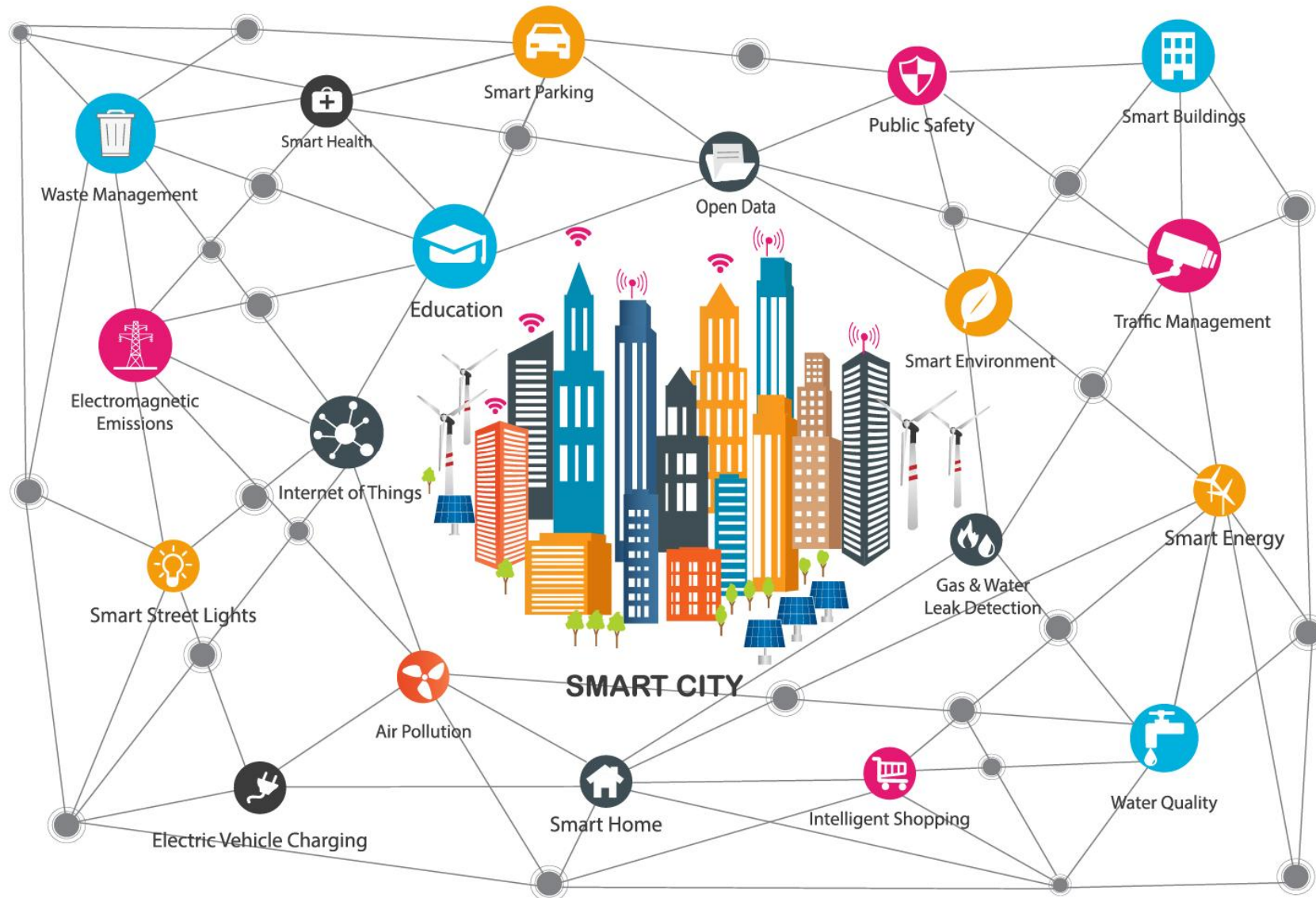




OULU

# 5G and beyond from City of Oulu point of view

Juha Ala-Mursula  
Executive Director





# Wireless Solutions Are Critical for Sustainable Development



Sustainability targets set by UN for 2030



## Vision for 2030

Our society is data-driven,  
enabled by near-instant,  
unlimited wireless connectivity.

