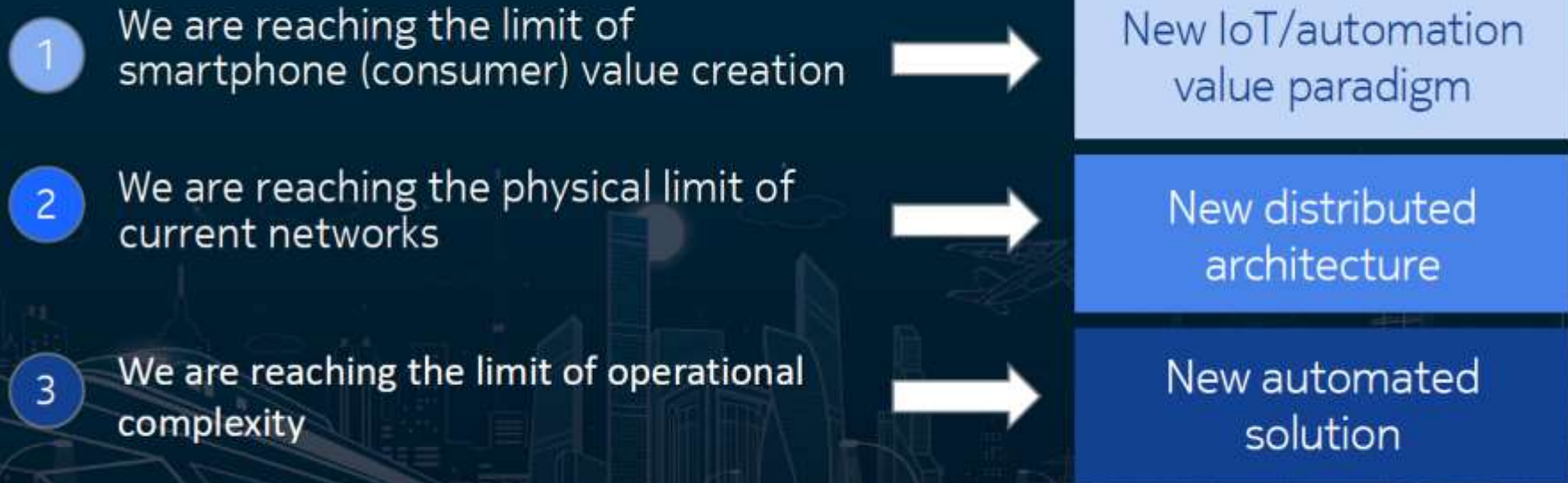
A woman is shown in profile, wearing a black VR headset. She is looking towards the left. The background is dark with out-of-focus, colorful lights in shades of blue, green, yellow, and red, creating a bokeh effect. The overall mood is futuristic and immersive.

