ITU KALEIDOSCOPE ONLINE2020

7-11 December 2020

Managing Industry 4.0 Initiatives

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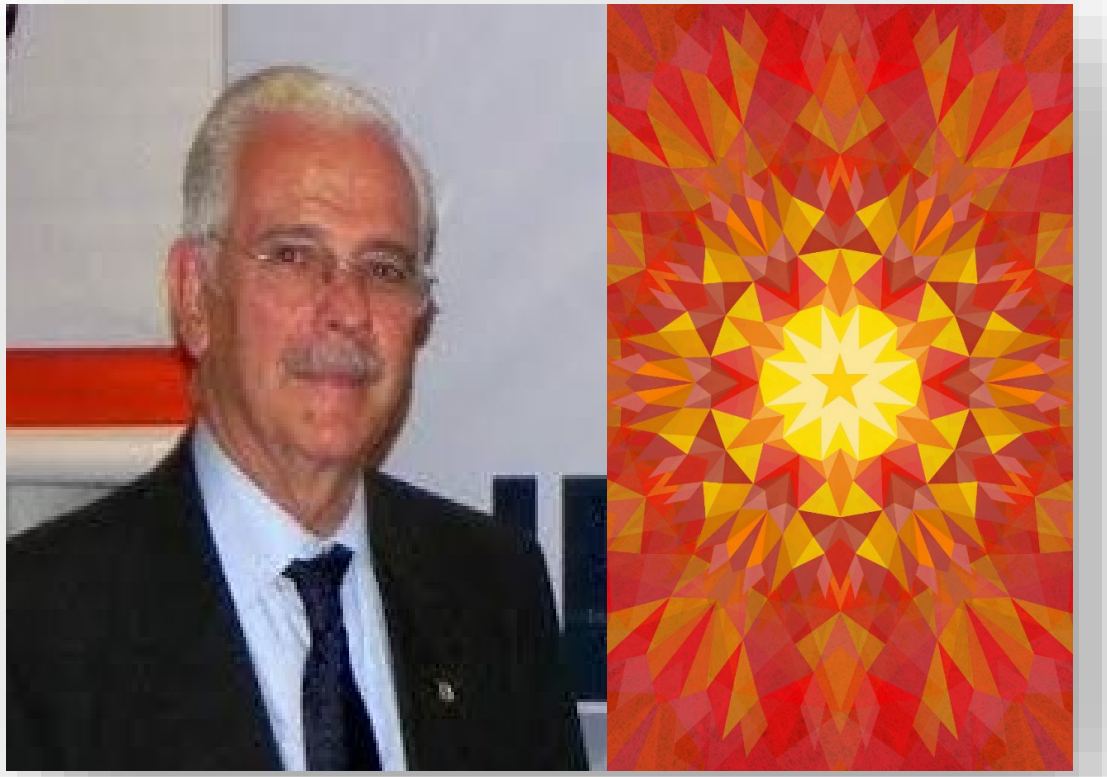
IEEE Technology and Engineering Management Society

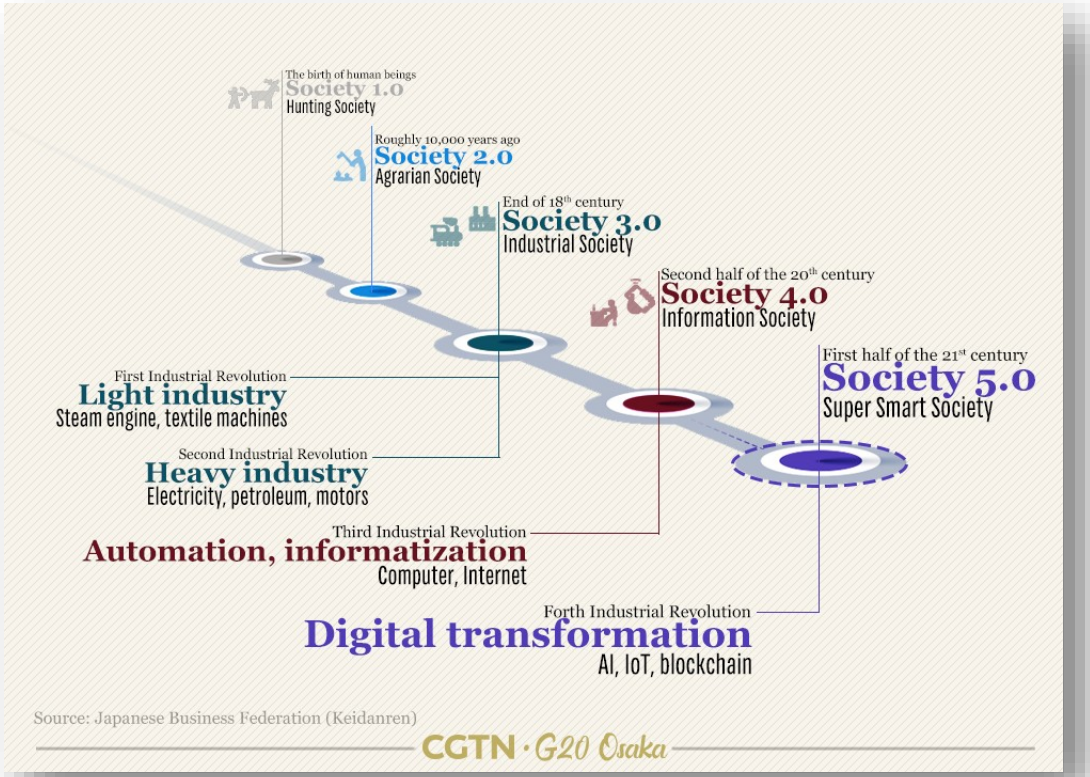
Session agenda:

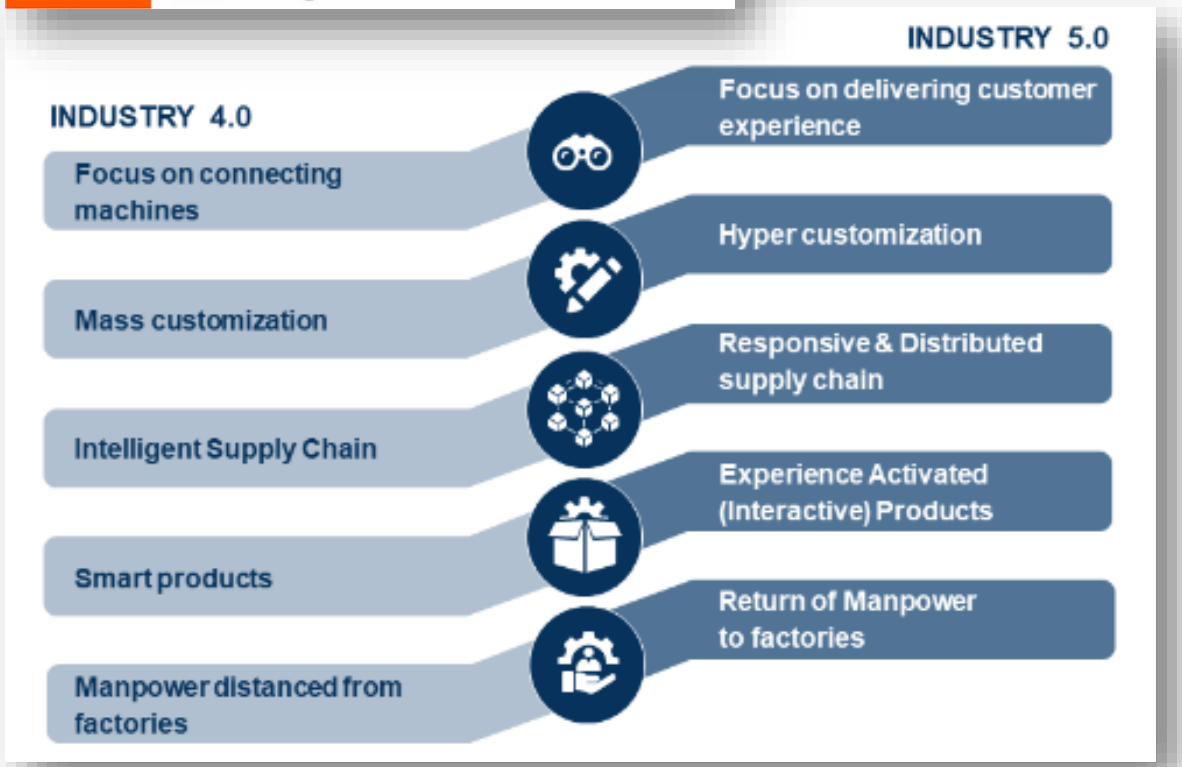
Technological disruptions and I 4.0 Models
The value of Management in Digital transformation
Strategic Change Management
Human factor Challenges
Innovation Management
Market focused Business Strategies
Managing Risk Security applied to I 4.0