6G will emerge around 2030 to satisfy the expectations not met with 5G, as well as, the new ones fusing AI inspired applications in every field of society with ubiquitous wireless connectivity.

2030



# Basic pillars enabling **future smart society**

## Flagship focuses on 5G & 6G

- **Now:** Utilize benefits of 5G
- **Next:** Develop 6G enablers

## Wireless intelligent edge

- Technology convergence
- Enablers for speed, experience, performance & security

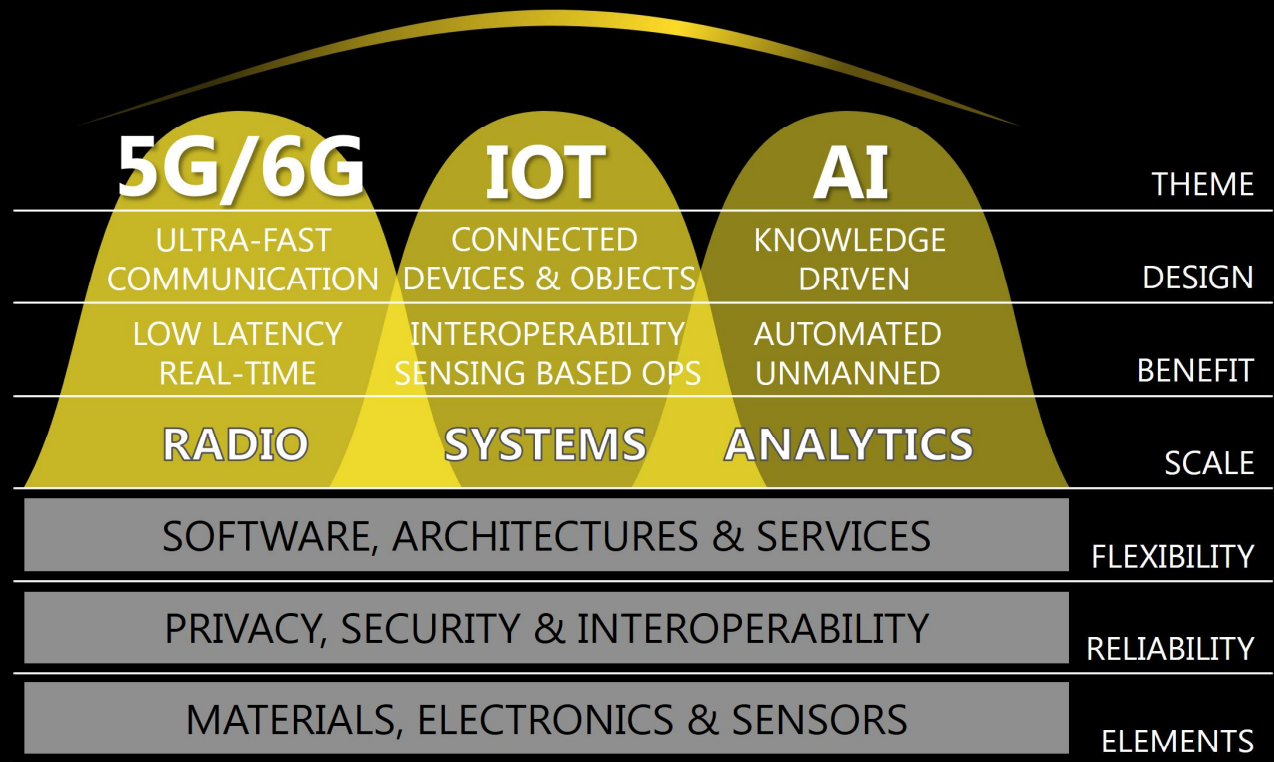
## Next gen requirements

- Real-time
- Sensing-based
- Distributed intelligence
- ..list goes on!