5G hálózatok – helyzetkép
és perspektívák

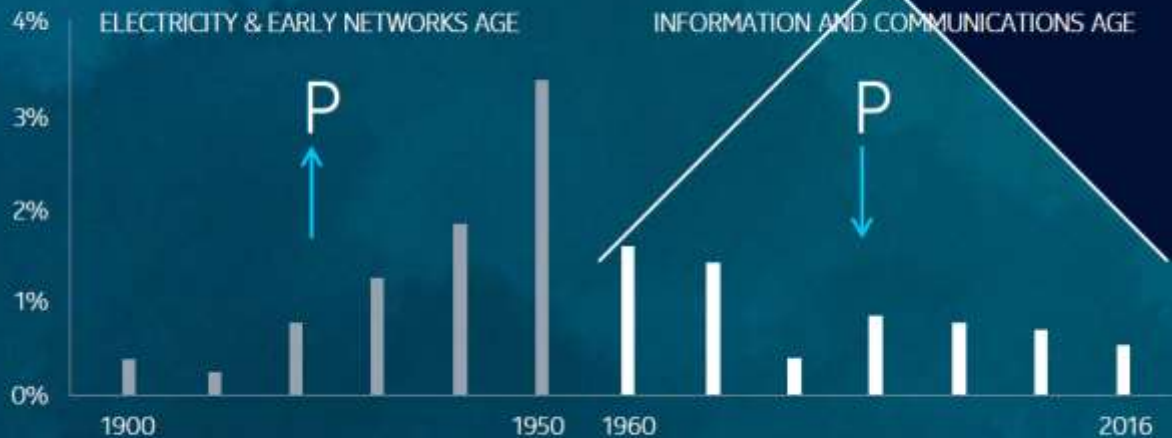
Zagyva Béla / 2019.05.22

Essential Perspective: The 3 Limits





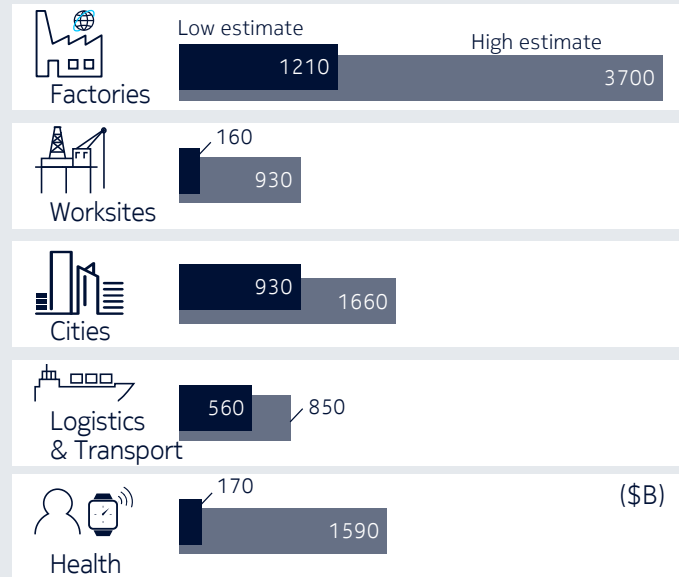
US Productivity Growth



STAGNATION
IN PRODUCTIVITY
GROWTH

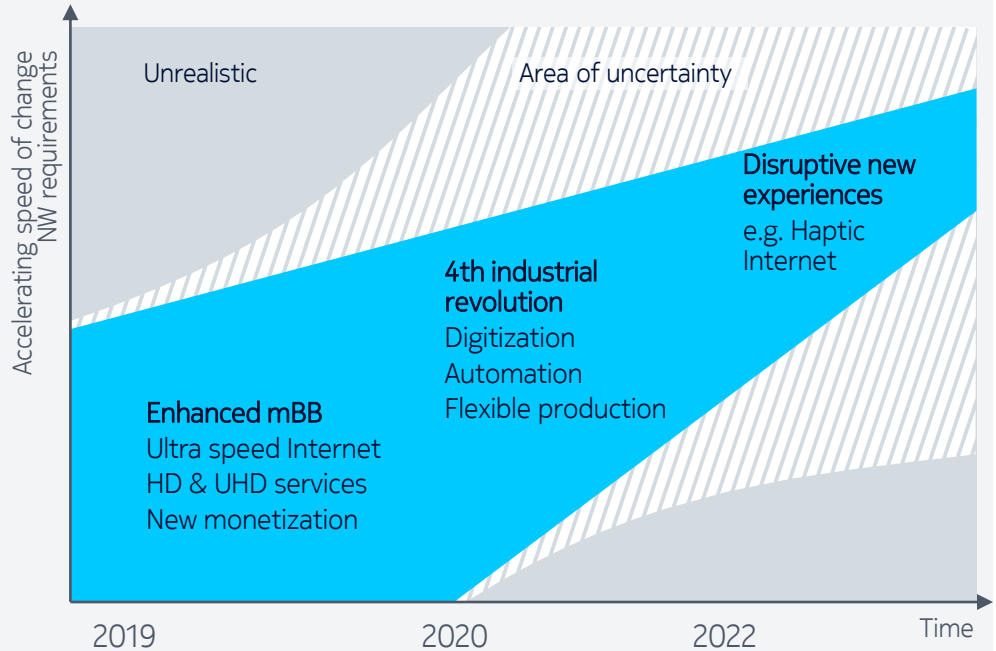
The quest for new economic value

New DSP markets offer significant revenue expansion



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

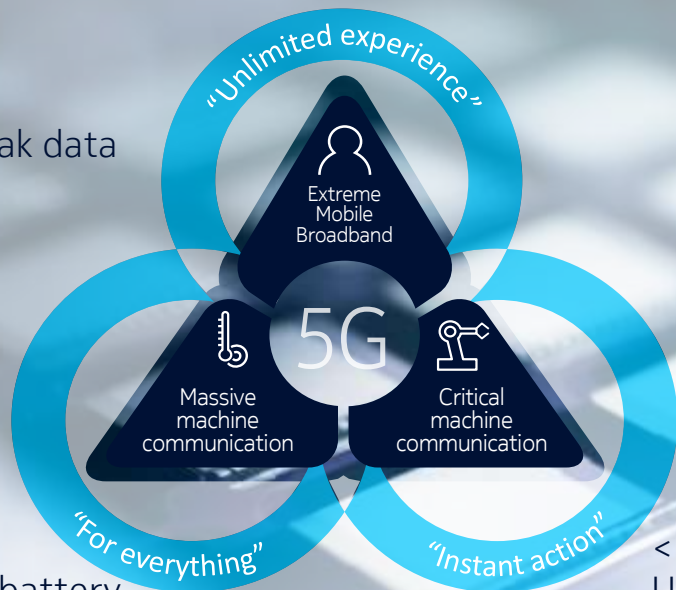
...be prepared for the obvious and the uncertain