gianna@ieee.org

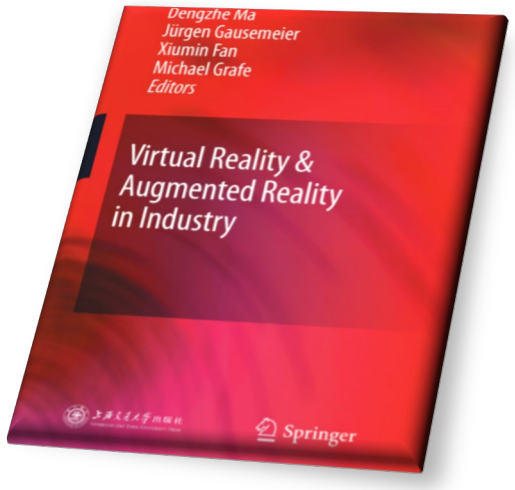
DIGITAL TRANSFORMATION



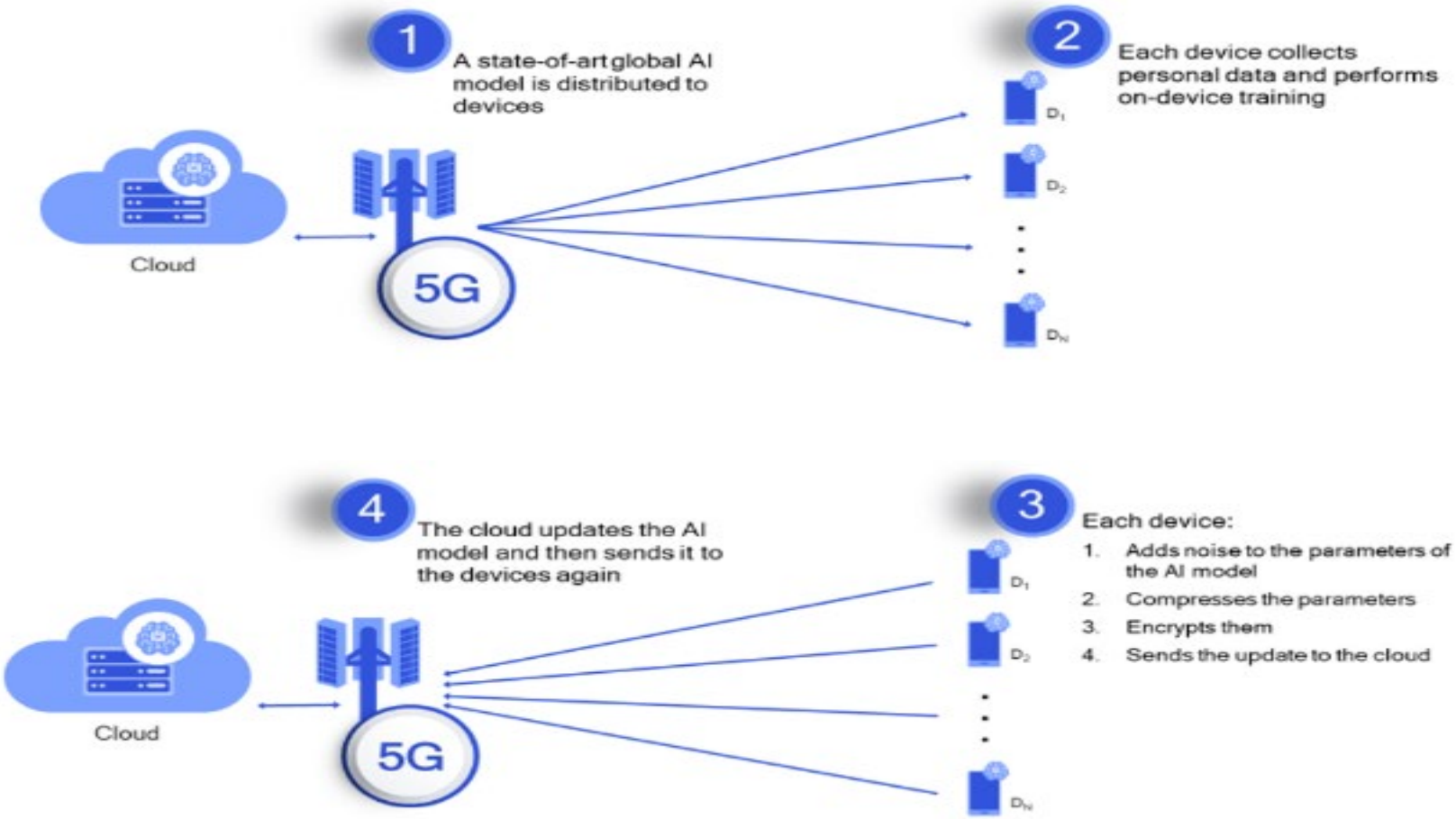


AI, VR IN INDUSTRY

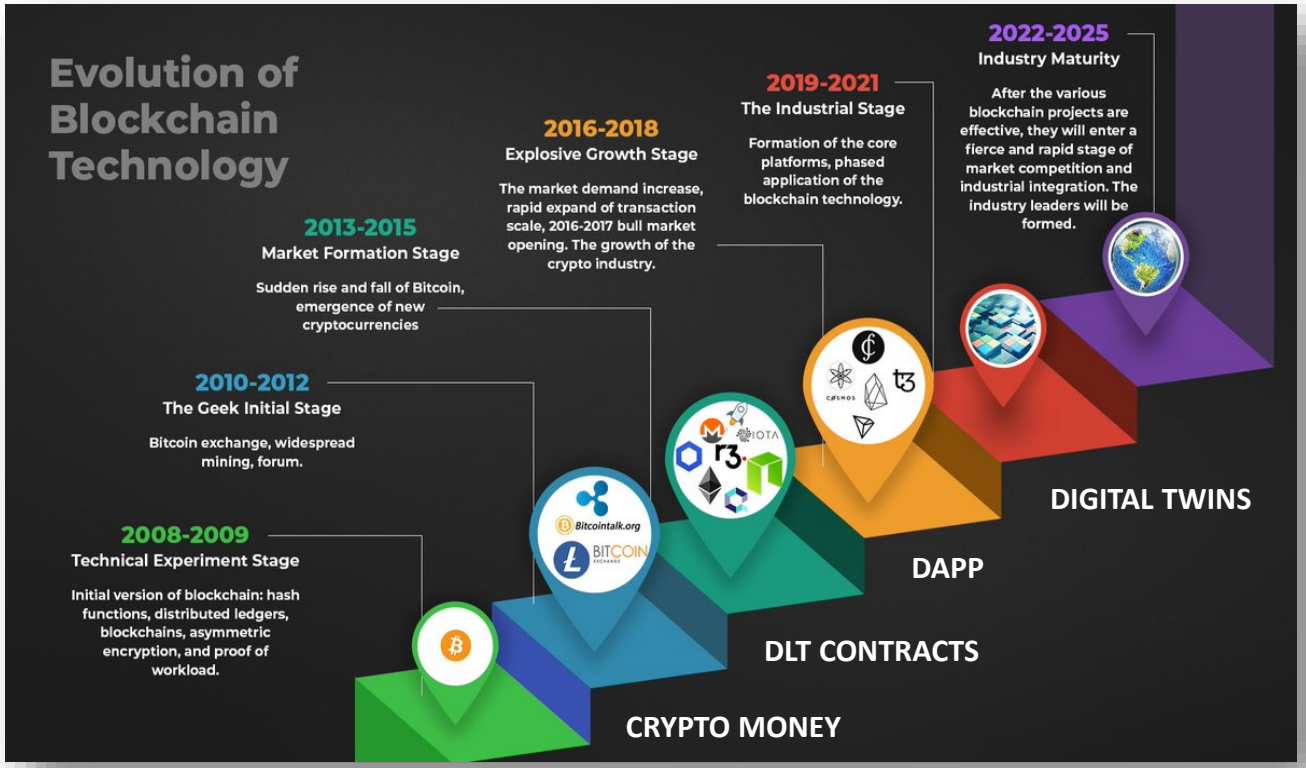
- Advanced analysis techniques
- Predictive analysis
- Machine learning
- Image analysis Comp. Vision
- Natural language processing
- Industrial robotics
- Inventory Management
- Design
- Preventive maintenance
- Prototyping
- Simulations