## WIRELESS INTELLIGENT EDGE

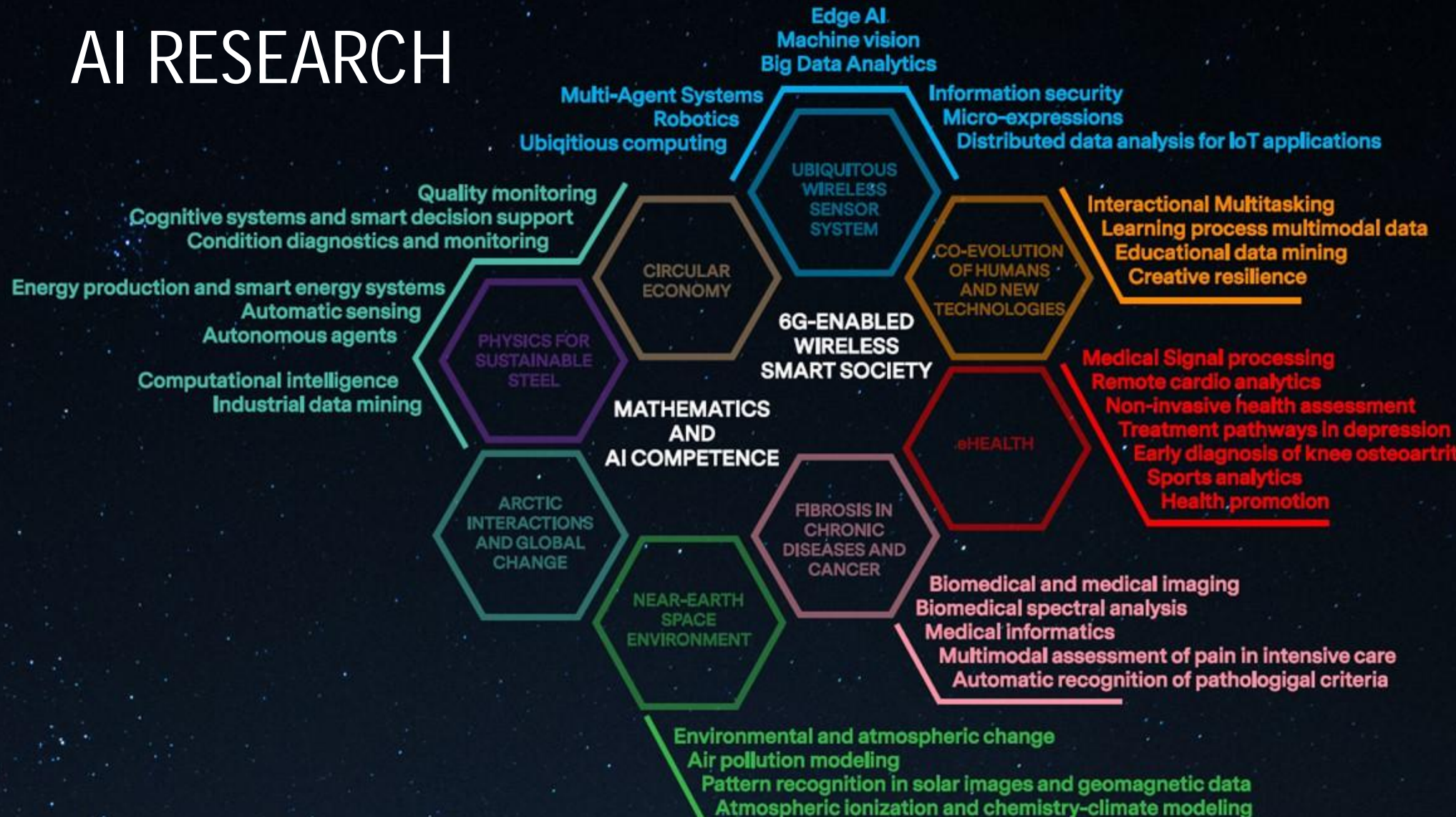
Differentiators

Enablers





# AI RESEARCH





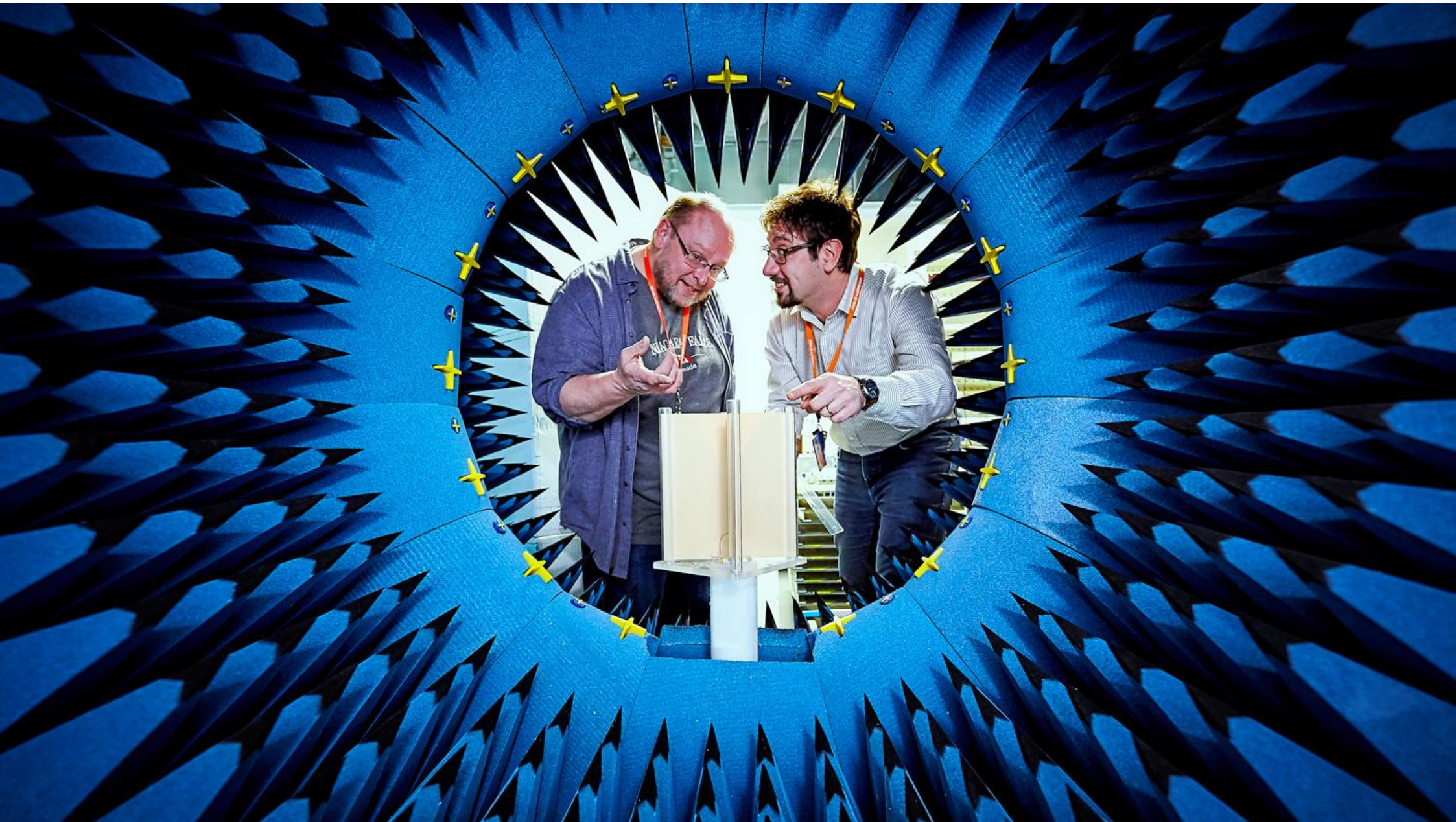


# CITY IoT

Oulun pilottikohteet

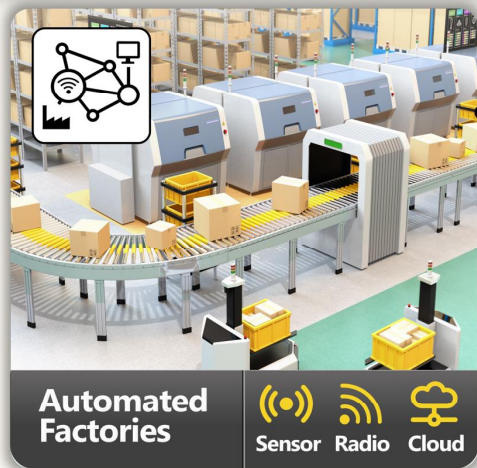
City is running IoT pilots in learning environment to ensure best possible conditions for learning.