5G Future X

Unleashing the 5G potential

x10k traffic
>10Gbps peak data



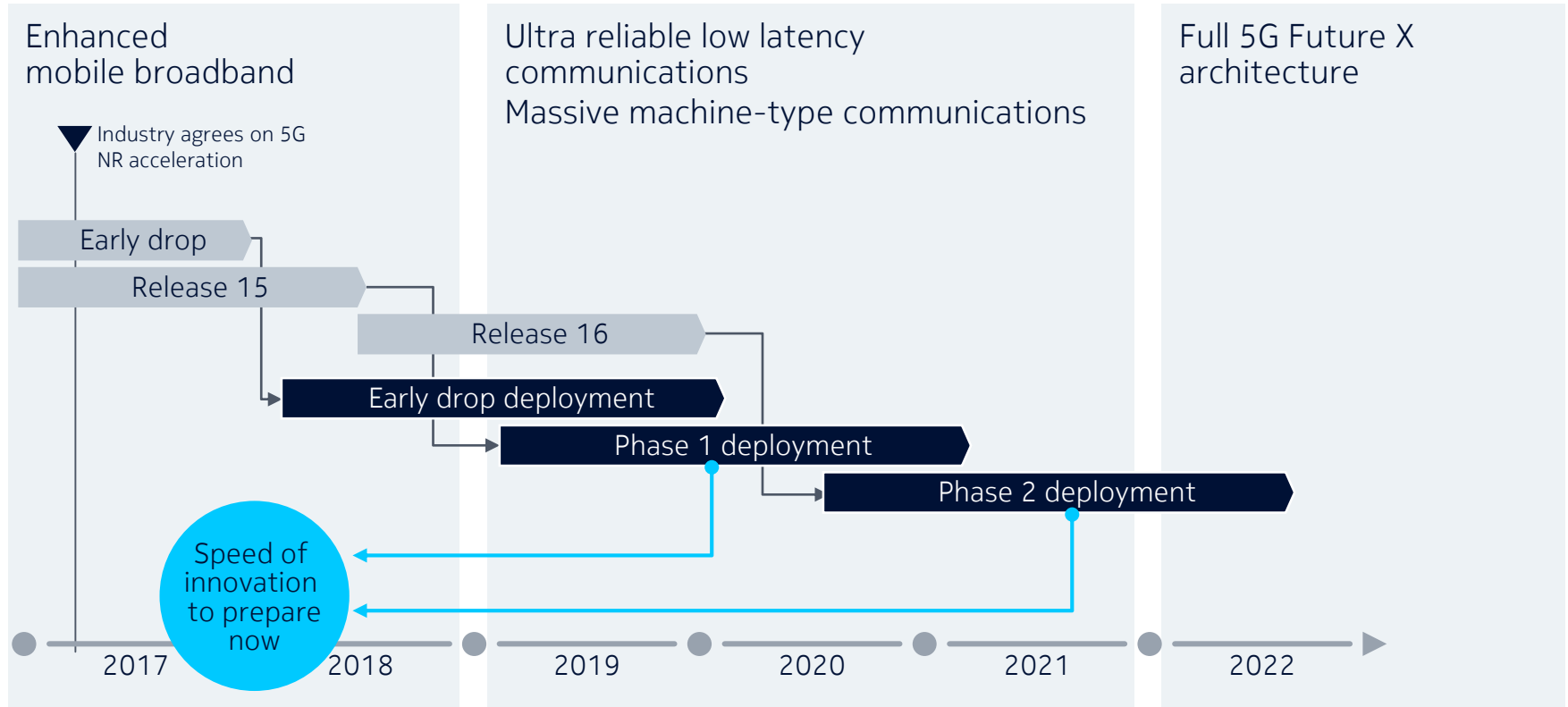
10 years on battery
1M devices/km²

<1ms latency
Ultra reliability

Optimization focus
Bit/s/Hz/m²/joule/\$

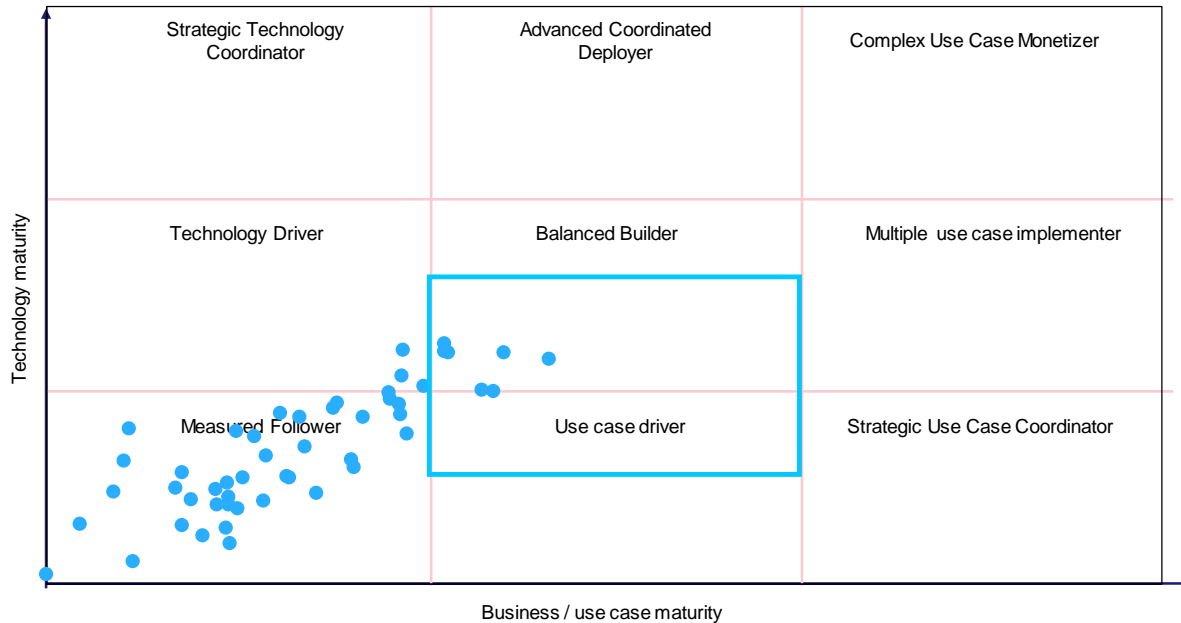
Architecture design
Cloud native
Scalable
Automated
AI driven
Open

