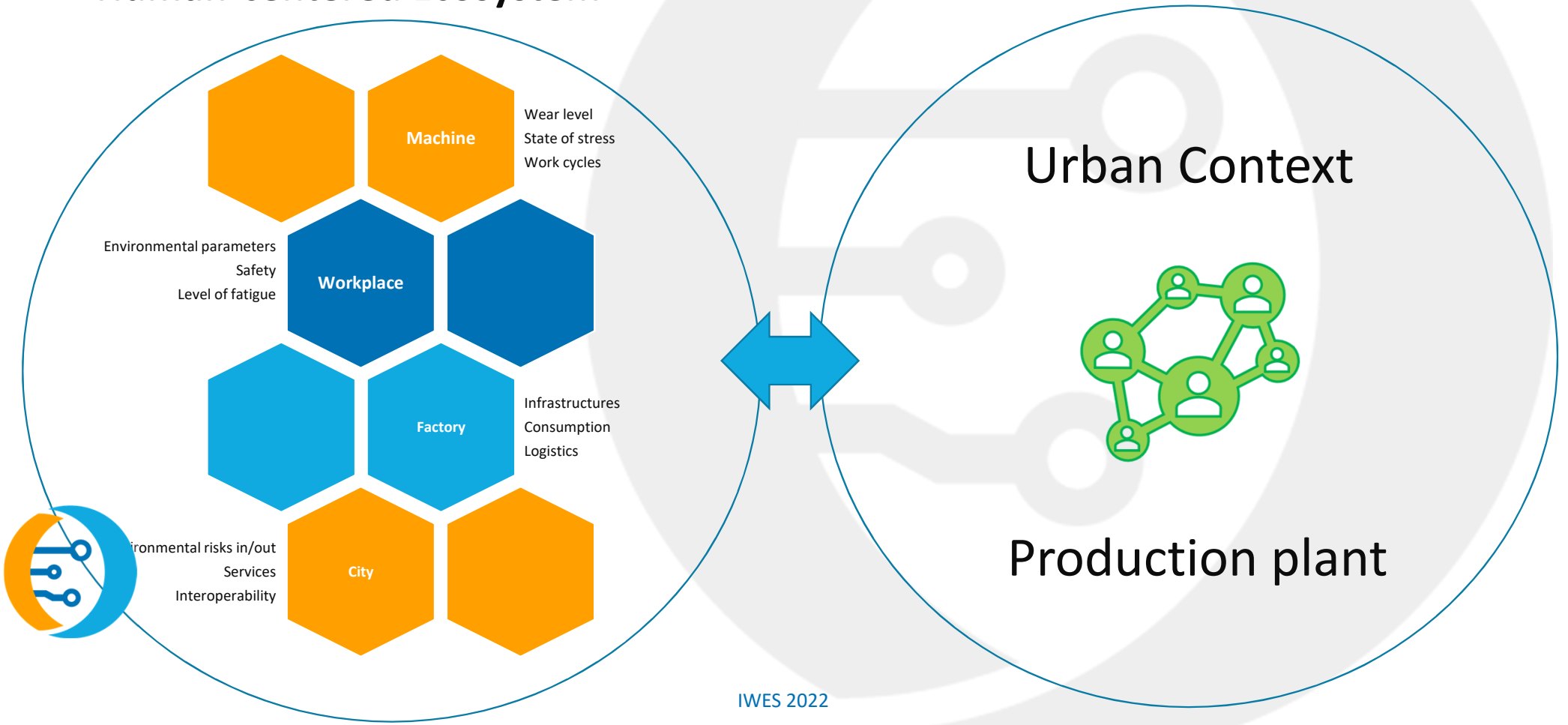
Arancino meets resilience because it makes a system able to anticipate, react and learn timely and systematically from any crisis and thereby ensure stable and sustainable performance.

Arancino meets sustainability because it makes a system able to maintain or support a process continuously over time.

Arancino implements the self-consciousness in industrial processes. We define a self-conscious system as the process of self-control motivated and directed by the system itself, inspired by biological mechanisms.

