

Unleashing the potential of 5G

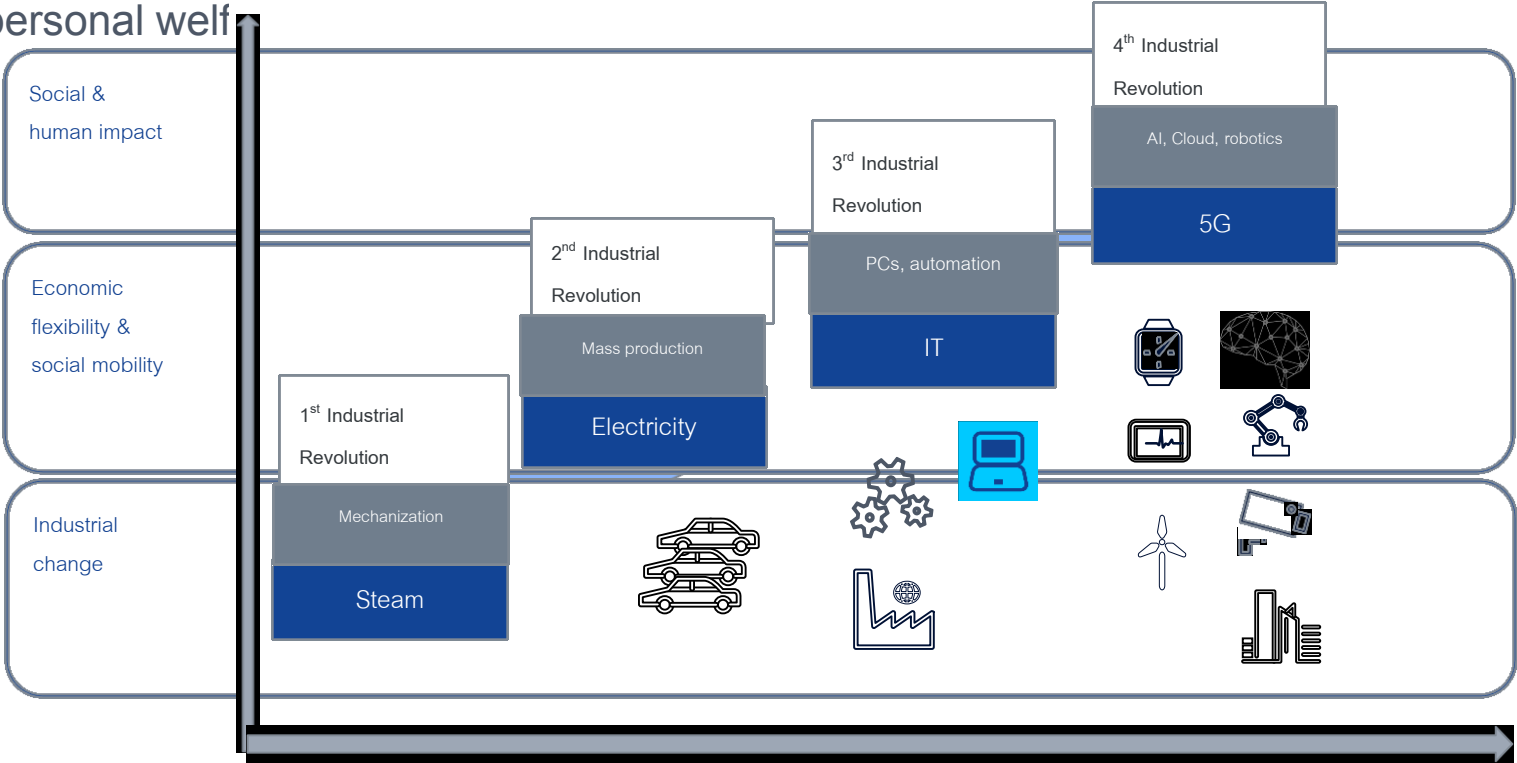
NOKIA

Guillaume Mascot

Head of Government Relations APJ

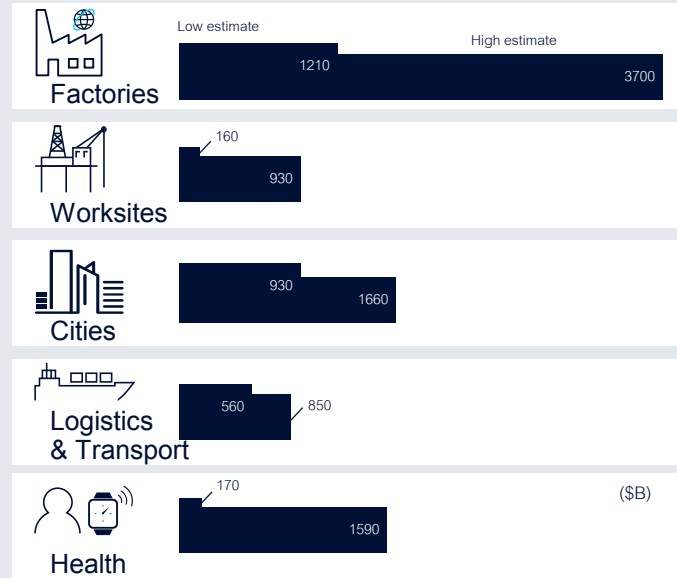
Nokia vision of the 5G era - powering up the 4th Industrial Revolution

Each revolution has a different enabler improving industry and processes. The 4th IR, powered by 5G, will drive social and personal well-being.



