5G VIIMA

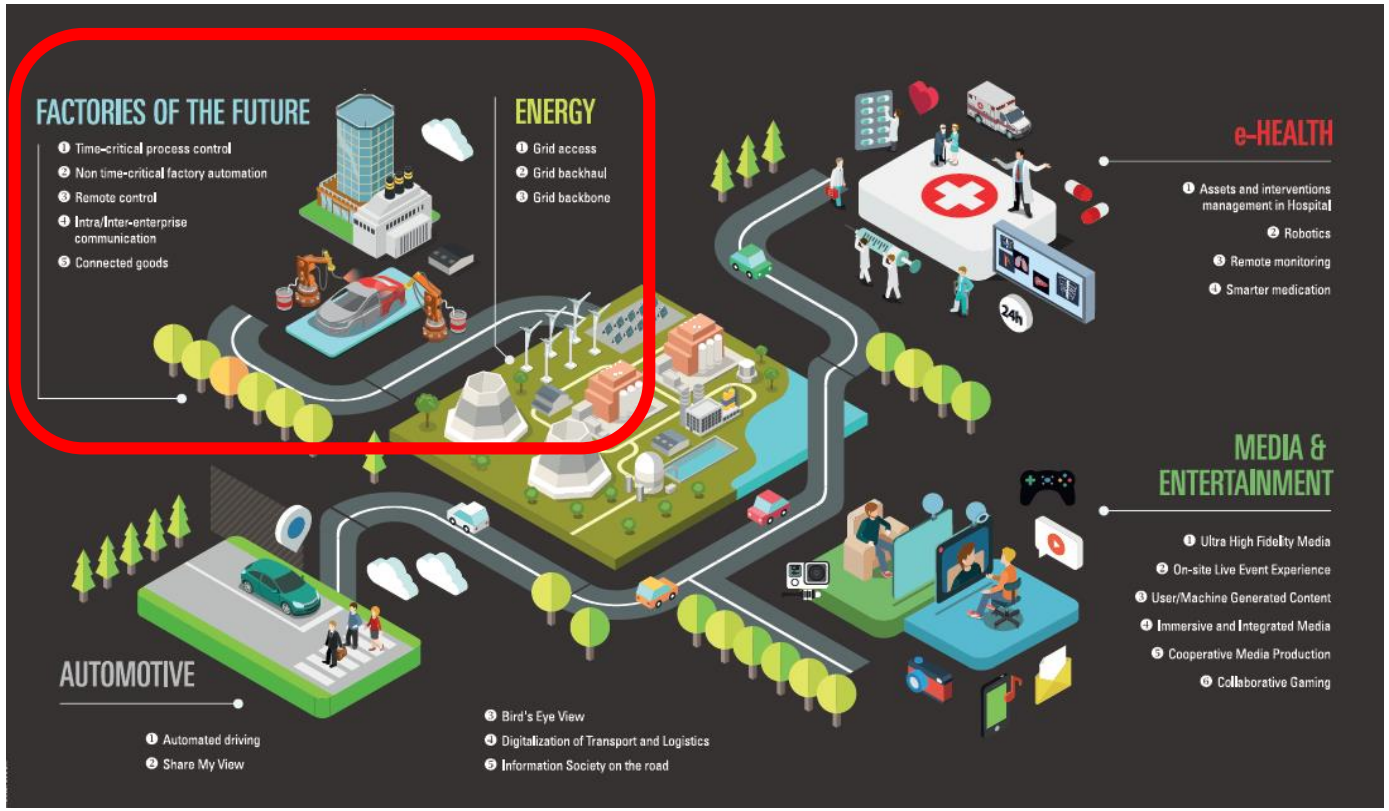
5G FOR INDUSTRY

Content

- Overview
- Research Topics
- Opportunities
- Ongoing experiment examples

Key Numbers and Main Idea

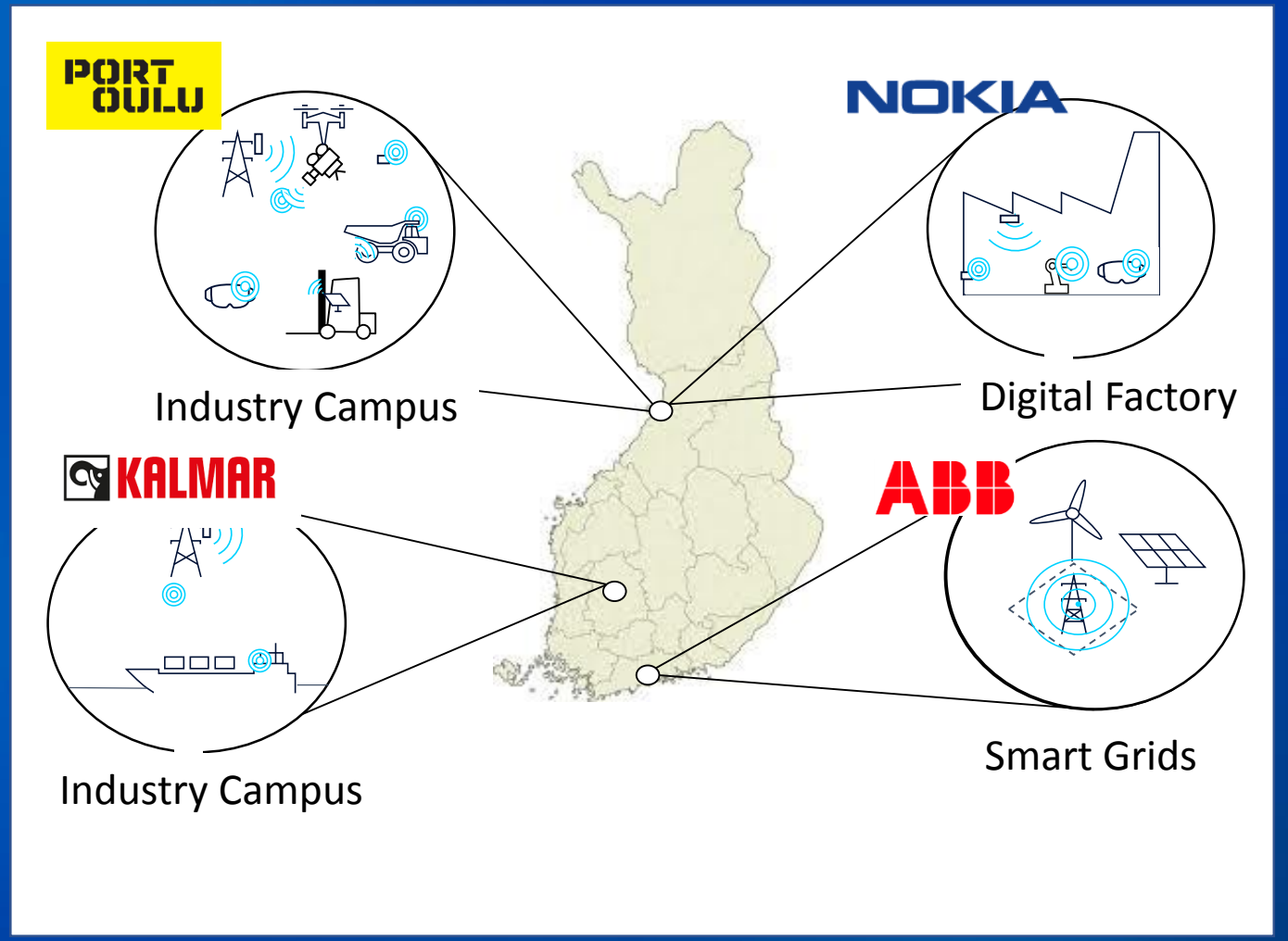
- 2y project with total 16M€ budget: 6/10M€ academy / industry.
- Business Finland funded.
- 7 academic, 21 industry parties, 3 public sector organizations
- Addressing global view about highest 5G business potential on new verticals
- Key Focus:
  - Industry 4.0 relevant 5G technologies and services
  - Practical experiments both indoors and outdoors



EC: 5G empowering vertical industries

New Assets and Practical Experiments

- Investigating and exploring 5G technologies bringing value to Industry sector
- Enabling wireless connectivity to existing Industrial products
- Exploring new ways of using data
- Running Practical experiments in a factory, a controlled semi-open outdoor/indoor industry campus and smart energy grids