Industry 5.0

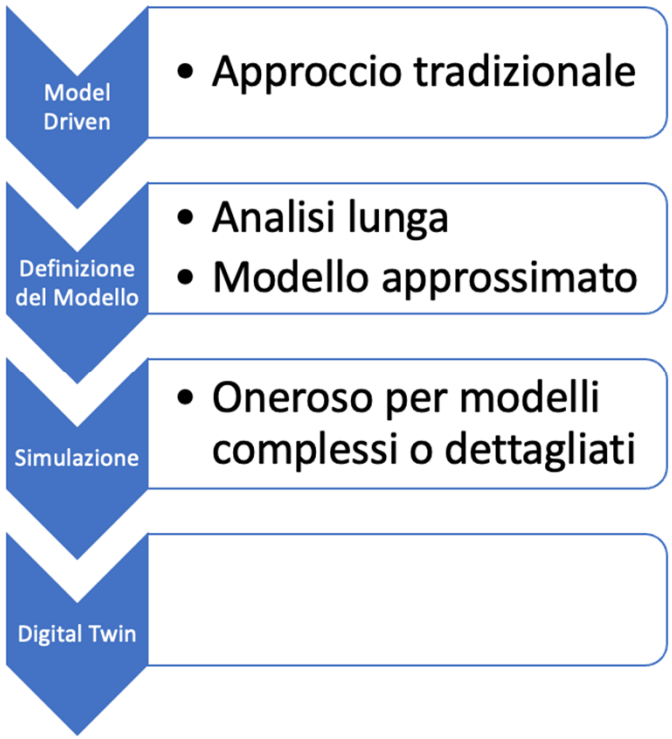
Human-centered Ecosystem

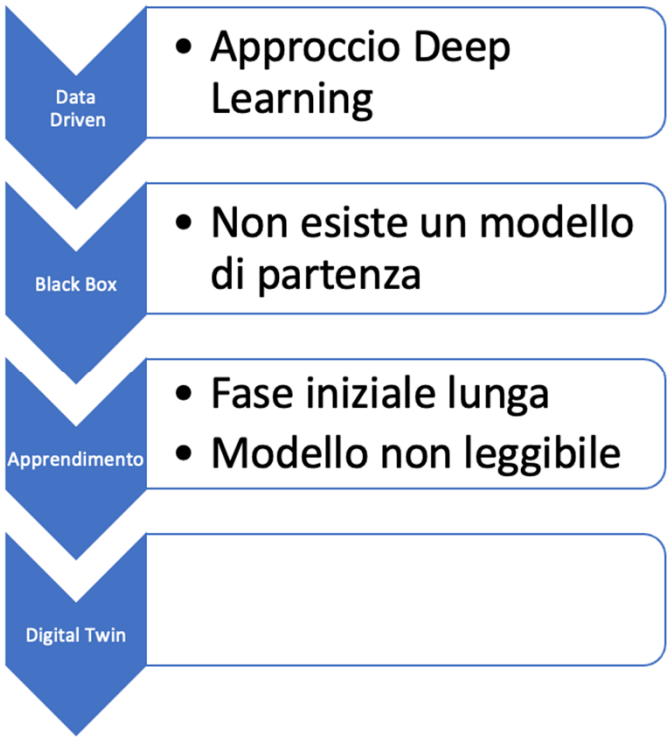


How?