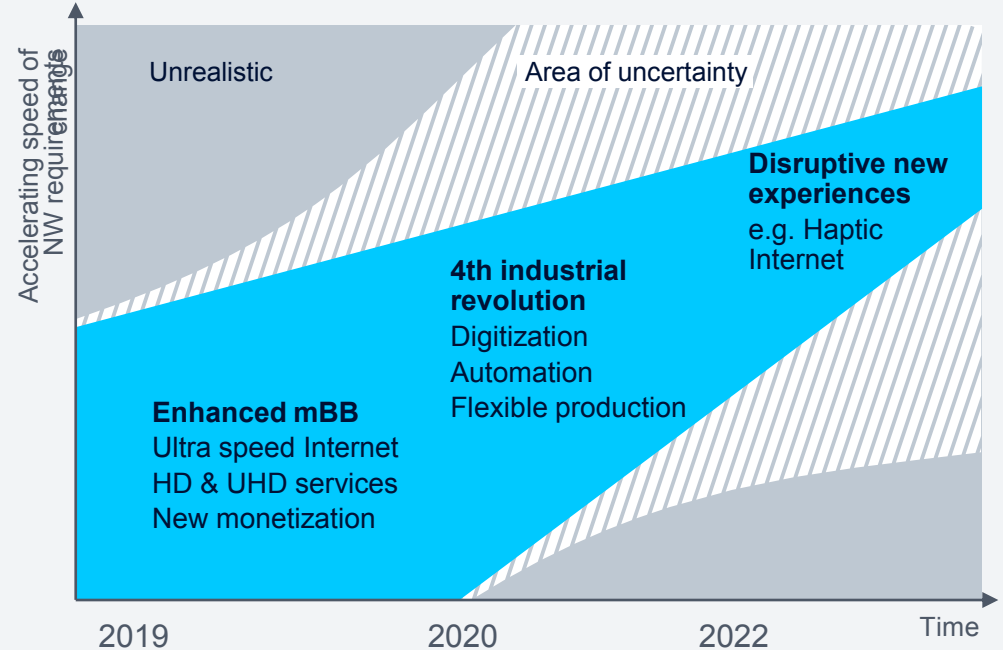
The quest for new economic value

New DSP markets offer significant revenue expansion



Estimated 2025 value creation potential of the IoT
- McKinsey Global Institute

...be prepared for the obvious and the uncertain



New user demands – with extremely diverse requirements

5G is more than 1 generation ahead of LTE



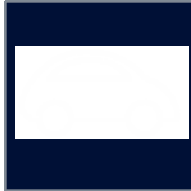
Devices
1.5 GB/day



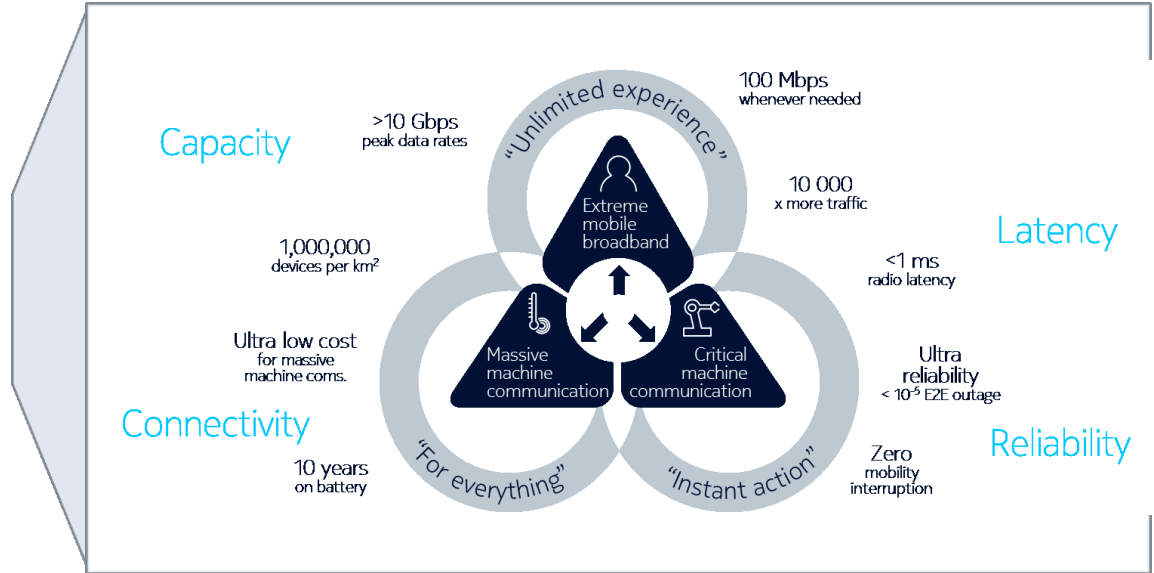
Smart Factories
1 PB/day



Billions of sensors
connected



Autonomous driving
1ms latency



Design and architecture principles:

flexible | scalable | automated | cloud native
software centric | dynamic network slicing