Involved Partners

Industry (21)

KALMAR
ABB
UROS
FINWE
MEDIATEK
NOKIA
FinCloud.tv
Attracs
VALOSSA
tieto
OY HERMAN Andersson OULU SINCE 1902
FIN-TERPUU
Valmet
SOLITA
augumenta
KAITOTEK
STRONG WOOD POLKKY
Telia
REALMAX
Efora
PORT OULU

Academic (7)

UNIVERSITY OF OULU
Aalto-yliopisto Teknillinen korkeakoulu
VTT
Tampere University
OAMK OULUN AMMATTIKORKEAKOULU
TURKU AMK
Centria AMMATTIKORKEAKOULU

Public Sector (3)

BUSINESS OULU
BUSINESS FINLAND
TRAFICOM Liikenne- ja viestintävirasto

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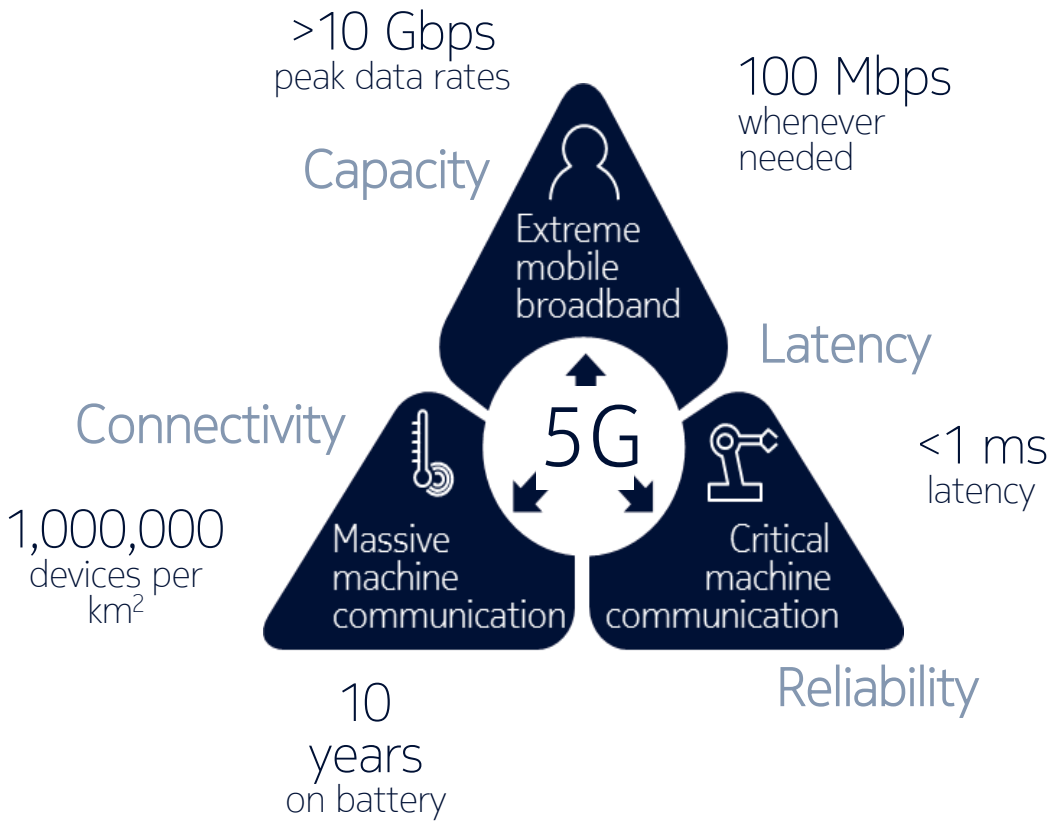
- Business Ecosystem analysis