METHOD

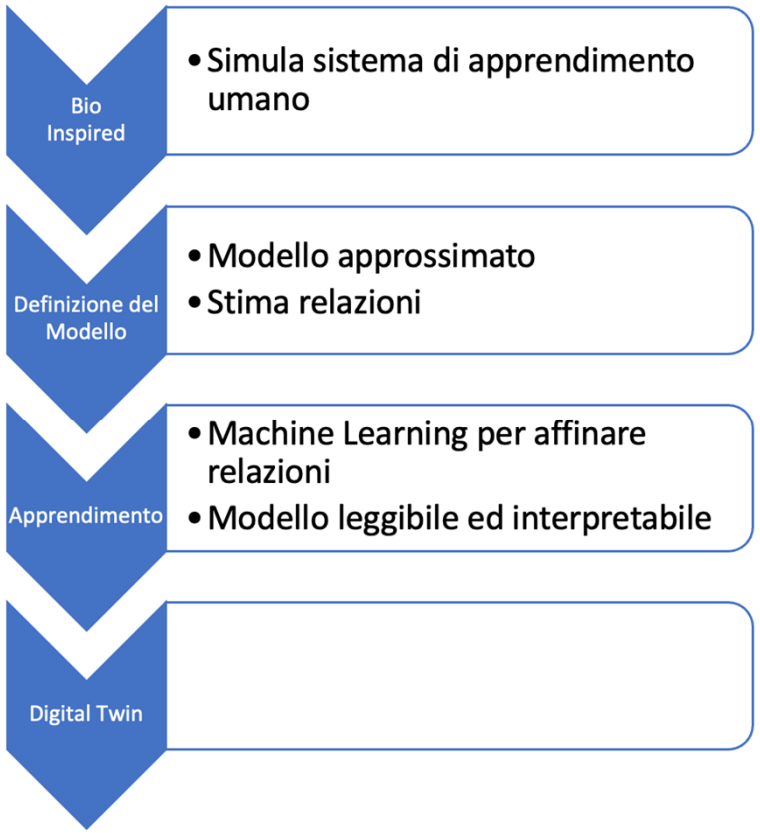
Model Driven VS Data Driven

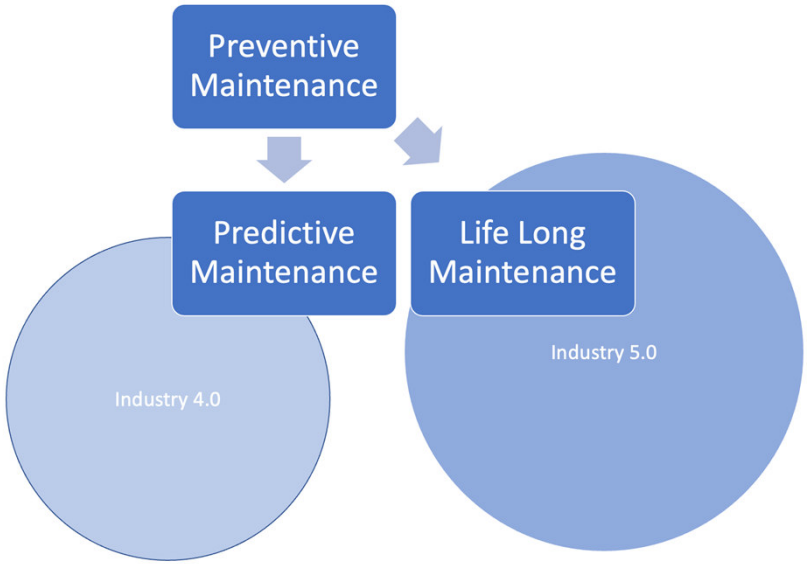




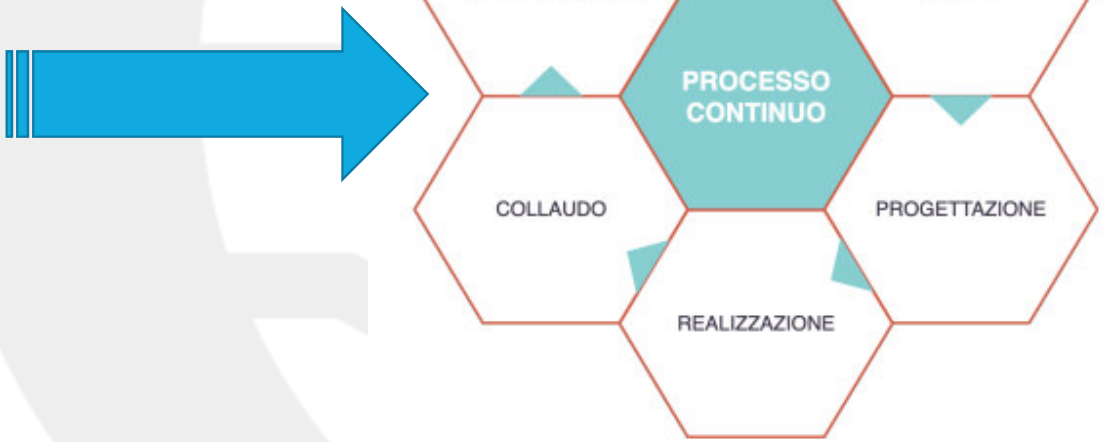
SmartMe Approach

Model Driven VS Data Driven

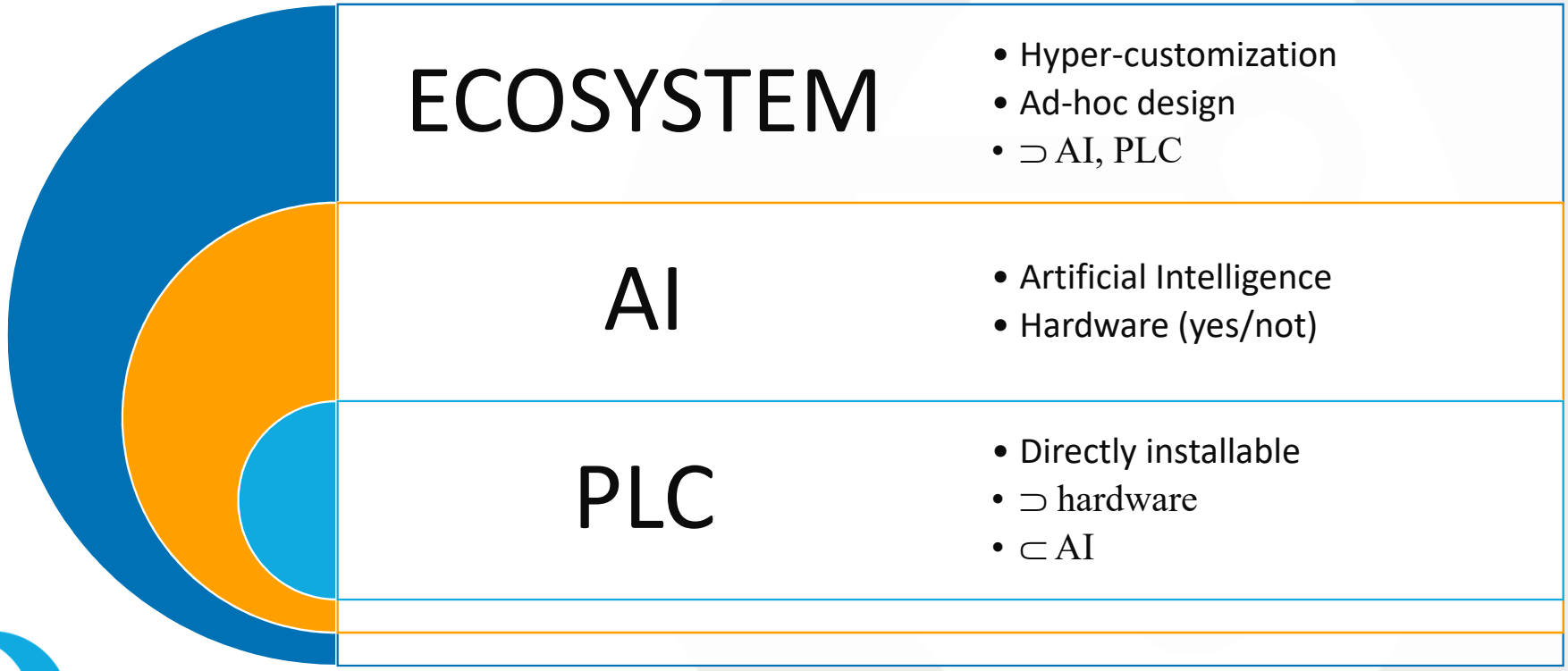