5G Future X - breakthrough network performance and cost reduction

Quantum leap in radio economics

3x increase of cell site throughput, slashing power costs

Embedding AI into the architecture

Zero-touch network optimization in ns tact

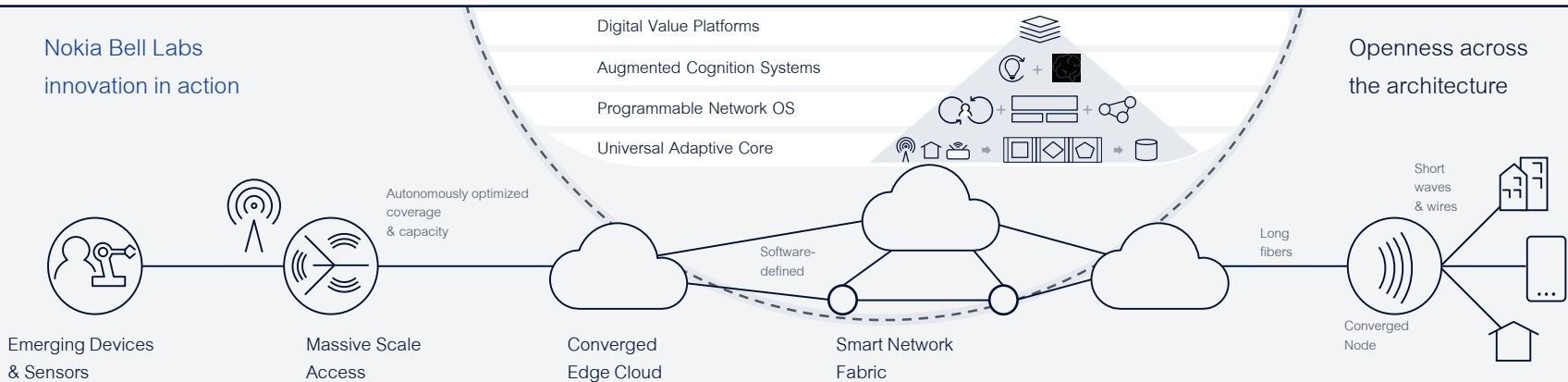
Cloud-native architecture

Web-scale capacity and programmability

Fully automated network slicing

30% TCO savings

Nokia Bell Labs
innovation in action



5G early market use cases

Nokia study unveils high value use cases and their business models

Separate use cases

e.g. homes, events, industry, healthcare,

Highway use cases

