

# IoT and Far Edge

## Future Directions for Smart Cities



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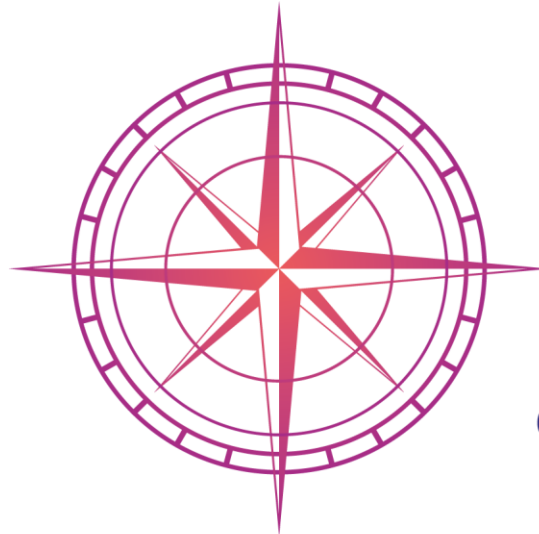
European Commission - DG CONNECT

# Digital Decade: a Compass and Common Targets

## Skills

**ICT Specialists:** 20 millions + Gender convergence

**Basic Digital Skills:** min 80% of population



## Government

**Key Public Services:** 100% online

**e-Health:** 100% availability medical