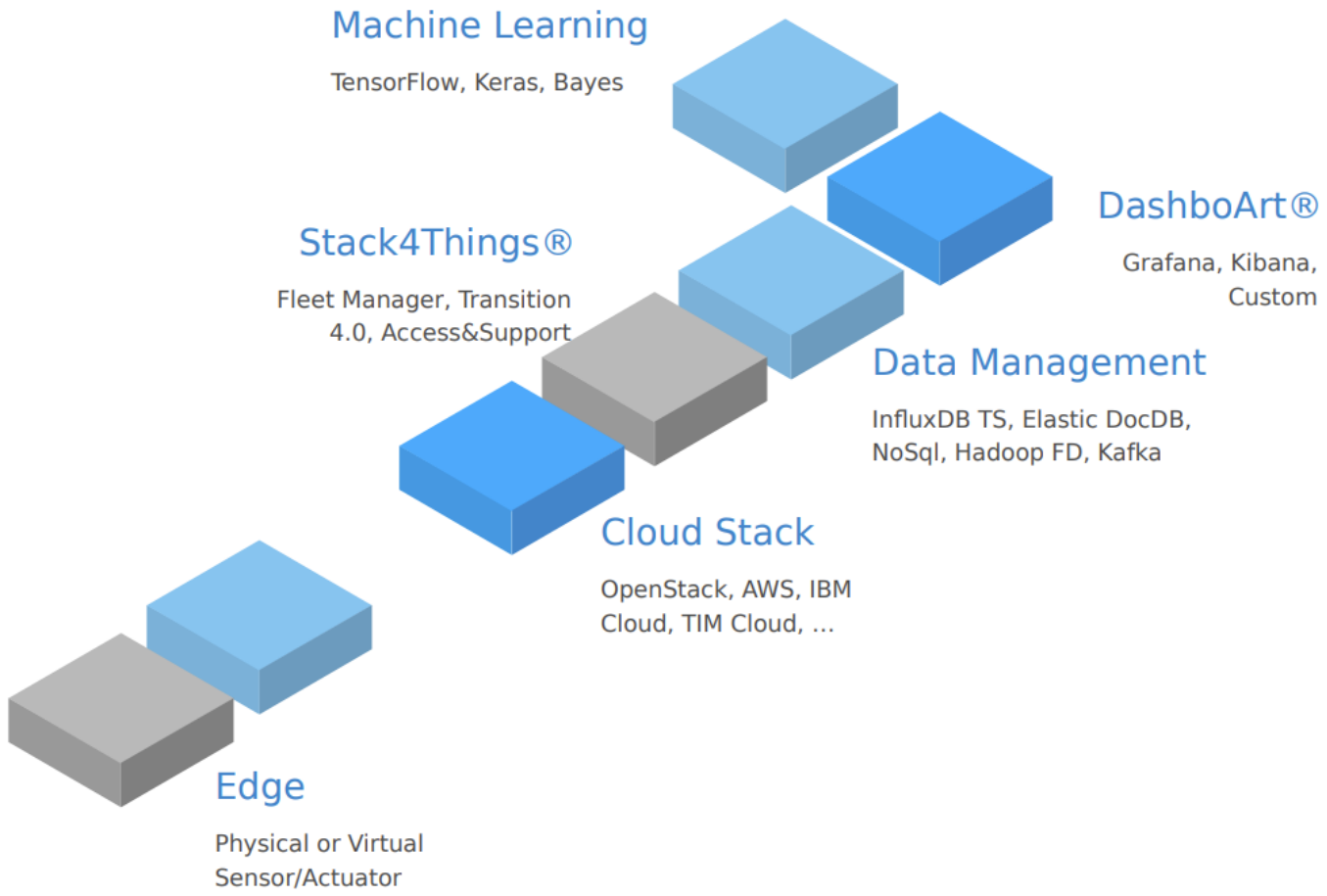
Approach to Design



Arancino Ecosystem

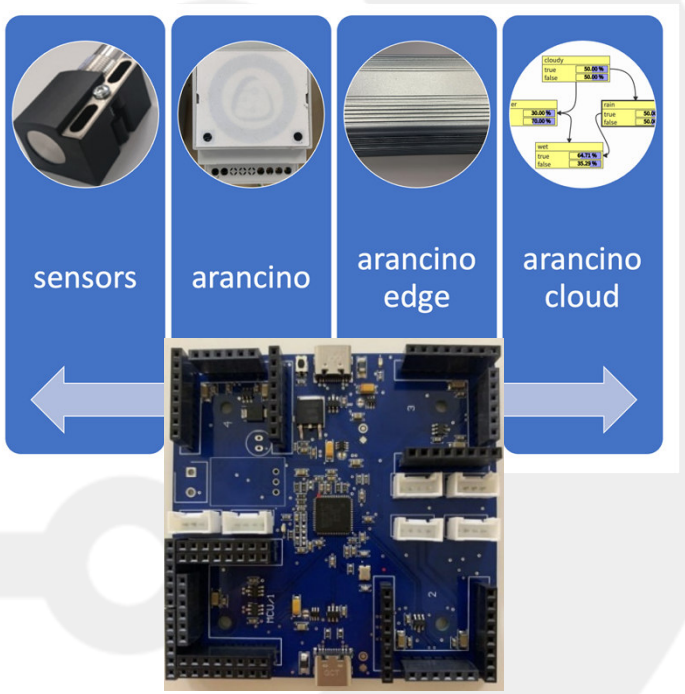


Arancino Ecosystem



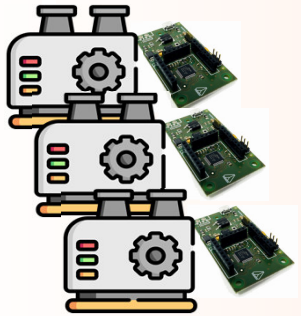
Arancino.AI

SmartMe.IO has created several Arancino technological modules, each one equipped with one or more “accelerators”.
Arancino makes the production cycle where it is applied resilient, based on the principle of mutual collaboration between communicating systems.
Arancino “injects” its accelerators (i.e., Artificial Intelligence, Machine Learning, Cloud Computing, Internet of Things, sensors and/or actuators). where adaptable production capacity and flexible business processes are required.