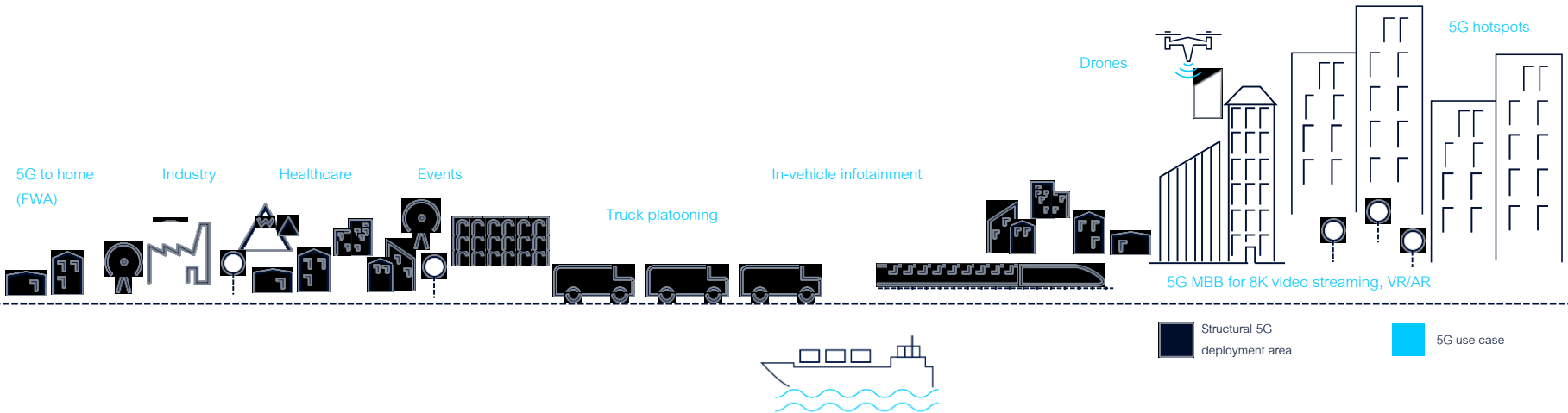
e.g. in-vehicle infotainment, truck platooning

Public transport use cases

e.g. train & boat infotainment

Dense city area use cases

e.g. Mobile broadband; in-vehicle infotainment; 5G hotspots

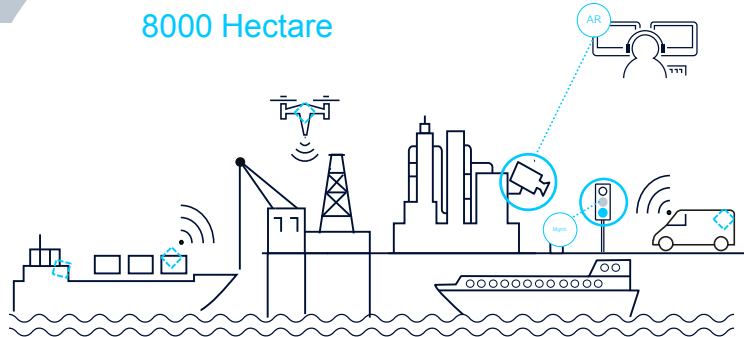


Hamburg Port: first 5G network slicing trial in large industrial environment

Trial

5G Smart Sea Port

8000 Hectare



Focus on 3 use cases with immediate results

Operations support at water-gates or construction sites

Improved harbor operations, experience and security

Traffic light management: 5G slicing to connect to mgmt.