records

**Digital Identity:** 80% citizens using digital ID

## Infrastructures

**Connectivity:** Gigabit for everyone, 5G everywhere

**Cutting edge Semiconductors:** double

EU share in global production

**Data – Edge & Cloud:** 10,000 climate

neutral highly secure edge nodes

**Computing:** first computer with quantum acceleration

## Business

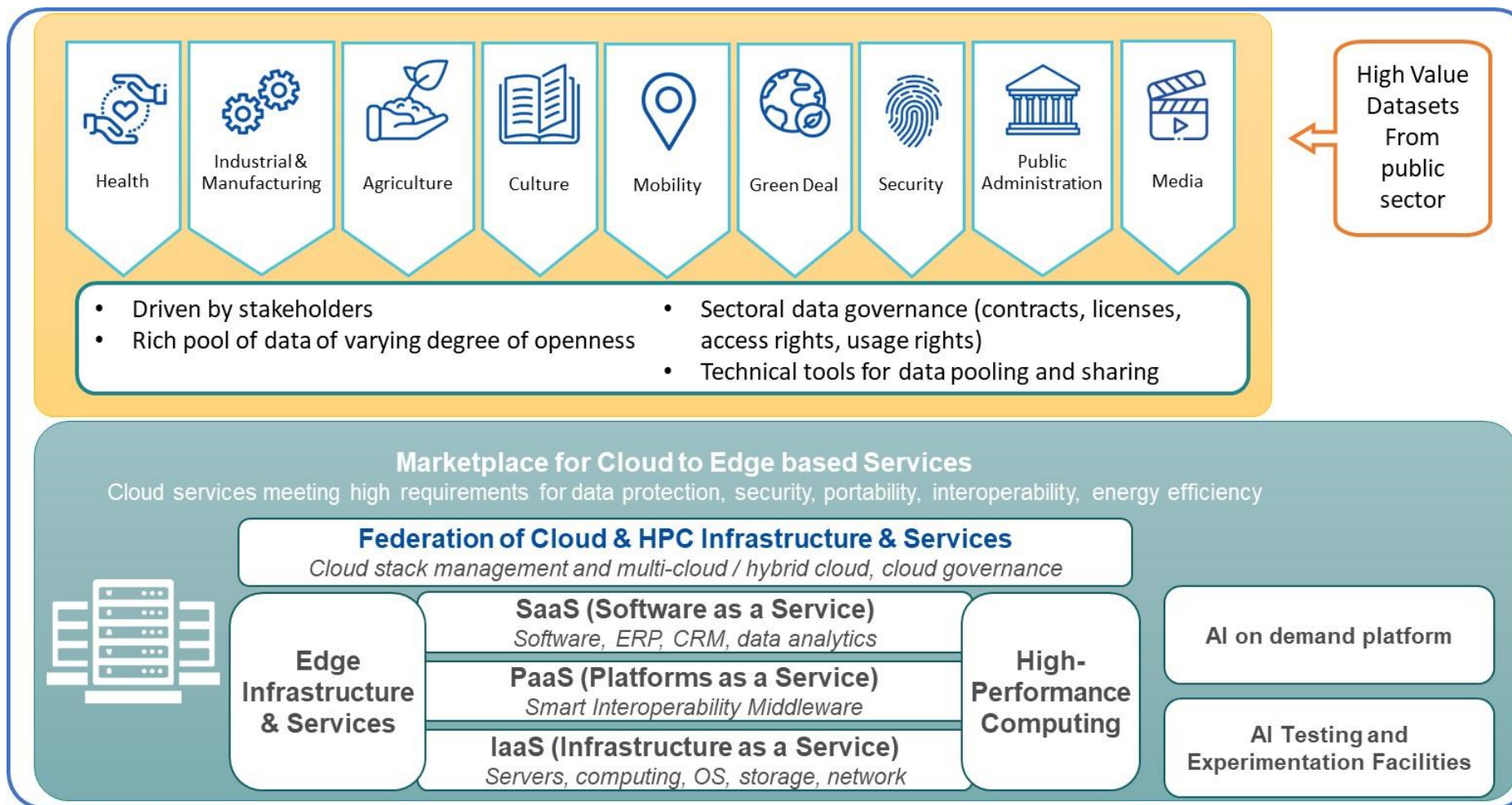
**Tech up-take:** 75% of EU companies using Cloud/AI/Big Data