From connectivity to IoT applications

Machine with Arancino



Interfacing with machinery and sensors

Arancino Edge

Collection and early stages of data analysis

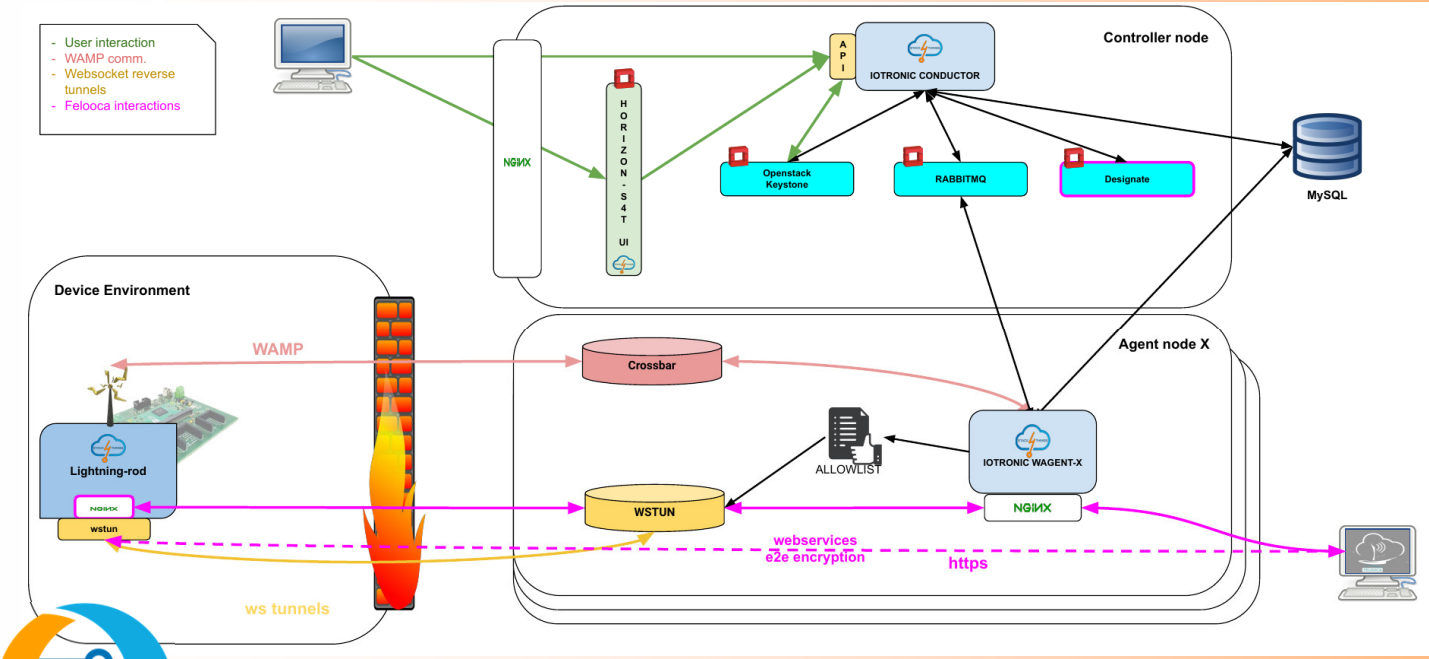
Connectivity

- Mobile EMnify
- LoRa
- Eth/WiFi

Cloud

- Stack4Things®
- Fleet Manager
- Ecosystem

Cloud | Stack4Things

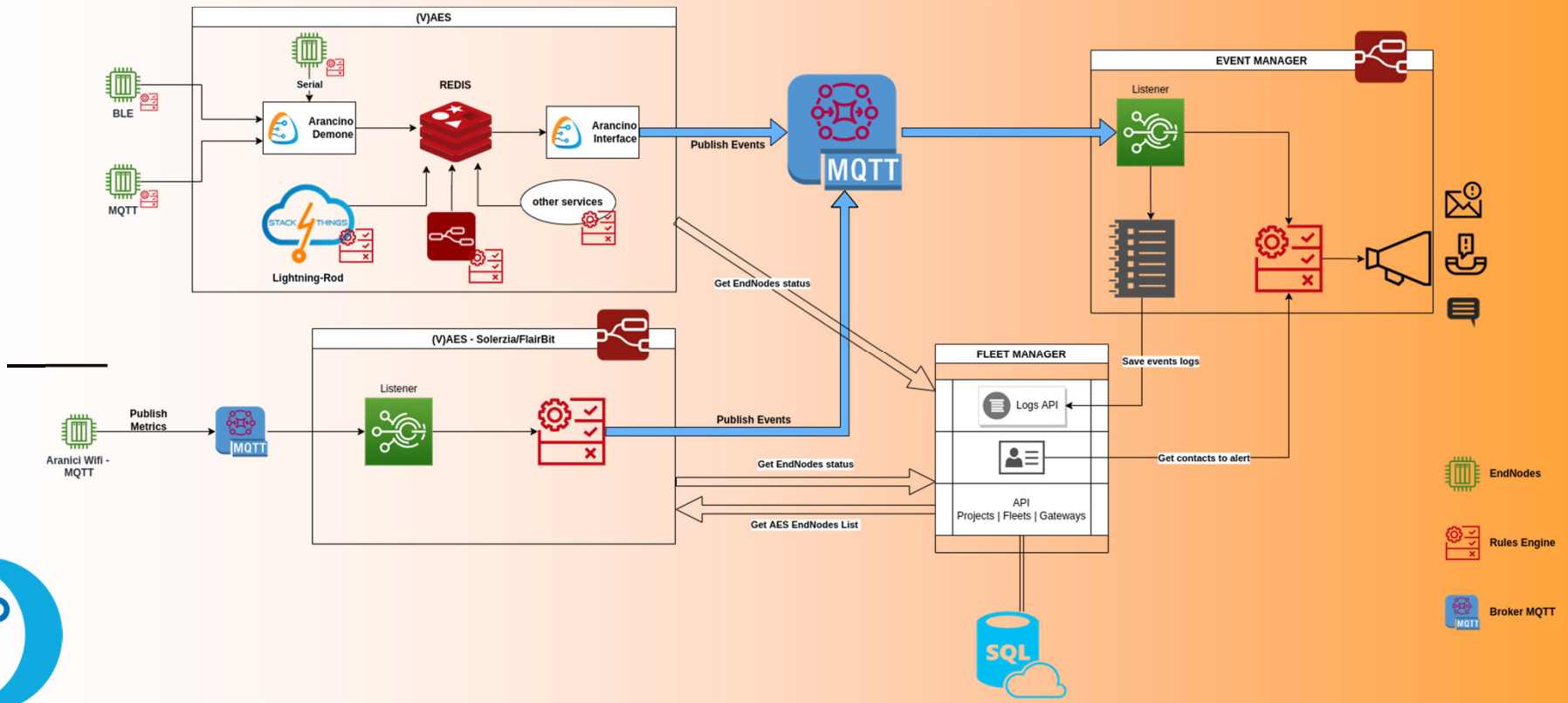


Stack4Things® is the open source software stack for remote management of Cloud devices, communication, data visualization and Machine Learning for predictive maintenance.

Stack4Things® allows to manage fleets of IoT devices without worrying about their physical location, their network configuration, and their underlying technology. It is a cloud-oriented horizontal solution that provides virtualization, personalization and orchestration of IoT objects, offering an immediate experience on some of the most popular embedded and mobile systems.

Stack4Things® has been developed to be “compliant”, ie conforming to the services of OPENSTACK.

Cloud – EM – Events flow



Use Cases

Use Case	Scenario	Productivity	Cost-effectiveness	Creativity	Manufacturing quality	Hyper personalization	Self-consciousness	Quality of Life	Energy saving (smart lighting)	Energy saving (Electricity)	Waste reduction	Environmental Quality	Software reuse	Customer experience	Observability	Endurance and Stability	Safety	Arancino Level
A	Ffp2 mask production plant	X	X							X	X				X			Arancino.PLC
B	Luxury label production plant			X	X	X												Arancino.AI
C	Automotive production plant	X					X								X		X	Arancino Ecosystem
D	Renewable energy systems		X						X					X	X			Arancino Ecosystem