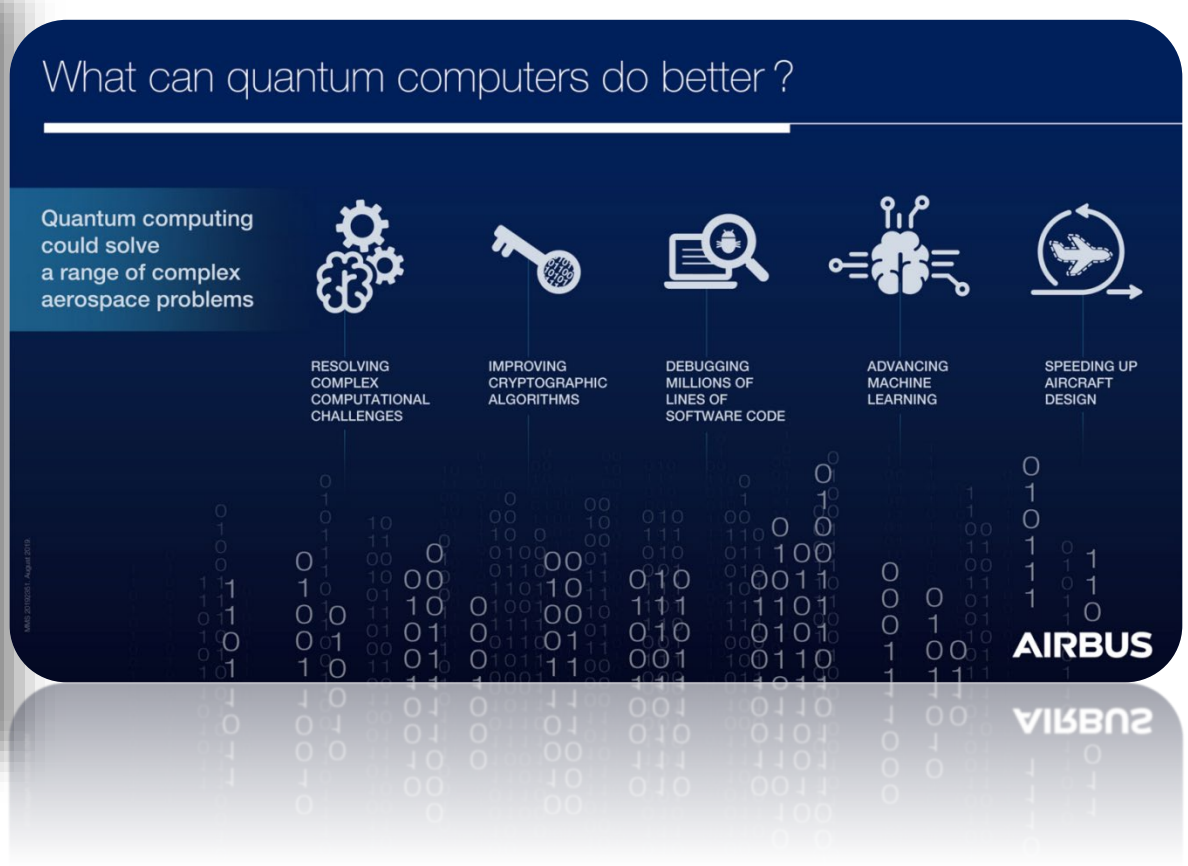


AI DISTRIBUTED LEARNING OVER 5G



BLOCKCHAIN AND QUANTUM COMPUTERS IN INDUSTRY





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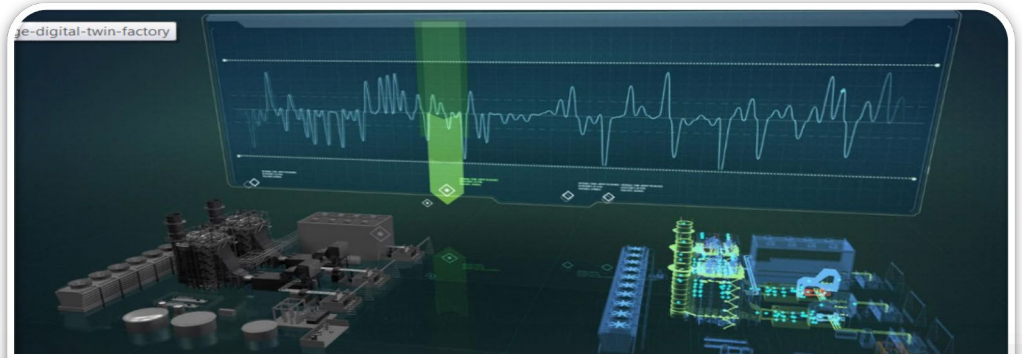
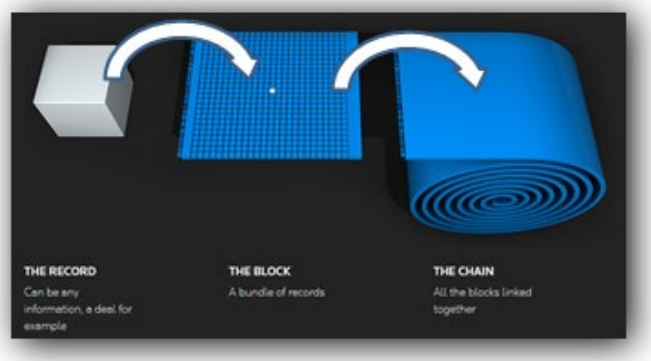
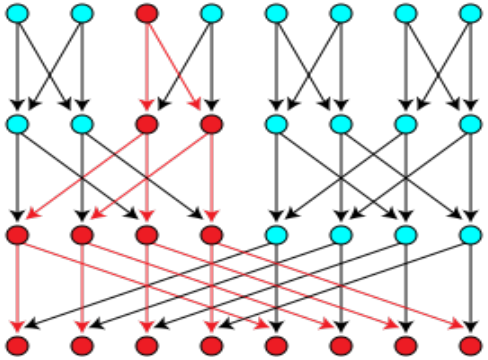
DIGITAL TWIN FACTORY
Digital Twin in IOTA TANGLE DLT

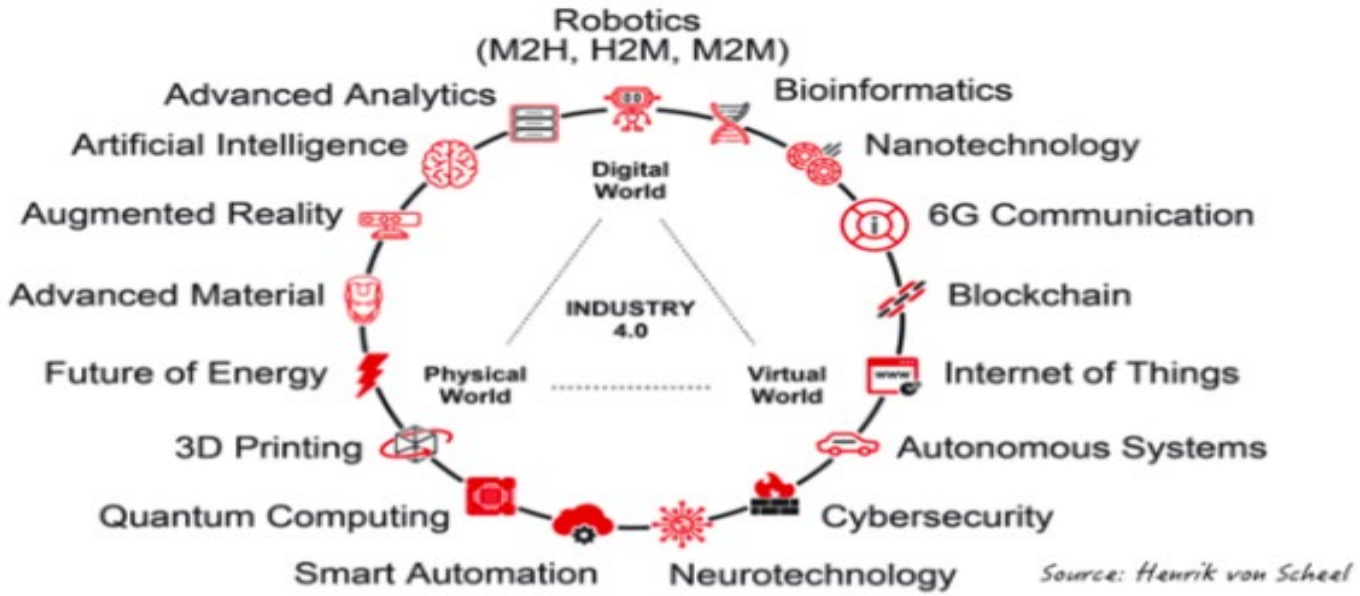






- PROs:
  - be able to make decisions based on its goals and beliefs
  - By having the ability to execute cognitive tasks, a digital twin of a service fulfillment or product manufacturing process will be able to examine the current structure of a system or a process and give recommendations regarding what can be improved at the current moment.
  - Depending on how fast the machine learns, increasing the productivity of your product's development process can be 100X faster and more efficient.
- CONs:
  - A fully thinking digital twin will act like AI that can make its own calculated decisions, process thoughts and execute actions just like a real, functioning organism. This may involve the conscious entity of developing itself outside of the limitations that were implied by humans.

IN SUMMARY



1st wave 2009 - 2016

- Digitalization
- Internet of Things
- Advanced Analytics
- Cloud Computing
- Robotics

2nd wave 2016 - 2025

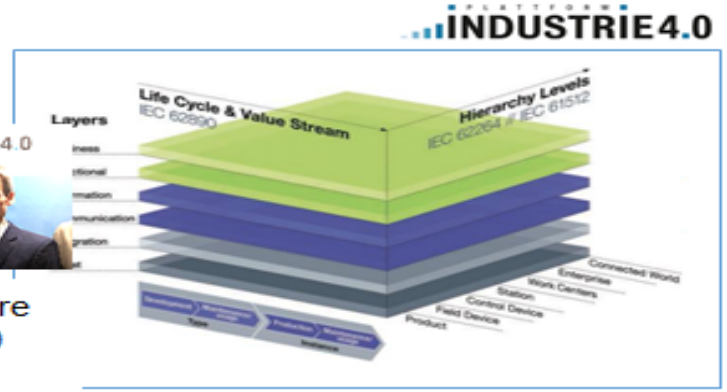
- Artificial Intelligence
- Blockchain
- Smart Automation
- 6G Communications
- Future of Energy

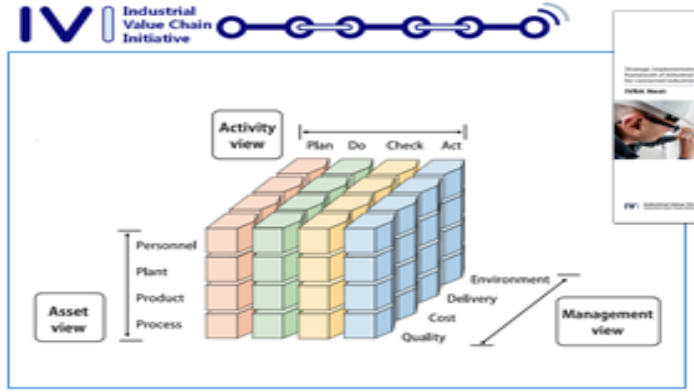
3rd wave 2025 …

- Quantum Computing
- Cybersecurity
- Neuro- & Nano technology
- Bioinformatics
- …