**Innovators:** grow scale ups & finance to double EU Unicorns

**Late adopters:** more than 90% of European SMEs reach

at least a basic level of digital intensity

# Implementation: Cloud Federation, common European data spaces and AI



## EU Programmes:

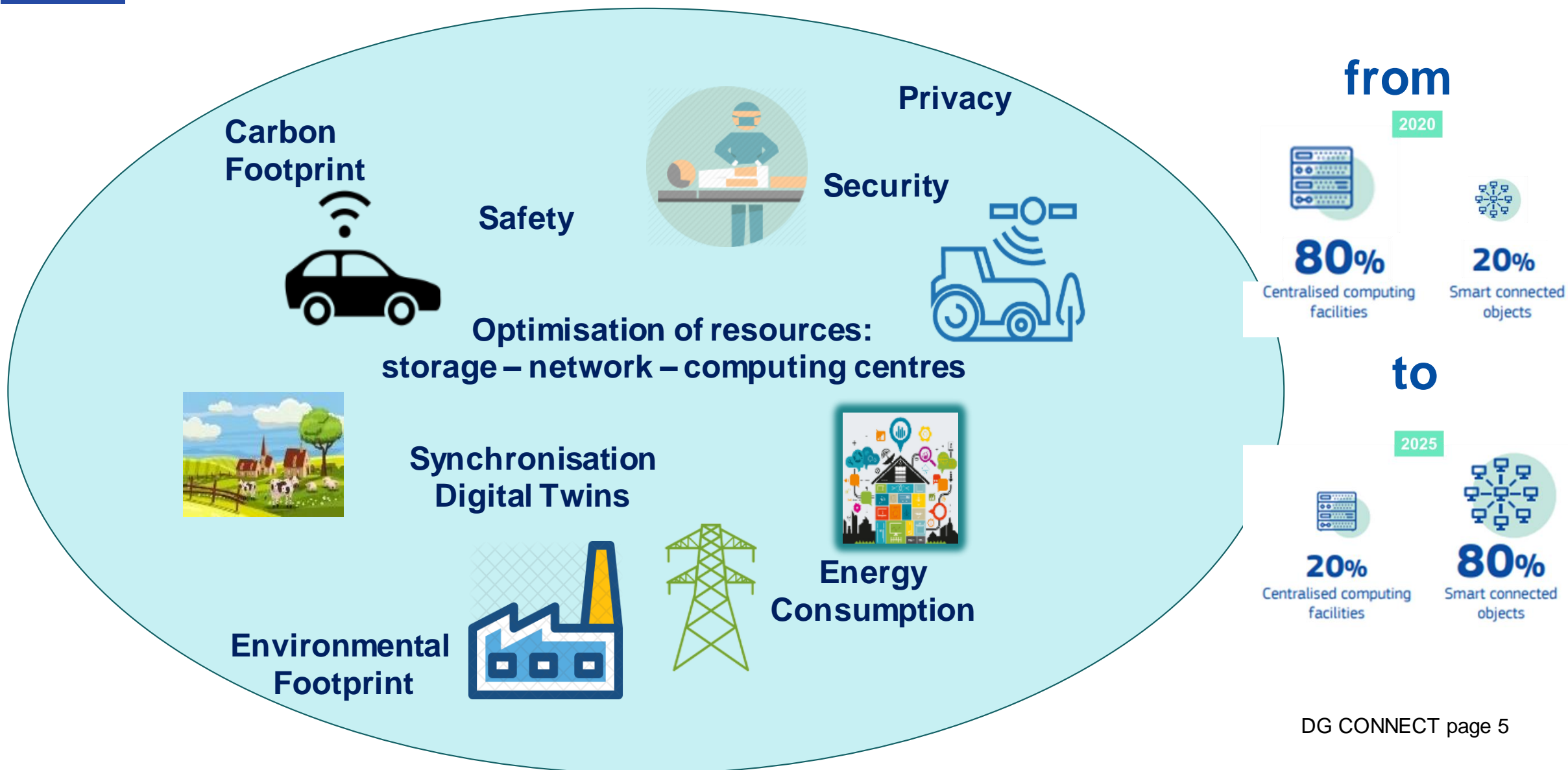
- Deployment support: DEP
- Infrastructure: CEF2
- RRF, IPCEIs