Accelerating 5G NR – arriving one year earlier than expected



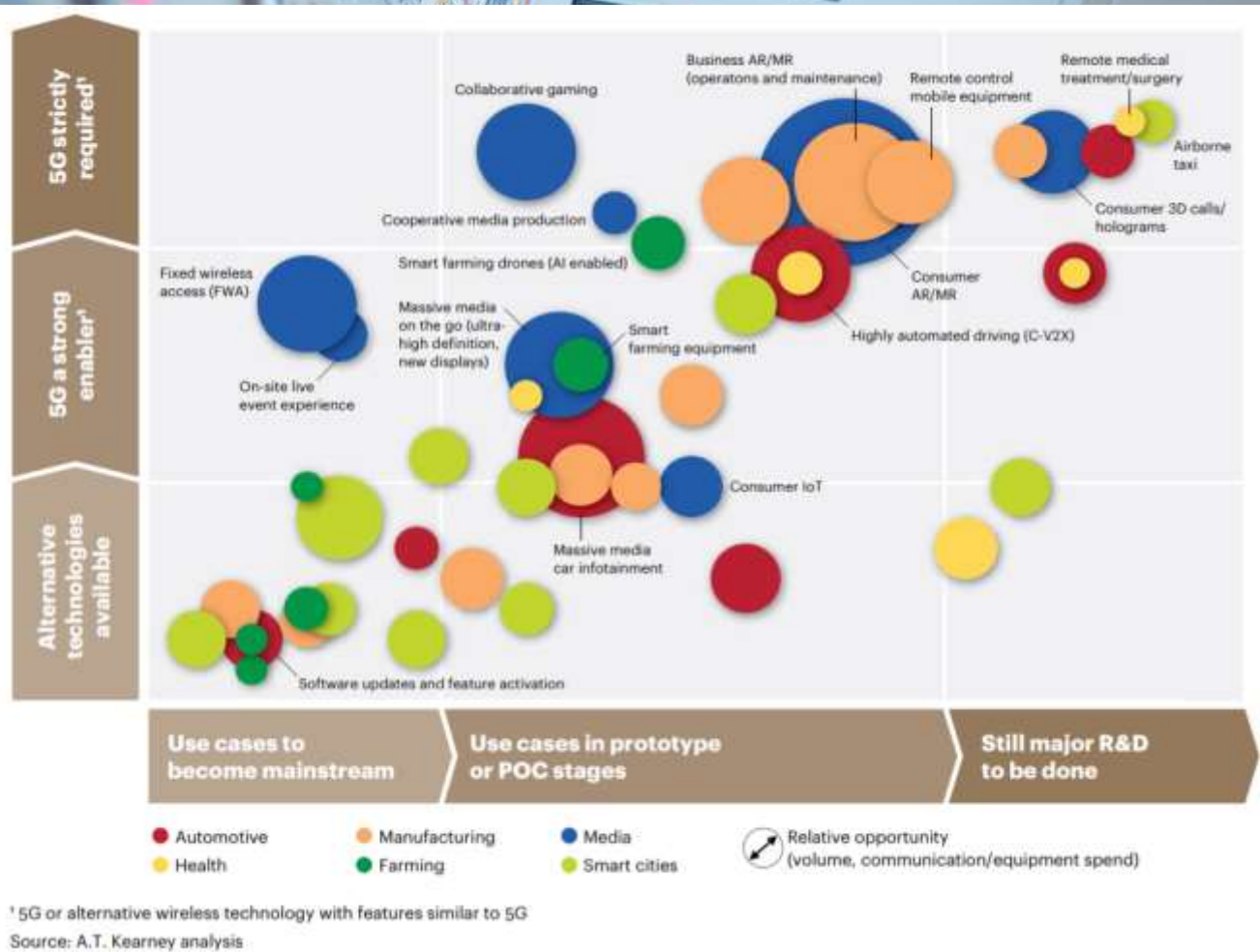
Aligning 5G transformation with business objectives and technology maturity