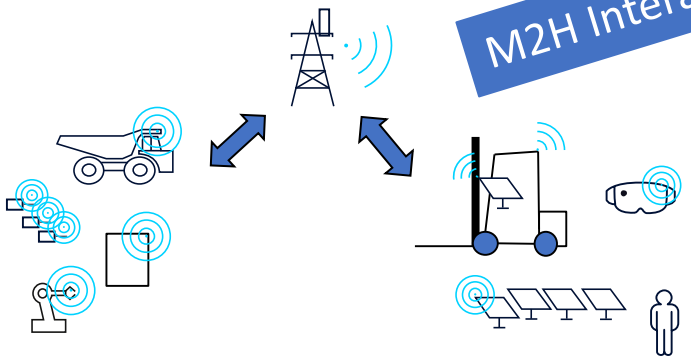
5G Network Research

- Live 5G & 4G network at experiment locations. Interaction between local and wide-area network.
- 5G Modems integrated to industry devices/products
- Run-time cloud environment at network edge for services and security
- Network reliability evolution for industry. Ultra-reliable, low-latency communication (URLLC)
- Guaranteed quality per network user or service with network slicing
- Industrial Ethernet over 5G. Wireless time-sensitive network (TSN)
- Accurate (<1m) indoor and outdoor positioning



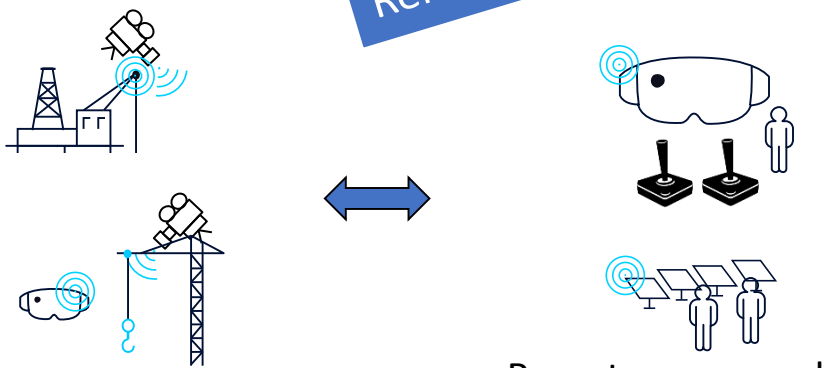
Exploring Wireless Industry Applications

M2H Interaction



Advanced Video Services

Remote control



Autonomous vehicles

Smart Energy Grids - Security, protection AI/ML based ctrl

Analyzing Business Value

- Deep-dives for trial environments
  - Use case analysis for participating stakeholders
  - Modelling the techno-economical environment
  - Impacting to legislation, regulation and policies