# A 5-yr innovation perspective: Building the Foundation for the next generation of Cloud-Edge-IoT Orchestration

- **Beyond cloud-edge service provisioning:**
  - *incorporating the power of the IoT* and its far edge devices and system in a compute continuum
  - bringing computing power to where the data is
  - (Artificial) Intelligence at the edge and far edge
  - enabling real-time processing: convergence IoT and cyber-physical systems
- Exploiting EU Strengths – application and system engineering competences
  - Cloud computing services: largely general purpose and application agnostic
  - Edge and Far Edge computing must be strongly customised towards the application
- **A new opportunity/challenge for European industry:**
  - next generation of IoT and edge computing
  - system integration and lifecycle management
  - next generation of industrial platforms and ecosystems



# Use cases underpinning the trend towards the edge and the far edge



# What the hack is Edge Computing ?

## Bringing edge computing to life

### With Edge Computing

4G Approx. latency 20 milliseconds

5G Approx. latency **11-12 milliseconds**



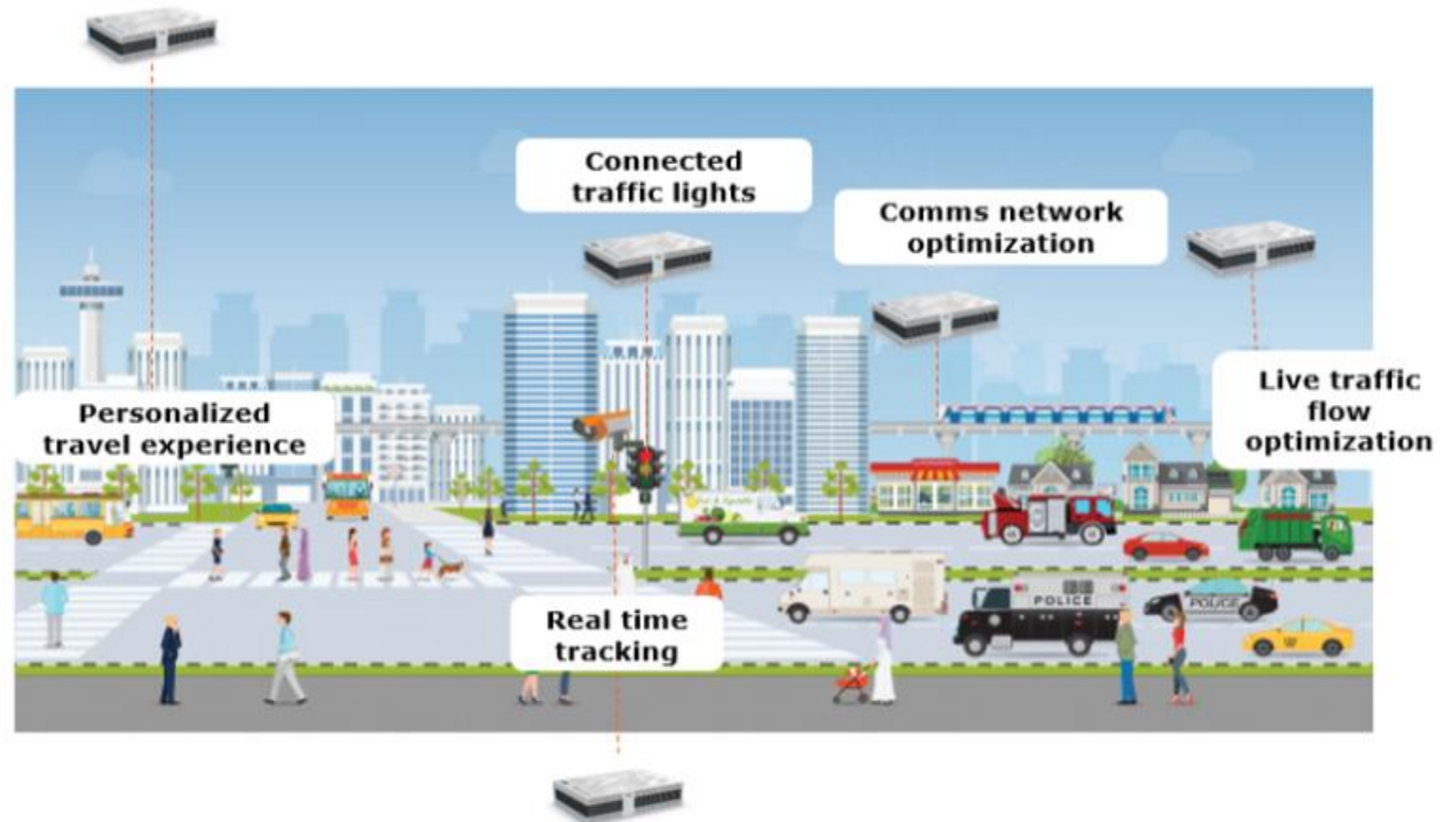
### Without Edge Computing

Approx. latency **80 – 170 milliseconds**



# Edge Computing in Smart City Context

Edge Computing is a massive revolution, enabling compute close to data sources, outside of datacenters