5G Maturity Index – Balanced Builders best practices



Source: Analysys Manson 2019

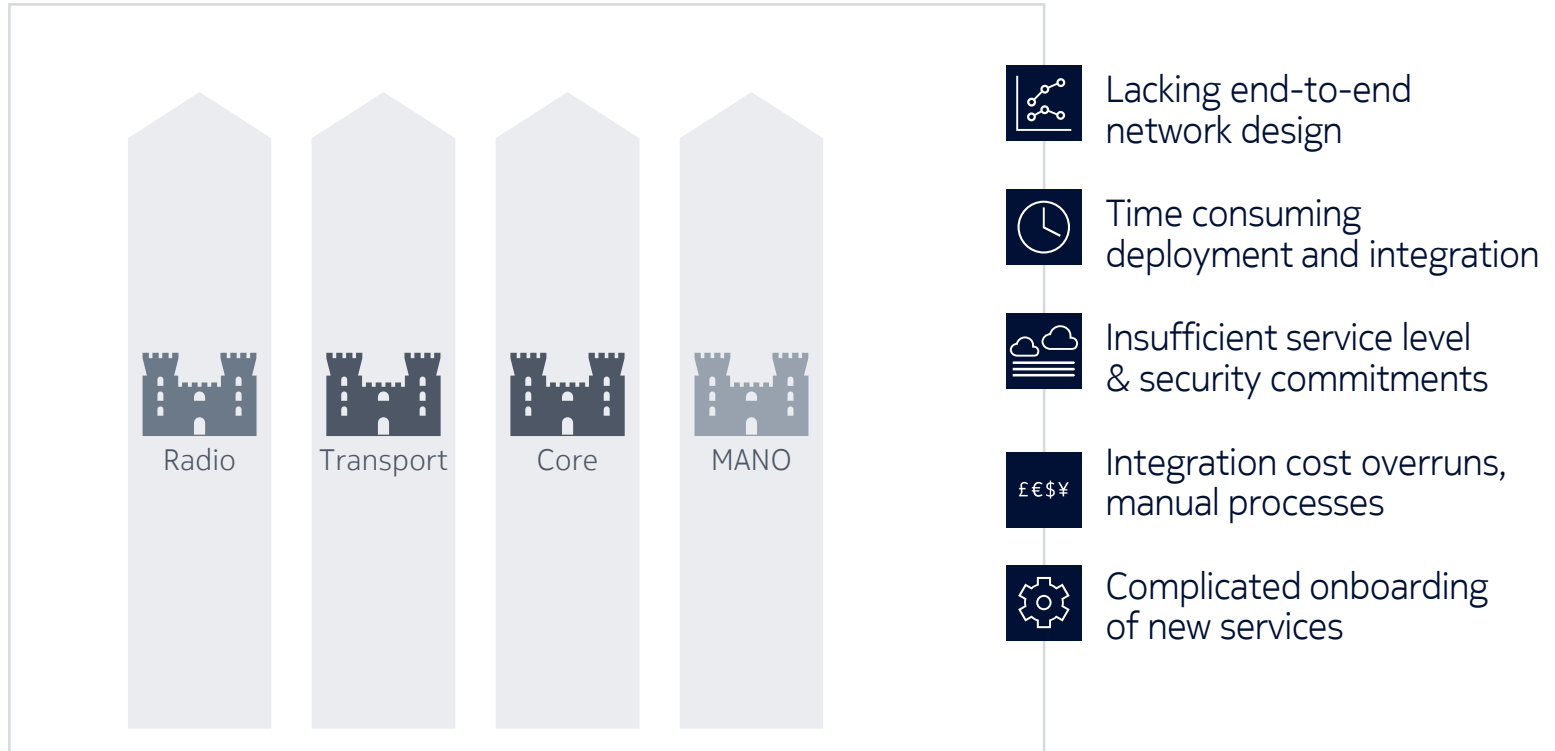
Ambitious strategy as key driver to 5G success 86%	8+ use cases
Ecosystem multiple partner communities 100%	Automation having/considering e2e SON 86%
Digitalization using or planning to use AI/ML by 2020 100%	Commercial deployment OSS/BSS transformation 60%