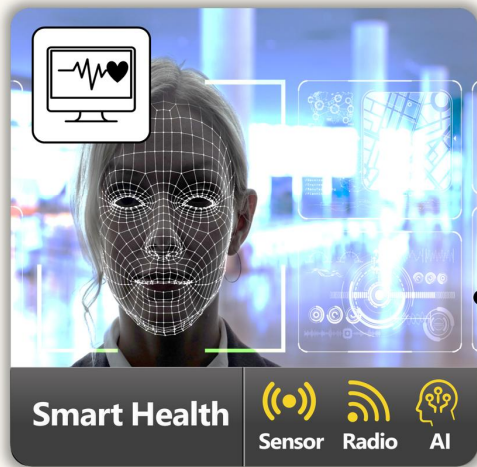


# Enabling next generation **business cases**



Requires

- Real-time data
- Edge processing
- Process AI



Requires

- Edge analytics
- Wireless sensing
- Machine learning

## 6G technologies **disrupt** businesses

**THz radios**

**Wireless AI**

**Cyber security**

**Augmented UX**

**Smart sensors**

**IoT systems**

**Local processing**

Requires

- Sensing system
- Machine vision
- Preference analytics



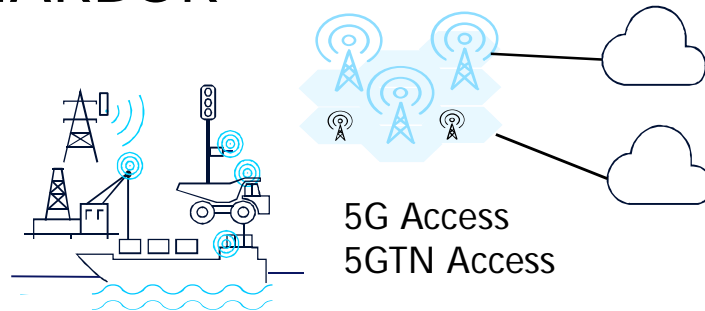
Requires

- Multi-radio
- Sensor mesh
- Swarm AI

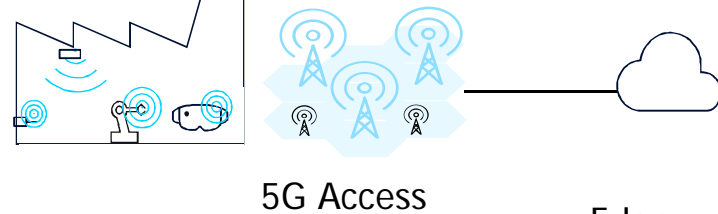