INDUSTRY 4.0 PLATFORMS

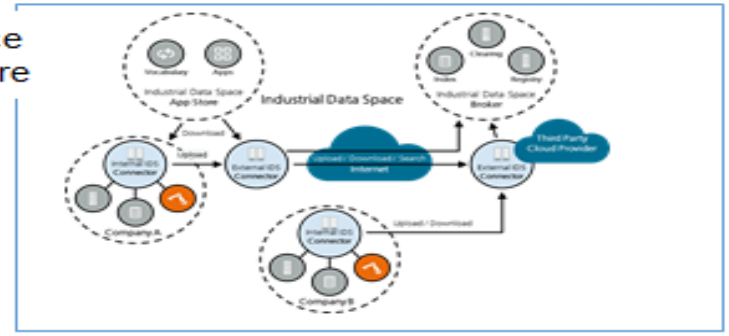
Reference Architecture Model Industrie 4.0 (RAMI 4.0)

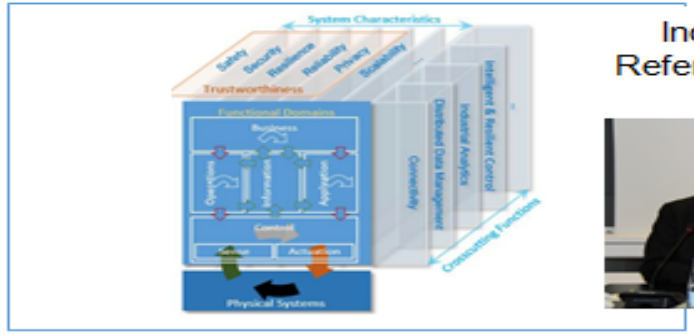




Industrial Value Chain Reference Architecture **(IVRA)**

Industrial Data Space Reference Architecture





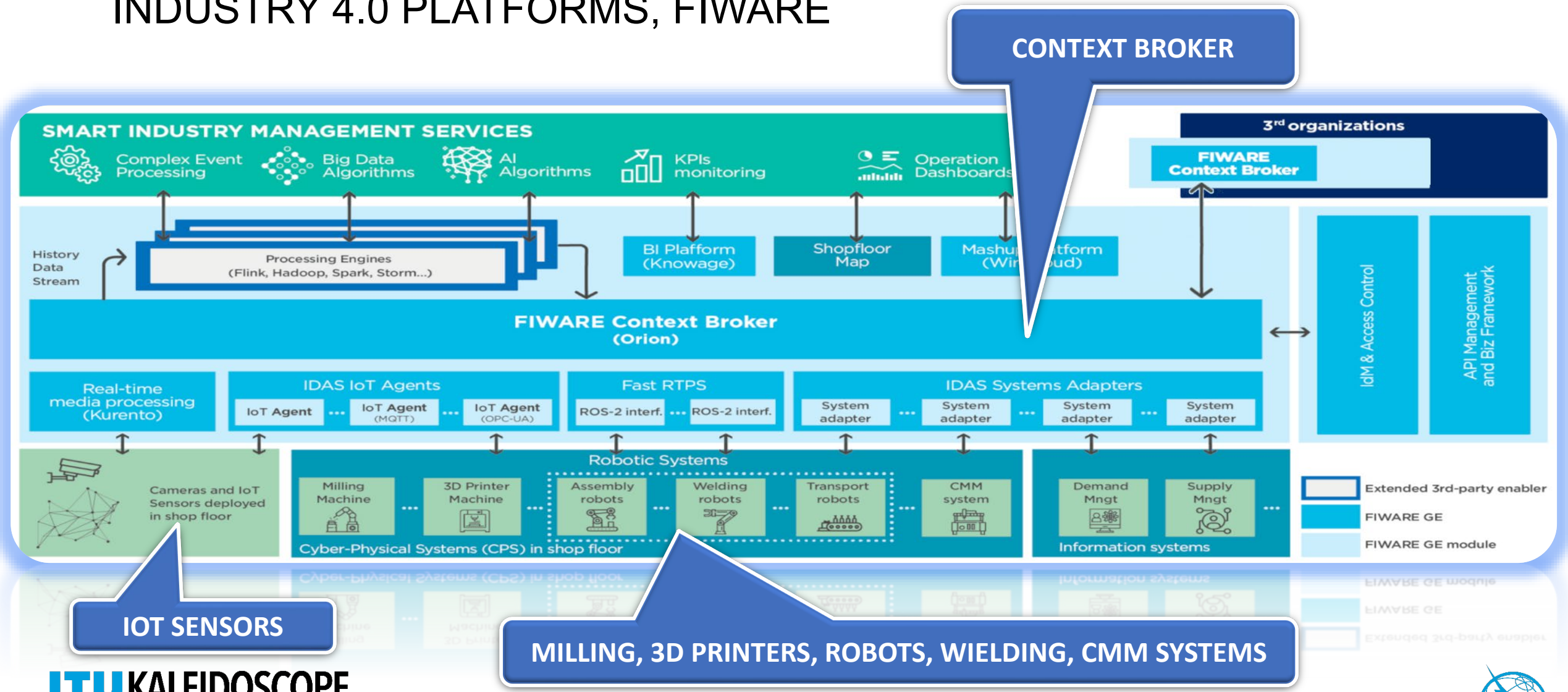
Industrial Internet Reference Architecture (IIRA)