* 5G or alternative wireless technology with features similar to 5G

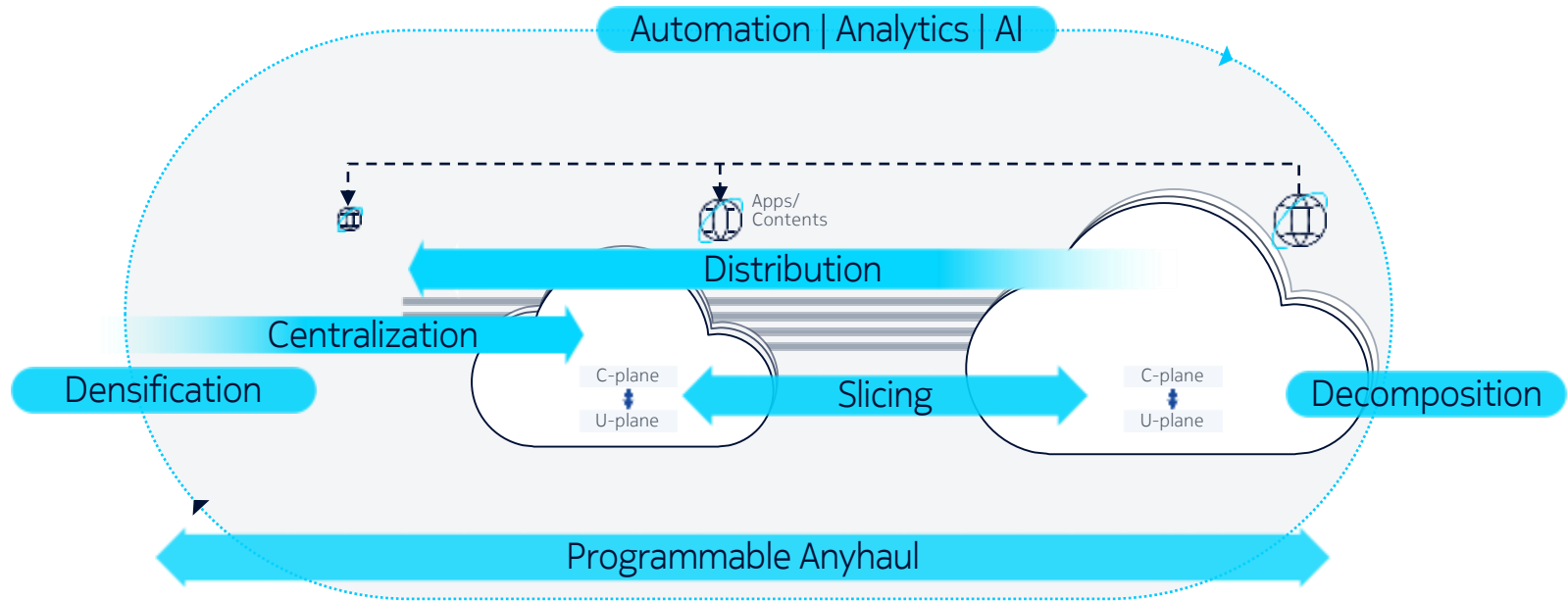
Silos hinder fast and cost efficient 5G deployment

Time-consuming and costly post-deployment integration



The path to 5G contains much more than radio

Seven closely synchronized streams towards 5G network



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

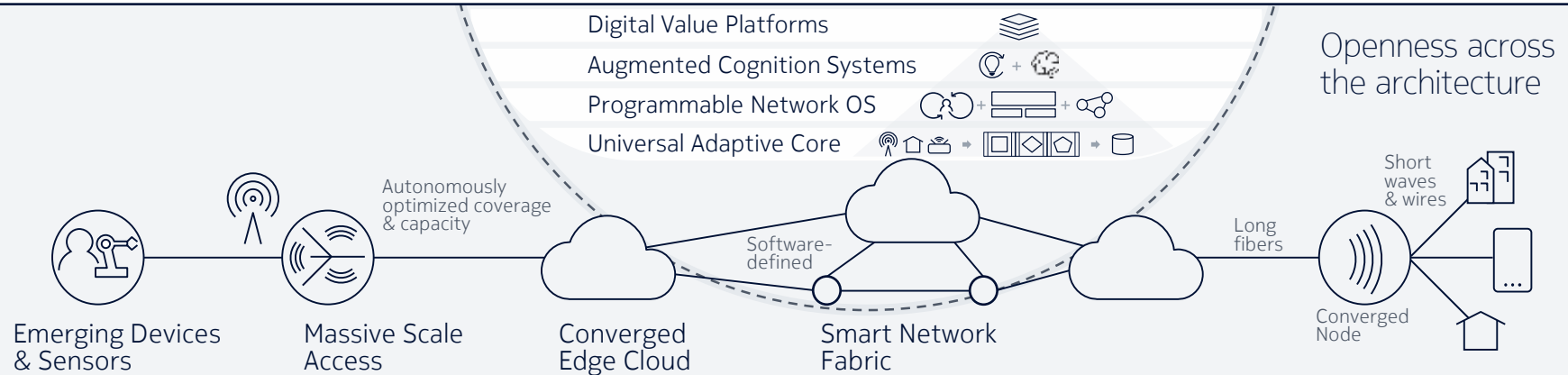
Zero-touch network optimization in ns tact