# Network Architecture in Port of Oulu

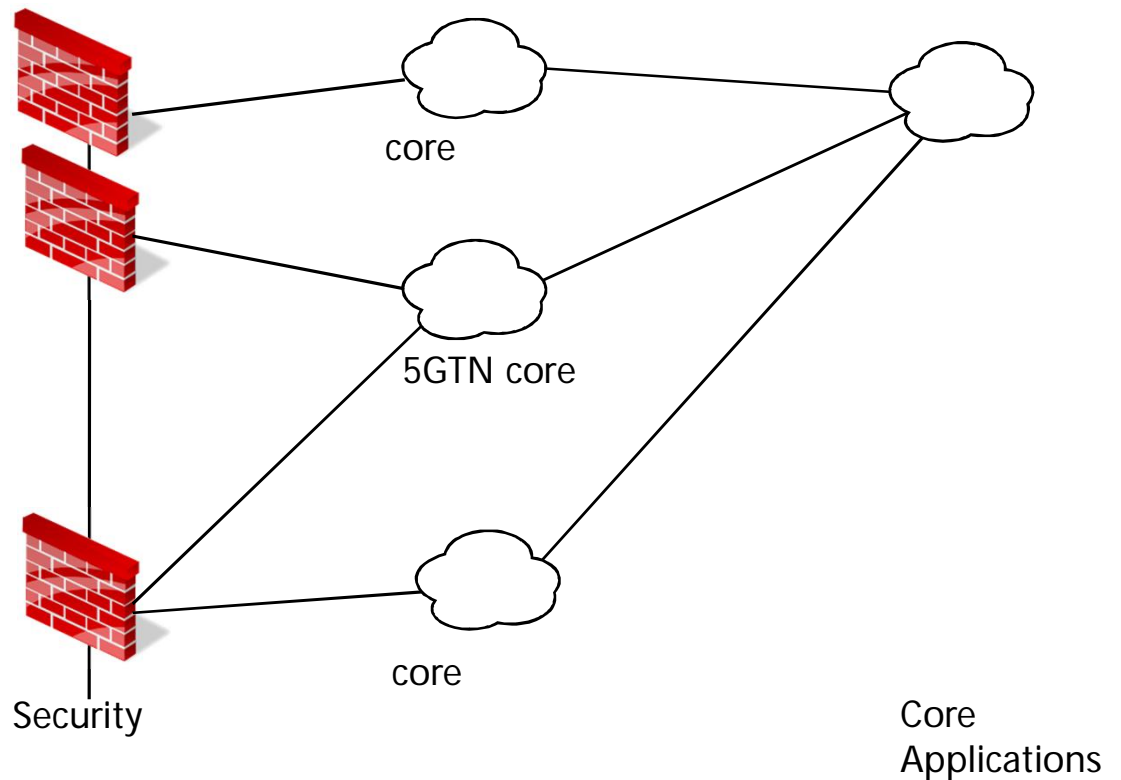
HARBOR



FACTORY



Edge applications







- Vehicles and asset tracking and locations
- Camera functions of cranes
  - reconization of containers
  - remote control
- Entrace of Port ( Gate functions)
  - reconization of vechiles and persons
  - reconization of containers
- Realtime circumstance
  - real time ice conditions (drone)
  - maintenance need on passways
- Cargo Handling
  - online cargo tracking in port area
  - virtual storage locations in the port area.