IV Industrial Value Chain Initiative
Connected ! Manufacturing

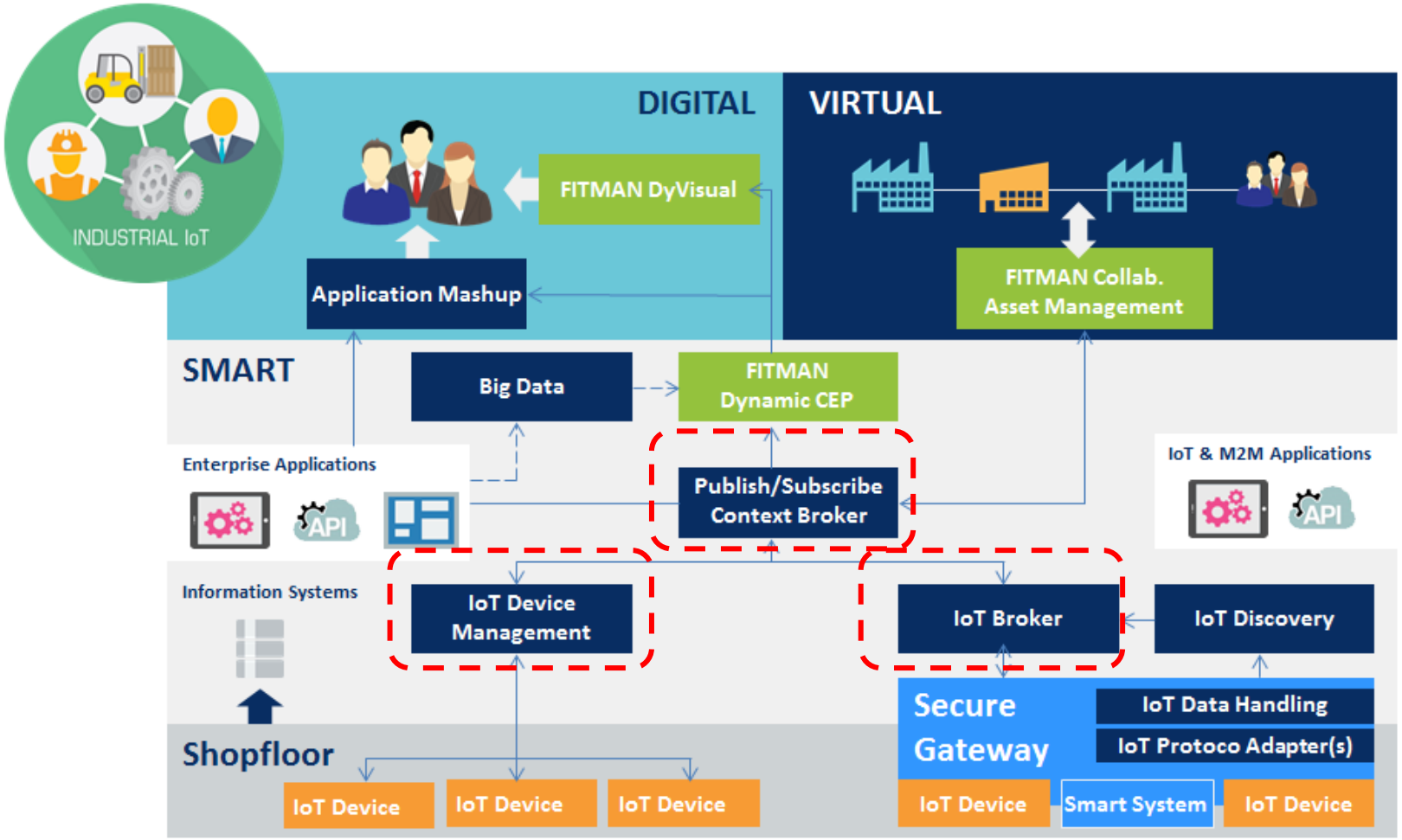
FIWARE FOUNDATION

INTERNATIONAL DATA SPACES ASSOCIATION

INDUSTRY 4.0 PLATFORMS, FIWARE

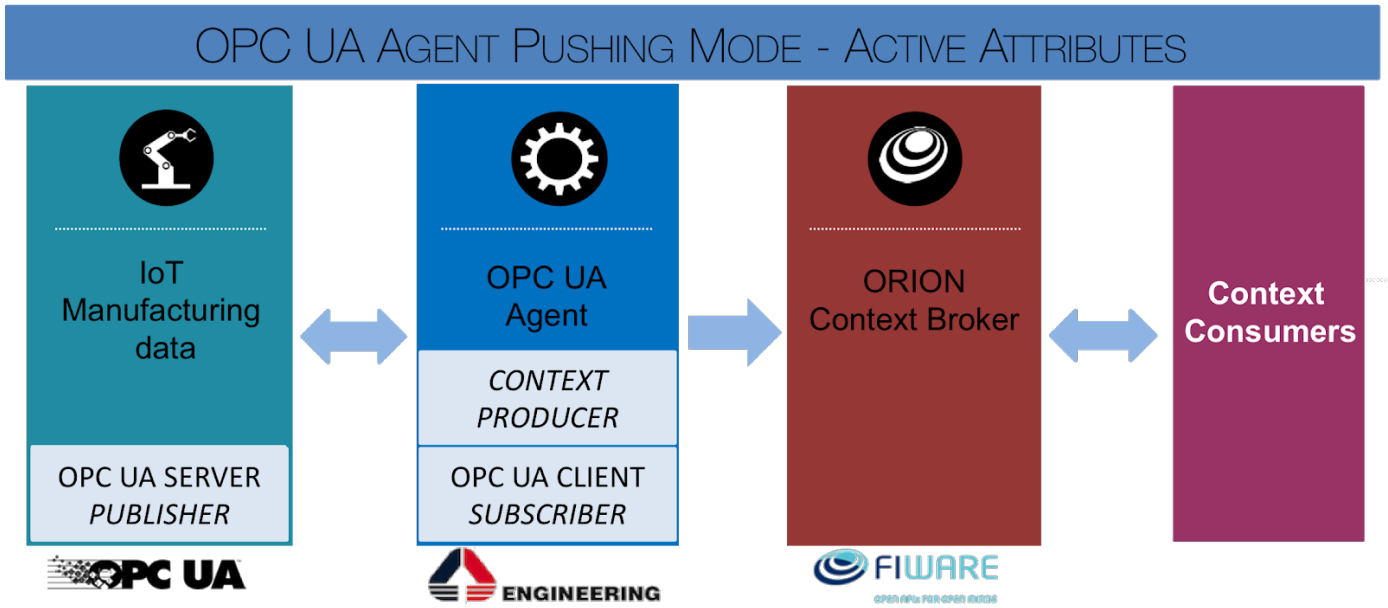


FIWARE IoT AGENTS and Robotic Systems



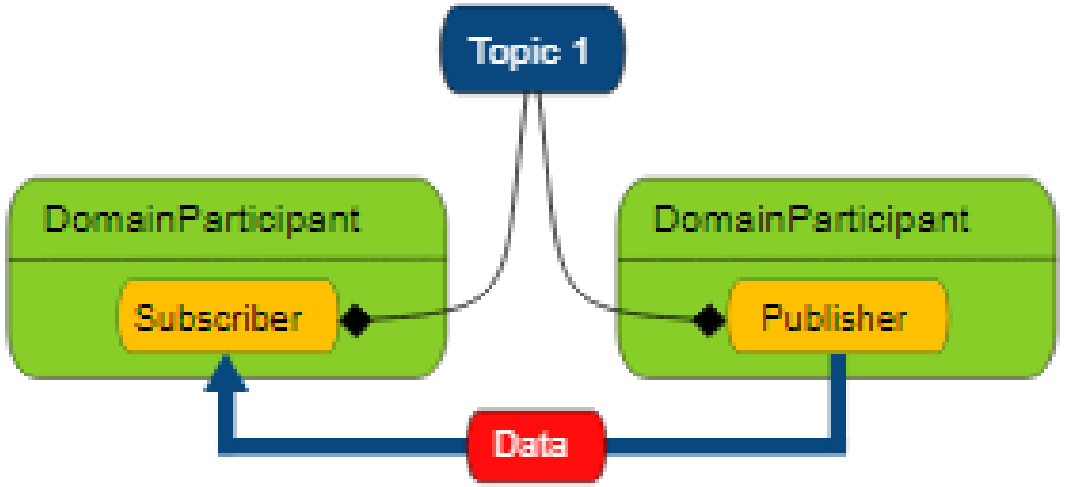
FIWARE IoT AGENTS OPC UA and Robotic Systems

IoT Agent accepting data from OPC UA devices.
Designed to be a bridge between the OPC Unified Architecture protocol and the NGSI interface of a context broker. No software coding is required to adapt the agent to different OPC UA devices.



FIWARE Data Distribution Services and Robotic Systems

eProsima **Fast DDS** is a C++ implementation of the RTPS (Real Time Publish Subscribe) protocol, which provides publisher-subscriber communications over unreliable transports UDP, defined and maintained by the Object Management Group (OMG) consortium.