E	Metropolitan City interoperability platform							X	X	X	X	X	X	X	X			Arancino Ecosystem
F	E-health and home care		X			X		X						X				Arancino.AI
G	Infrastructure and buildings (bridges, tunnels, viaducts, etc.)														X	X	X	Arancino Ecosystem

Use Cases

SMARTME.IO USE CASES	A – FFP2 P.P.	B – Luxury Labels	C – Automotive
	• Arancino PLC • RS232, Start-Stop • mask-per-minut • Distance (mm) • MQTT-ODOO	• Arancino AI • AI engine • Training • Web platform • Automated quotes	• Arancino Ecosystem • Self-consciousness • Machine Learning • Sensors&Actuators
D – Energy systems	**E – Smart City (Milan)**	**F – Home Care**	**G – Infrastr. & Build.**
• Arancino Ecosystem • Smart Poles • WiFi • LoRaWAN	• Arancino Ecosystem • Interoperability • Heterogeneous Sensors • Heterogeneous Conn. • Dashboards	• Arancino AI • Wellbeing – Welfare • Patient's parameters • Environmental parameters • Heterogeneous Sensors • BLE • 3D Print - hyper-custom.	• Arancino Ecosystem • Gateway/Cloud • Disaster resilience • Climate change • Pollution

Conclusions

SmartMe.IO has focused its strategy on Future Cities issues, specifically resilience and sustainability requirements.

Future Cities will be human-centered and the main focus will be to balance economic and technological advancement to solve society's problems. It represents a new vision for a resilient society where humans, nature and technology create a resilient and sustainable balance enhanced by data.

This research was supported by Smart & Start Italia - PON IC 2014-2020, CUP C44H20000540008 / COR 2744258.

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Thanks!

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