OULUHEALTH  
FOCUS AREAS:  
medical imaging  
robotics  
printed electronics  
artificial intelligence  
5G/6G

### **HOSPITALS AND HOME CARE**

- intelligent analysis of symptoms
- personalized care
- virtual hospitals and health centers

### **DIGITISATION**

- mHealth solutions, wirelessness, IoT, 5G-technology, virtualization, sensors, data analysis, wearable technology, data-based decision making, robotics

### **PREVENTION OF DISEASE**

- identification of risks
- genomic information
- early diagnosis of disease

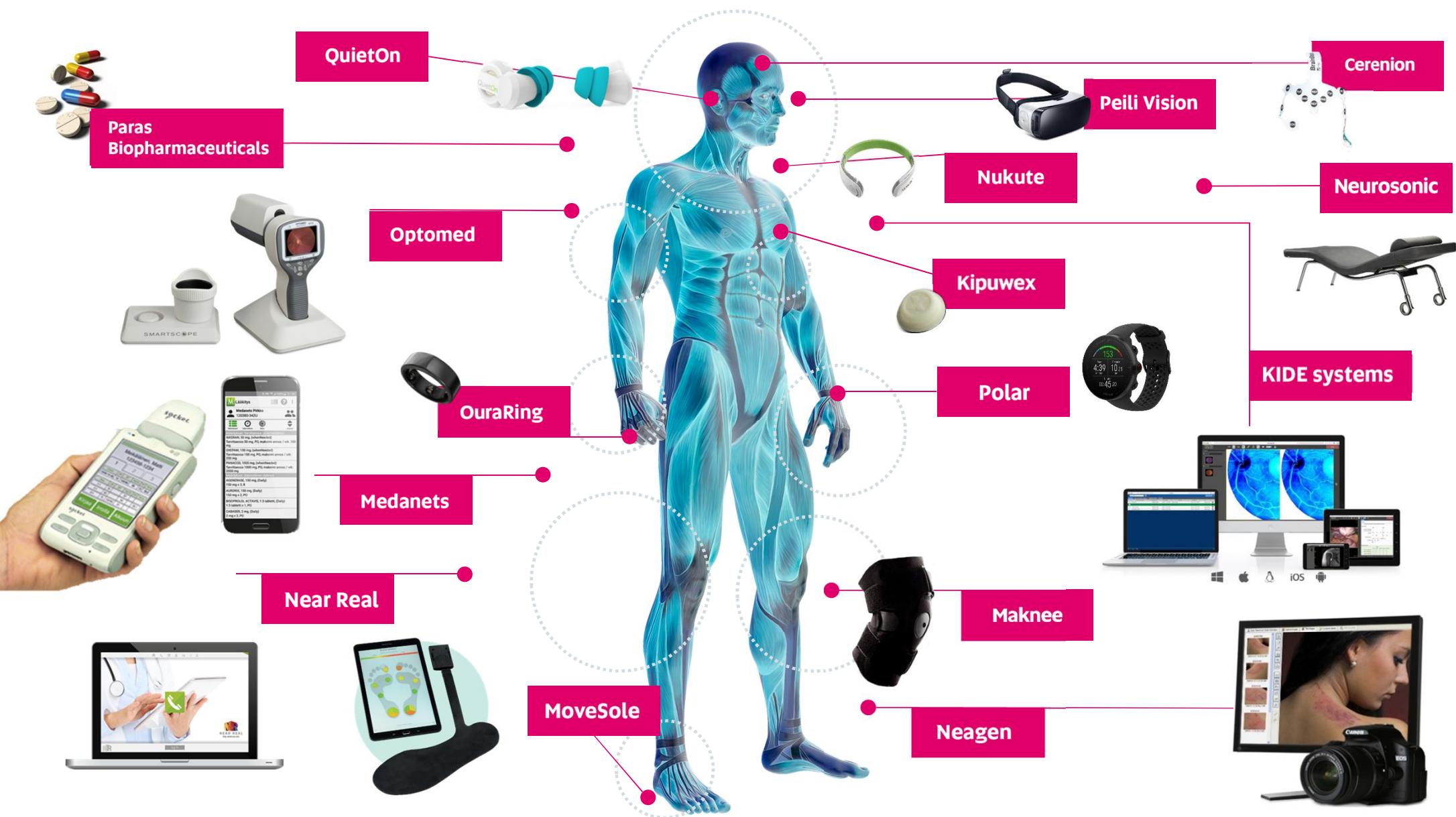
### **INDIVIDUAL RESPONSIBILITY**

- My data
- self-measurements
- self-diagnosis
- monitoring
- remote communication