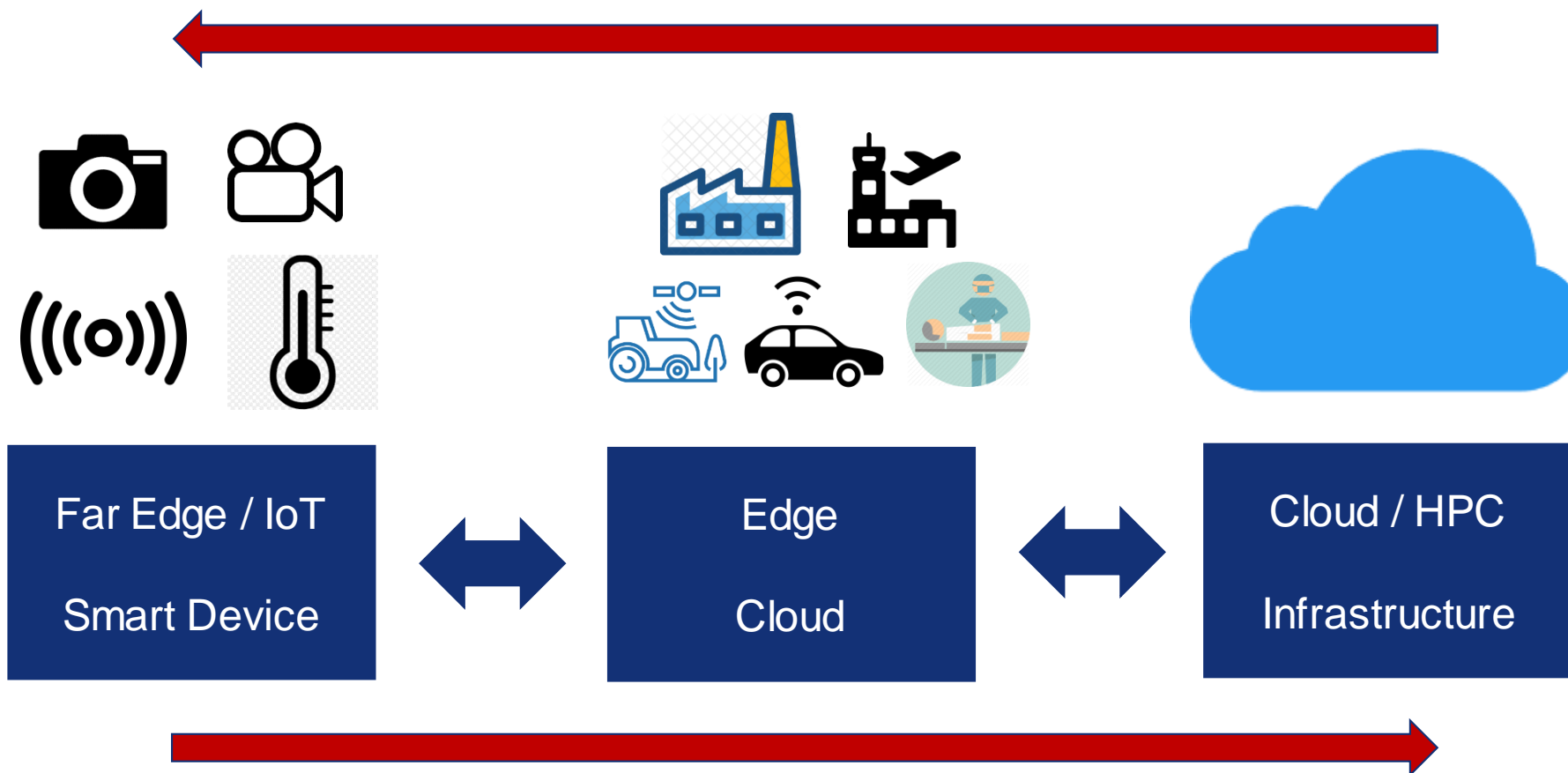


- **From GLOBAL to LOCAL** Optimization and Decision-Making

*Courtesy: Albert Seubers, ATOS*

# Paradigm Shift: Cloud – Edge - IoT

Trend/Paradigm Shift: from Cloud to Edge  
Bringing compute resources closer to the data



Federating far edge resources ad hoc via 5G  
to provide edge-cloud resources close to the edge



## From Cloud to Edge to IoT:

### ➤ **European platform for the Edge**

- Improve end-to-end response time
- Optimize operation of IoT systems and services
- Meta-Operating System for the Edge
- Reduce energy consumption
- Orchestration across device-edge-cloud



## **Pre-Publication WP2021-22**

<https://sciencebusiness.net/framework-programmes/news/horizon-europe-draft-work-programmes-leak-online>

# THANK YOU

## Useful links:

- **European Data Strategy:**

<https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy>

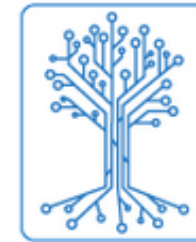
- **ARTEMIS White Paper: From IoT to SoS:**

<https://artemis-ia.eu/news/whitepaper-from-iot-to-sos.html>



- **GAIA-X Initiative:**

<https://www.data-infrastructure.eu/GAIA-X/>



GAIA-X

- **The Alliance AIOTI: IoT + Edge Computing Convergence**

<https://aioti.eu/news/>



- **NGIOT CSA Workshop EDGE on 22/04/20201:**

→ [www.NGiot.eu](http://www.NGiot.eu)