→ roles, value chains, total value, example business models

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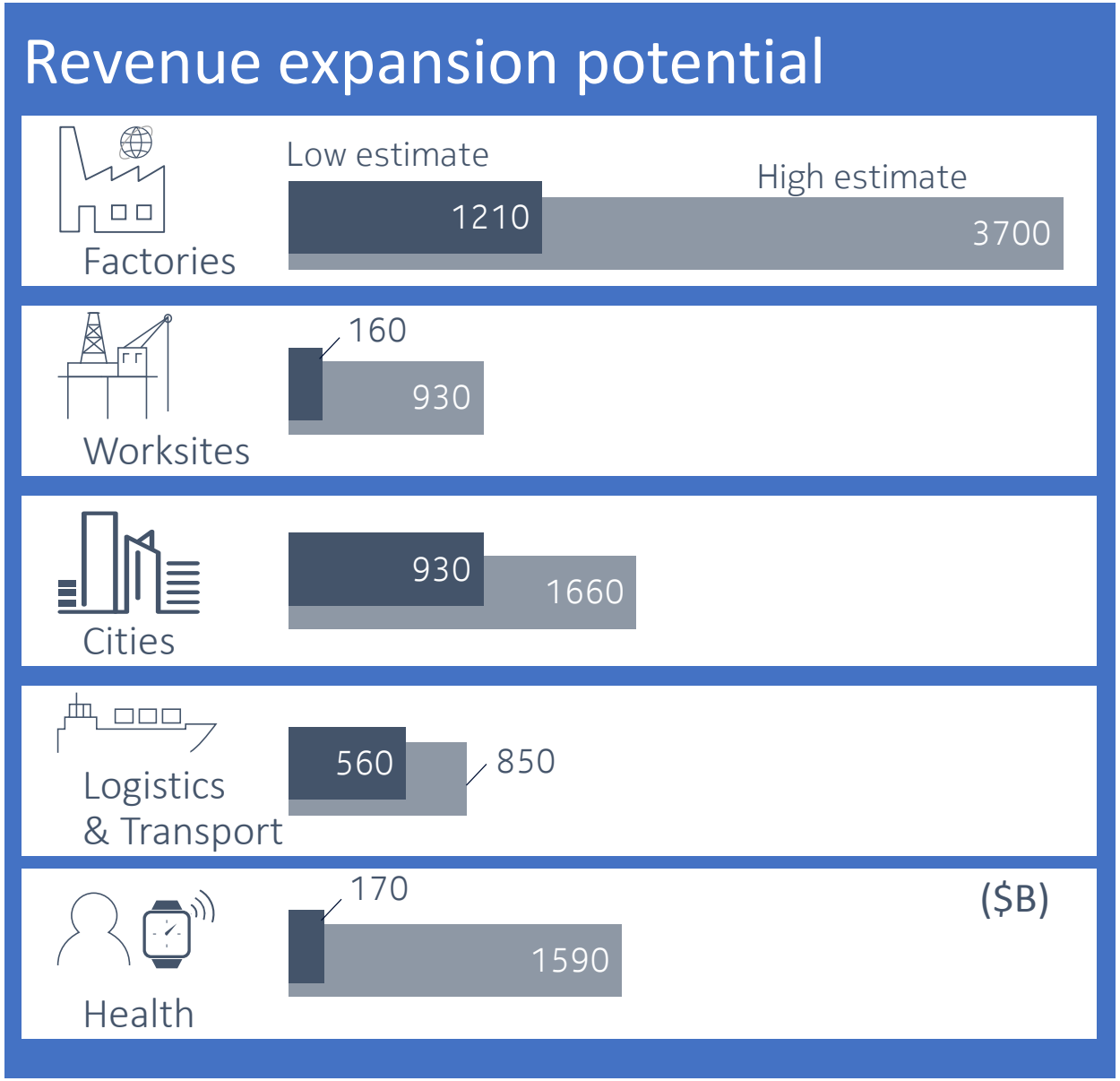
Why Smart Industry ?

Digitalization market on physical industries offer significant business potential by 2025…..