Better traffic flow

Mobile sensors

Improved pollution control

Nokia AirScale radio access and cloud packet core

Slice-aware scheduler & core network to enable slices

Life cycle management for network slices

5MHz FDD Carrier at 713/768, i.e., UL@713-723 / DL@768-778

Challenges by 2025

18 Mio containers/year

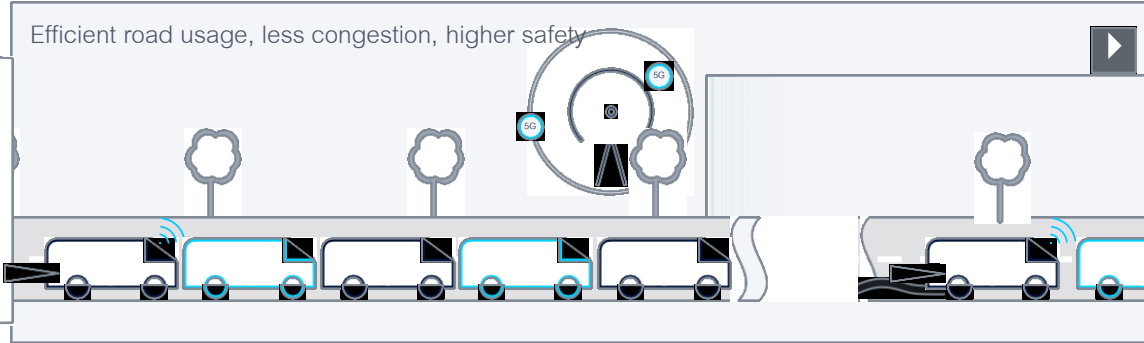
Several 10K trucks/day

Self driving/flying vehicles (public, private, enterprise)

100,000+ sensors

5G truck platooning – automatically controlled convoys

Cutting costs of transportation, increasing safety



Ultra-low latency

<1ms to avoid oscillation at tightly-knit convoy

Enabling platoons >4

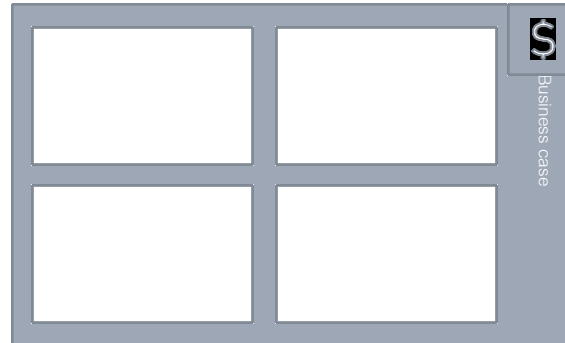
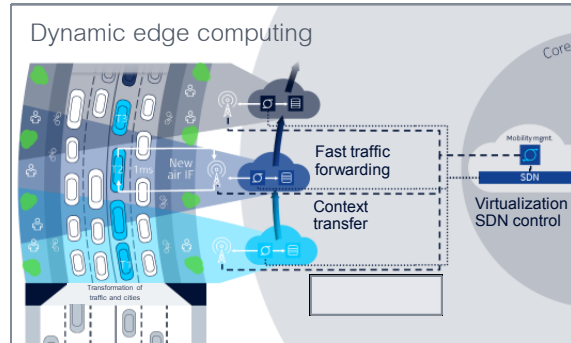
not feasible with truck-to-truck

Inherent system security

by dedicated network slices

5G

Advantage



Benefits

4th Industrial Revolution – Opportunities and Challenges

100 Million global knowledge workers could be affected by robotic process automation by 2025. (KPMG)

> 30% increase in productivity in the United States in 2028-2033 (Bell Labs)

AI could increase the annual growth rate of Finland by **2** points by 2035 (Accenture)

5-10% of labor would be displaced by intelligent automation, and new job creation will offset losses. (OECD)

60% of children entering school today will work in jobs that do not yet exist. (The World Economic Forum)

By 2020 more than **50** billion things will be connected to the internet.

Recommendations to prepare society for the Fourth Industrial Revolution

Investments in ICT infrastructure

Understanding evolution in skill demand

The importance of education

New employer-employee relationships

Socio-economic structures

The image features the word "NOKIA" in a large, bold, white, sans-serif font centered horizontally. The background is a blurred, blue-tinted image of a computer keyboard, with the keys appearing as soft, out-of-focus shapes. The overall aesthetic is clean and modern, suggesting a focus on technology and digital communication.

NOKIA

5G industry experience – enabling industry 4.0

Resilient, secure low-latency communication