Cloud-native architecture

Web-scale capacity and programmability

Fully automated network slicing

30% TCO savings



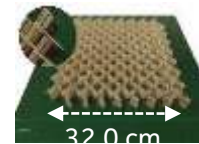
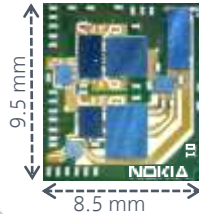
Quantum leap in antenna economics: ultra deployable RFIC mMIMO antenna

mMIMO and beamforming ideal for 5G dense urban rollout

Nokia RFIC mMIMO

Ultra Deployable mMIMO antenna

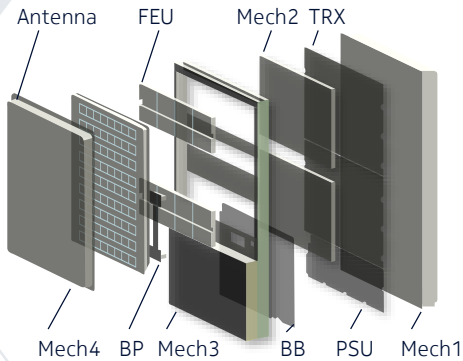
Extreme silicon integration



Dual-Polarized, 8 x 8 x 2 = 128



16TRX, 8W: 7/4kg
64TRX, 32W: 22/20kg*



Traditional mMIMO

Deployment

Any-where

Size/weight of mMIMO antennas

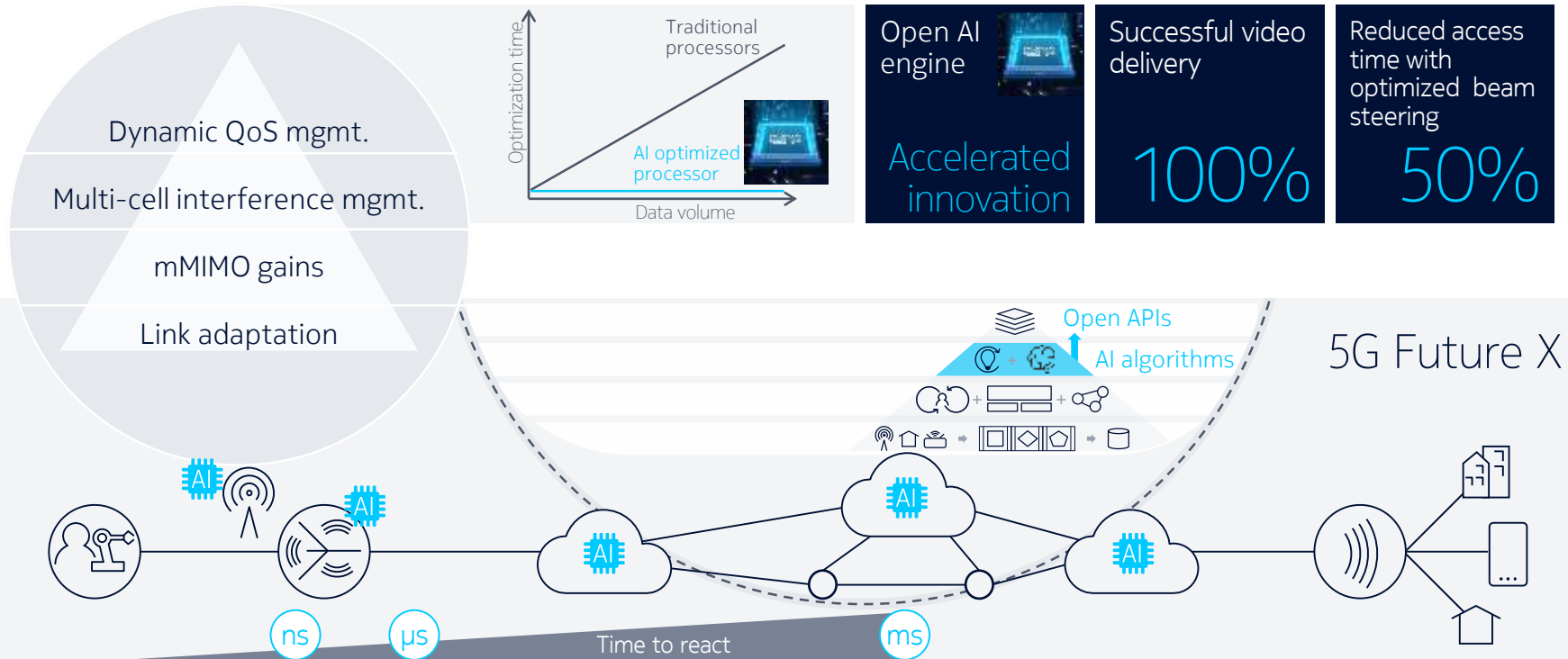
Half

Video capacity

3.5x

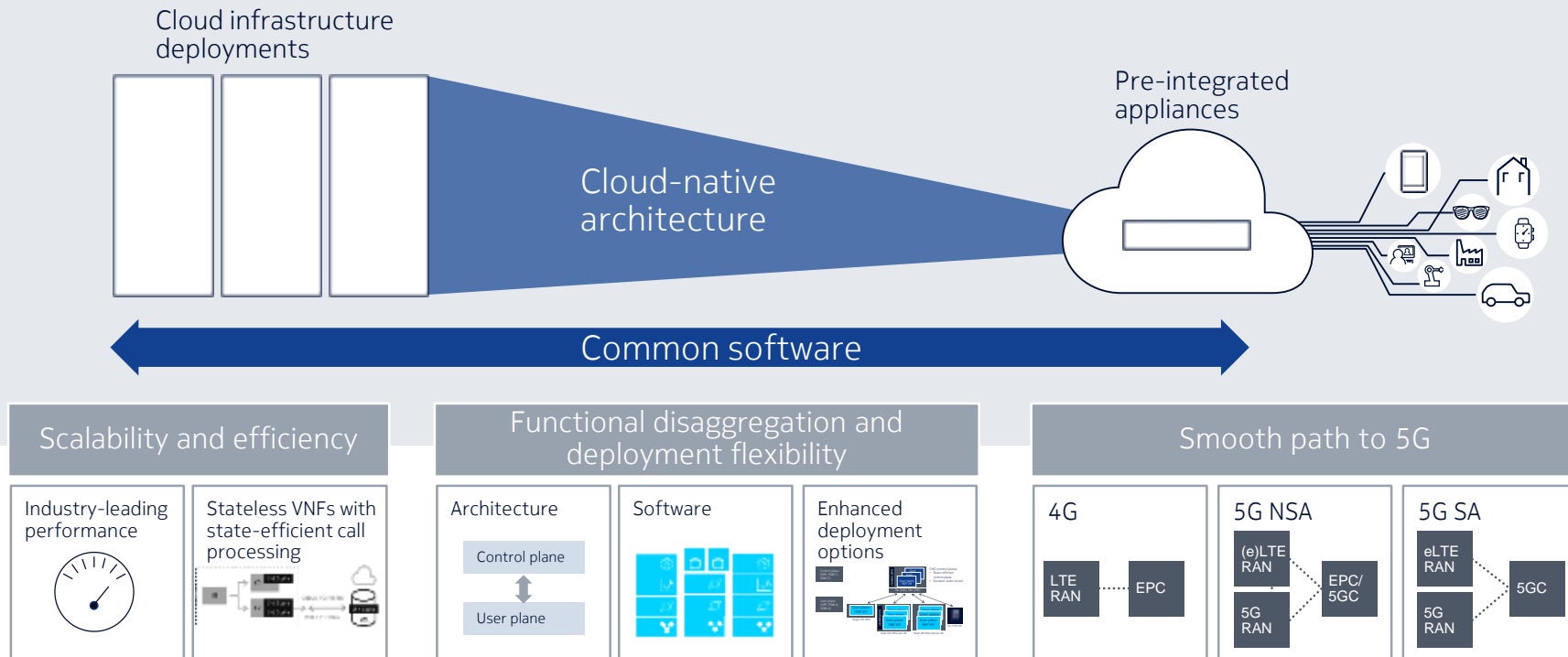