….with factories / manufacturing industry on top



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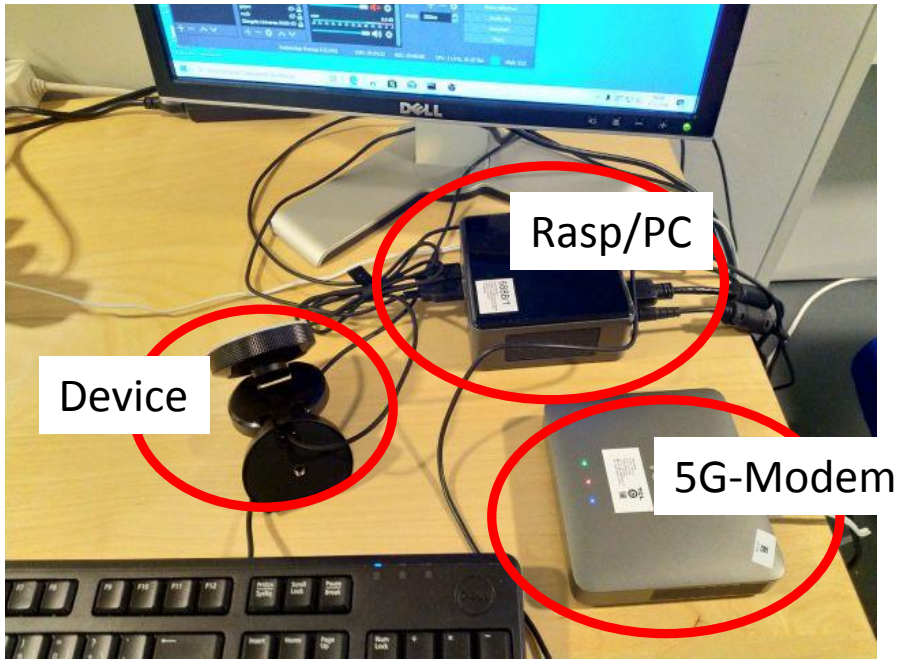
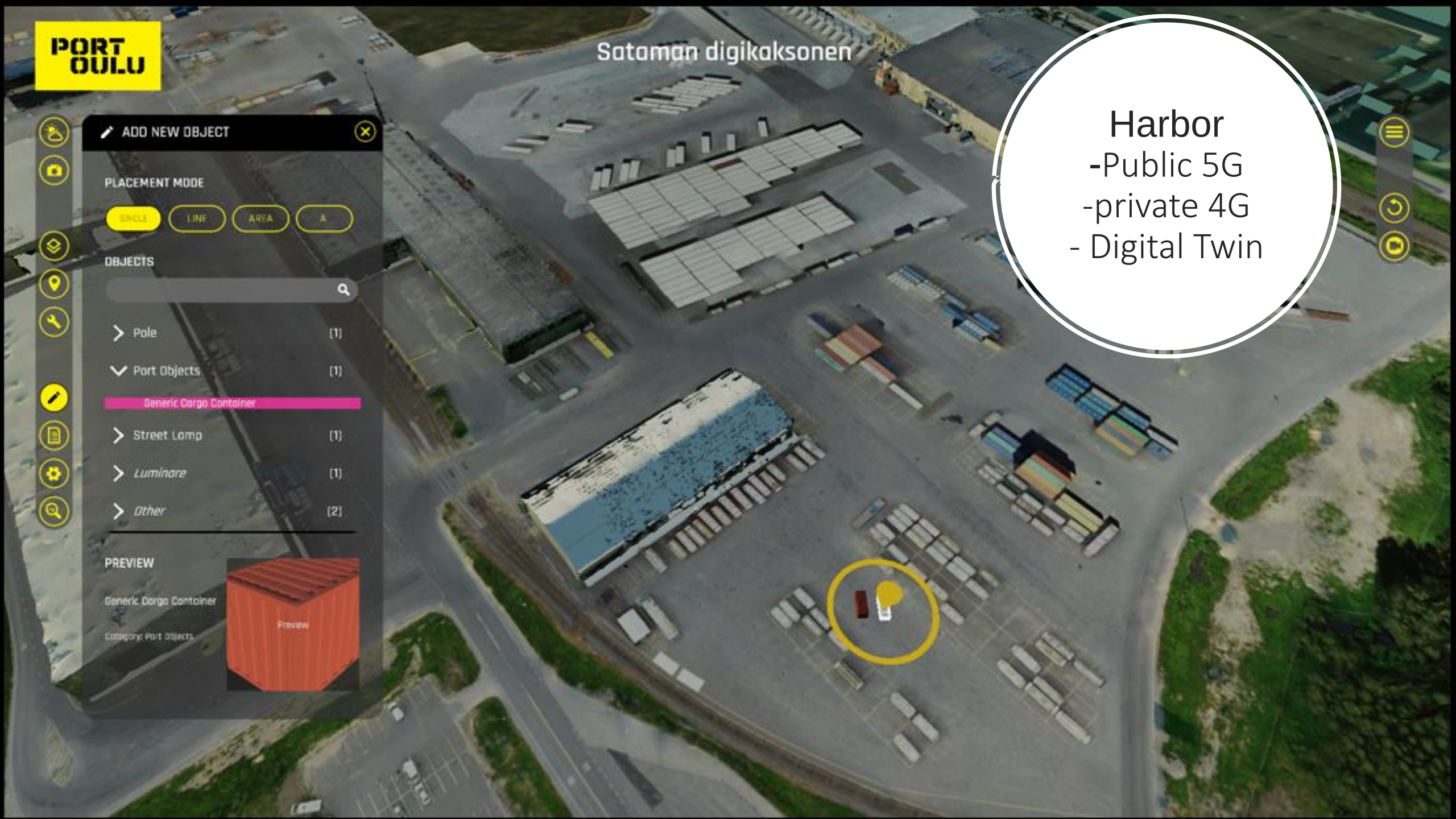
Neutral Reference Environment