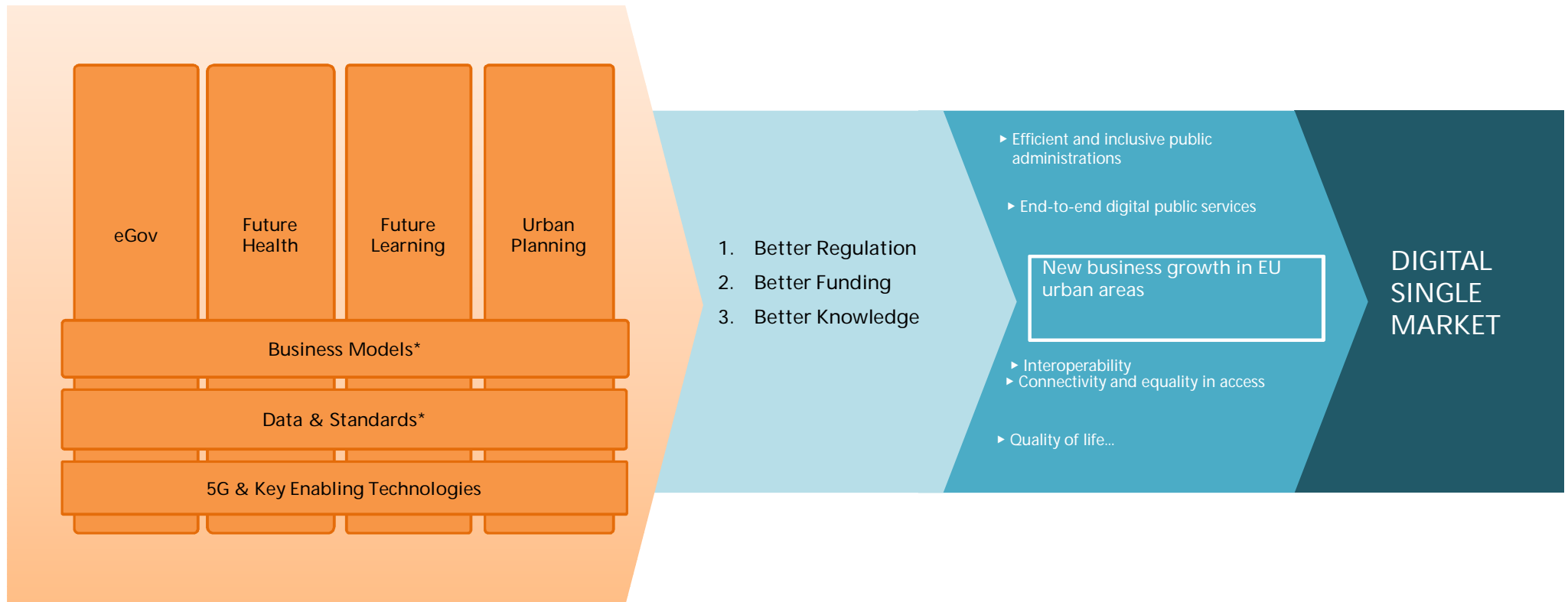
**5G**

**IT'S NOT ONLY  
ABOUT THE  
TECHNOLOGY**





# EU URBAN AGENDA Digital Transition -themes







# Conclusions

- 5G+ is the base (backbone) of development of future society. Most of new business ideas are 5G/6G enabled.
- A lot of spin off companies are expected to be established during the research and development phase.
- Digitalization enables:
  - new services (b2b, b2c)
  - improvement of current services to citizens
  - key driver of new job creation, renewal of economic life



Oulu Capital  
of Northern  
Scandinavia



# Thank You

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