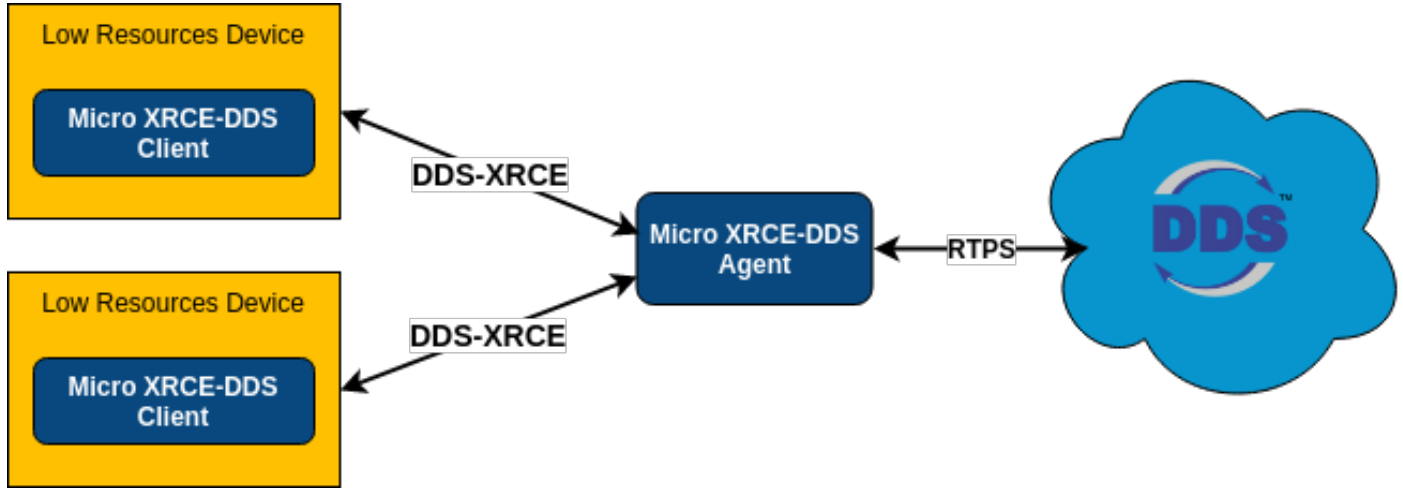


High performance.
Multi-Platform: Windows, Linux, Mac OS, QNX, VxWorks, iOS, Android, Raspbian.
Free and Open Source: Apache License 2.0
DDS compliance: OMG DDS 1.4 Compliant. Minimum profile
Full RTPS compliance: OMG RTPS 2.2 Compliant

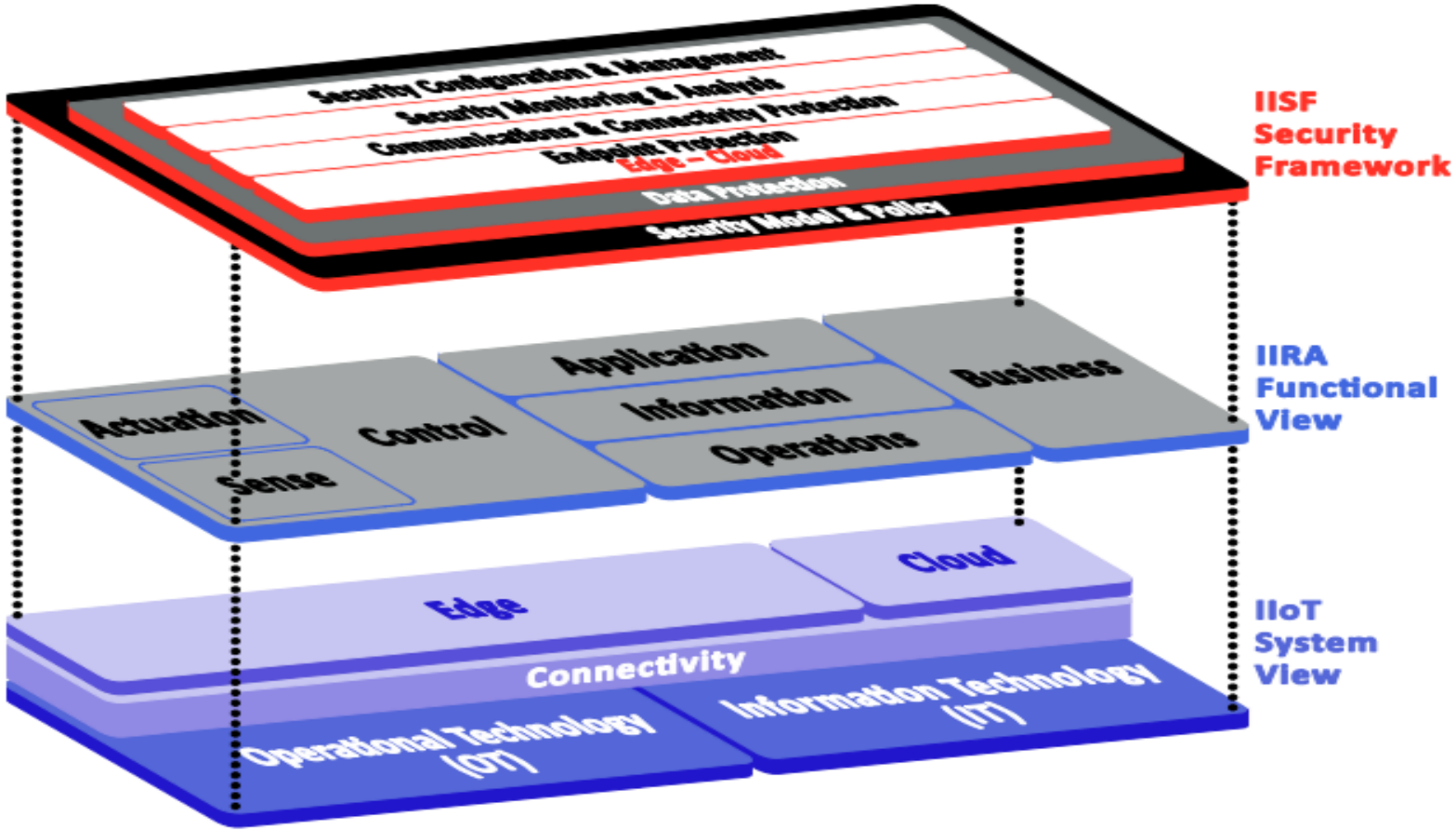
FIWARE Data Distribution Services and Robotic Systems

Micro XRCE-DDS Client (C library) is focused on addressing the challenges of resource-constrained environments. this library is designed to offer a completely dynamic-memory free implementation and really low memory usage (~2.5 KB of stack usage for a simple publisher-subscribe application).