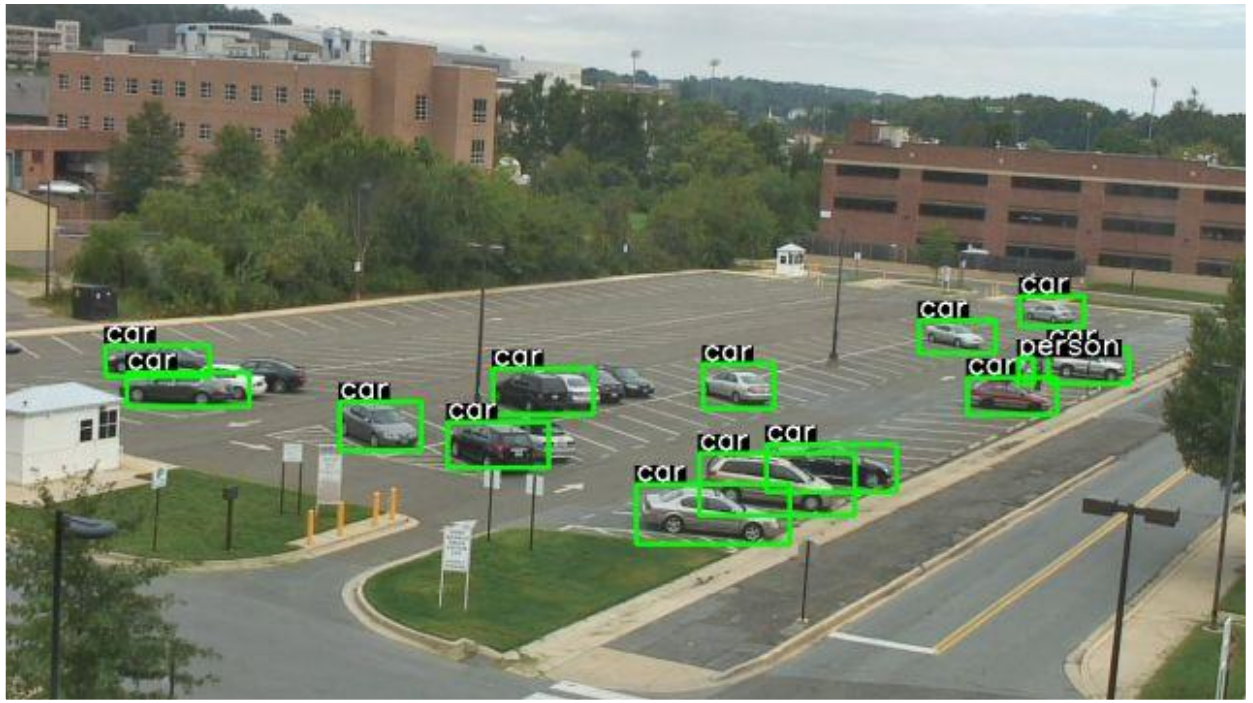
- Live 5G test network
- Smartphones / other 5G devices
- Products converted to mobile devices with 5G-modem
- Run-time env for services




PORT OULU
Sataman digikaksonen
ADD NEW OBJECT
PLACEMENT MODE
SINGLE
LINE
AREA
A
OBJECTS
Pole [1]
Port Objects [1]
Generic Cargo Container
Street Lamp [1]
Luminare [1]
Other [2]
PREVIEW
Generic Cargo Container
Category: Port Objects
Preview
Harbor
-Public 5G
-private 4G
- Digital Twin

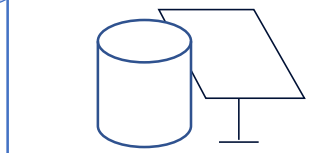
Video analytics

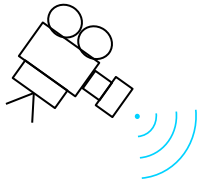
- Object recognition in industrial env: person, car, truck, boat, train
- Services:
  - Safety / Security
  - Cargo detection/identification
  - Damage assessment, risky materials



Monitoring/Analyzing Material buffers

5G





Material 1 Material 2 Material 3 Material 4

- Investigate wider use of wireless video applications in industry environment
- Demonstrate 5G use
- Develop services for industry

Solution for Securing Fuel Logistics

- Fuel truck filling followed by video surveillance
- Object recognition from video and comparison with loading plan.
- Immediate quality feedback to personnel

FINWE

FinCloud.tv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5G FOR INDUSTRY
Funded by BUSINESS FINLAND