Embedding open AI into the architecture

Network optimization in Nanoseconds timescales



5G ready cloud packet core

Web-scale capacity and programmability on the road to 5G NGC

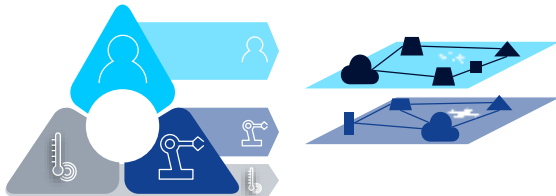


Fully automated network slicing across RAN, core and transport

Most economic way to deliver the highly diverse customer needs

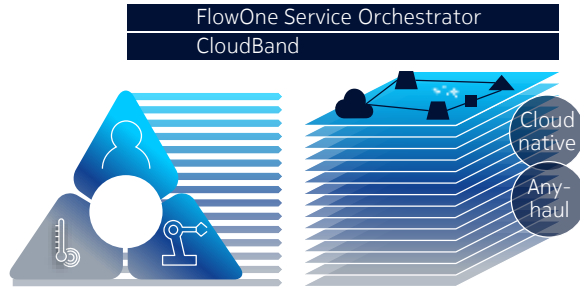
From any network to my dedicated network

Manually sliced

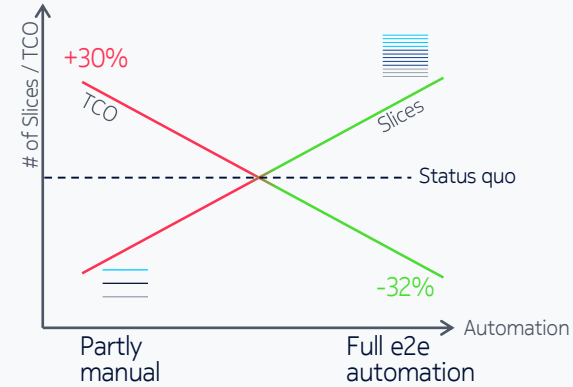


Multi-touch

Automated and AI enhanced



Single- & Zero-touch



Instead of
10 slices on
same infra

1 Mio

Time to
market

Minutes

Optimal
resource
utilization

any time

INOKIA