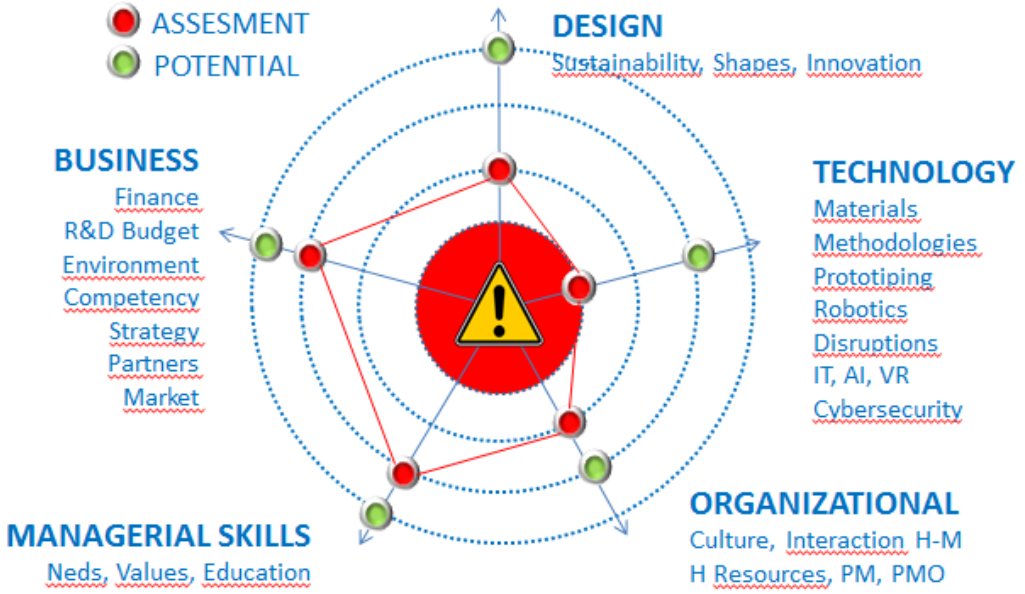
High performance.
Low resources.
Compiler dependencies free.
Free and Open Source.



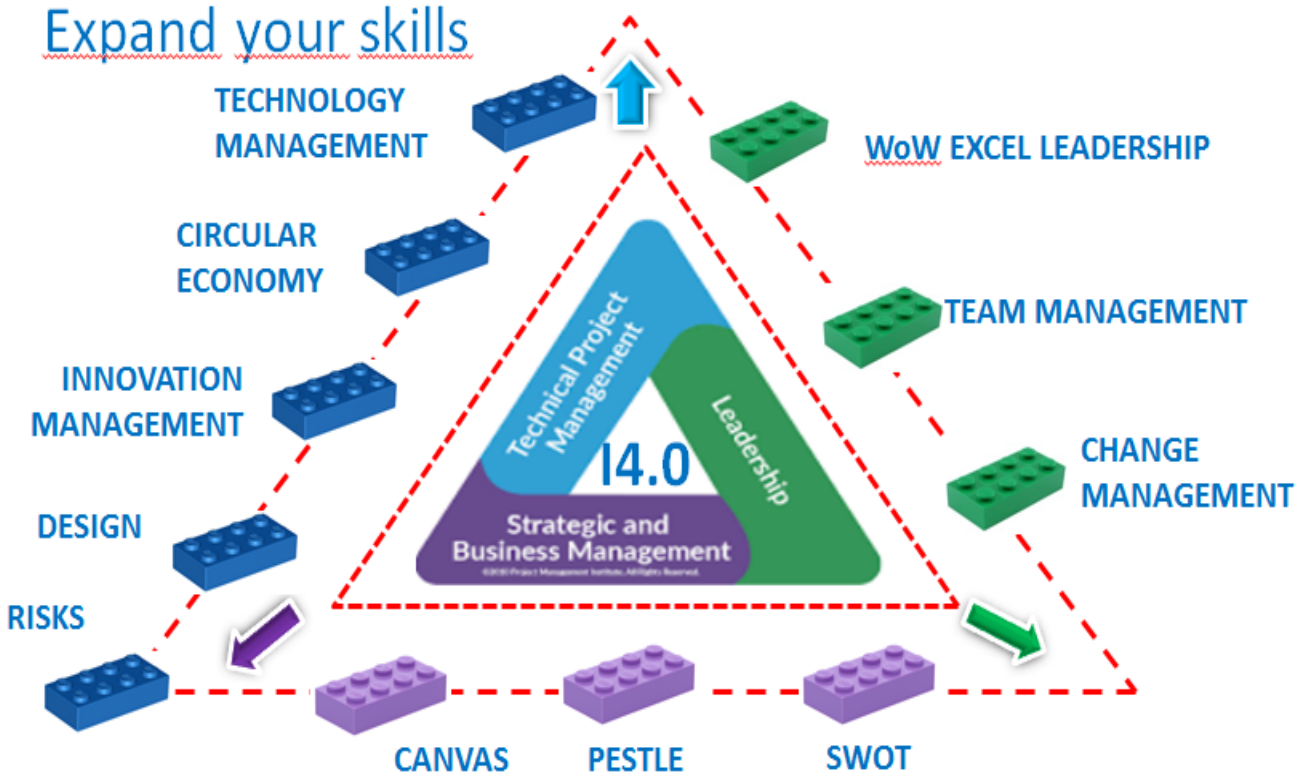
MANAGING RISK AND SECURITY IN ORGANIZATIONS

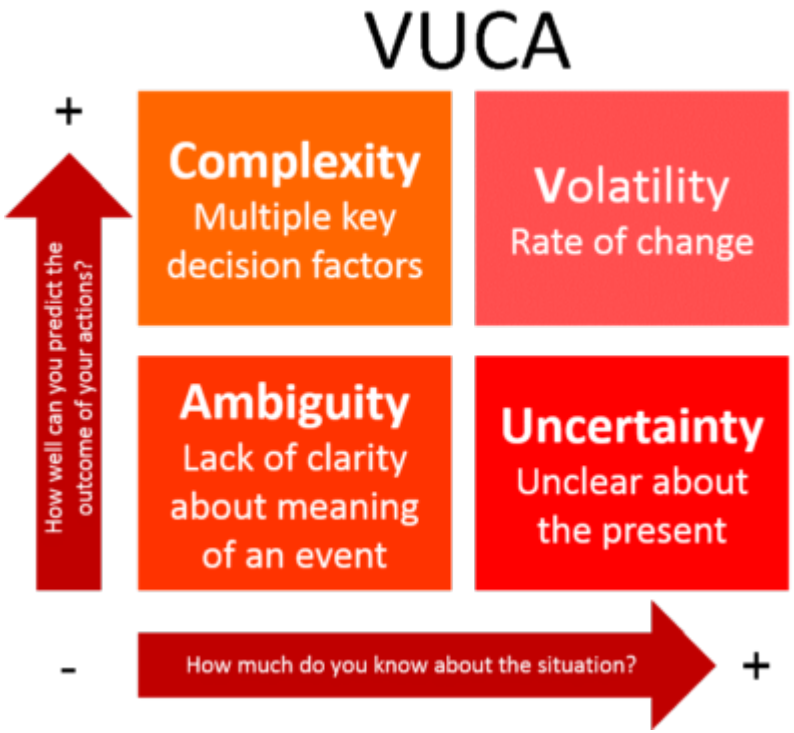


ADAPTING MANAGEMENT STILES IN ORGANIZATIONS



CONCLUSIONS





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Thank you!

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