European Activities on 5G Evolution & 6G

5G IA
INFRASTRUCTURE ASSOCIATION

The voice of the European industry for the developement, deployment and evolution of 5G

Presentation to International Committee of Beyond 5G Promotion Consortium.

Dr. Colin Willcock

July 7th 2021

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5G Research (5G PPP)

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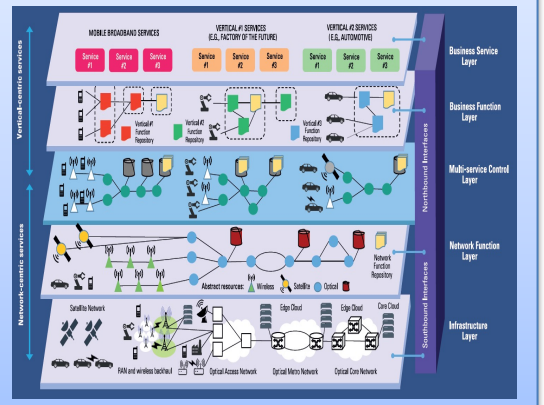
PHASE 1:
5G Core Research

main achievements:

- 5G System design & Evaluation aspects
- 5G Air interface innovations
- Network management & Security innovations
- Virtualization & Service deployment innovations
- 100s of contributions to standardization

PHASE 2:
5G Vertical Trials

PHASE 3:
5G Platforms



2015 2016 2017 2018 2019 2020

- 62 R&I projects since the beginning of the Program
- 800+ contributions to standardization activities (Phase II and Phase III)
- Over 1300 scientific publications (Phase II and Phase III)
- Design, evaluated and validated multiple technological breakthroughs

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SMART NETWORKS AND SERVICES
2021 - 2027

6G networks, new applications and end devices

5G IA INFRASTRUCTURE ASSOCIATION

Alliance for Internet of Things Innovation

CISPE.cloud

2020 NETWORLD

NESSI

Proposal supported by more than 1.000 organisations: Industry, SMEs, R&D centers and Universities)

900 M€ public funding
+
900 M€ private funding

SNS – STRATEGIC OBJECTIVES

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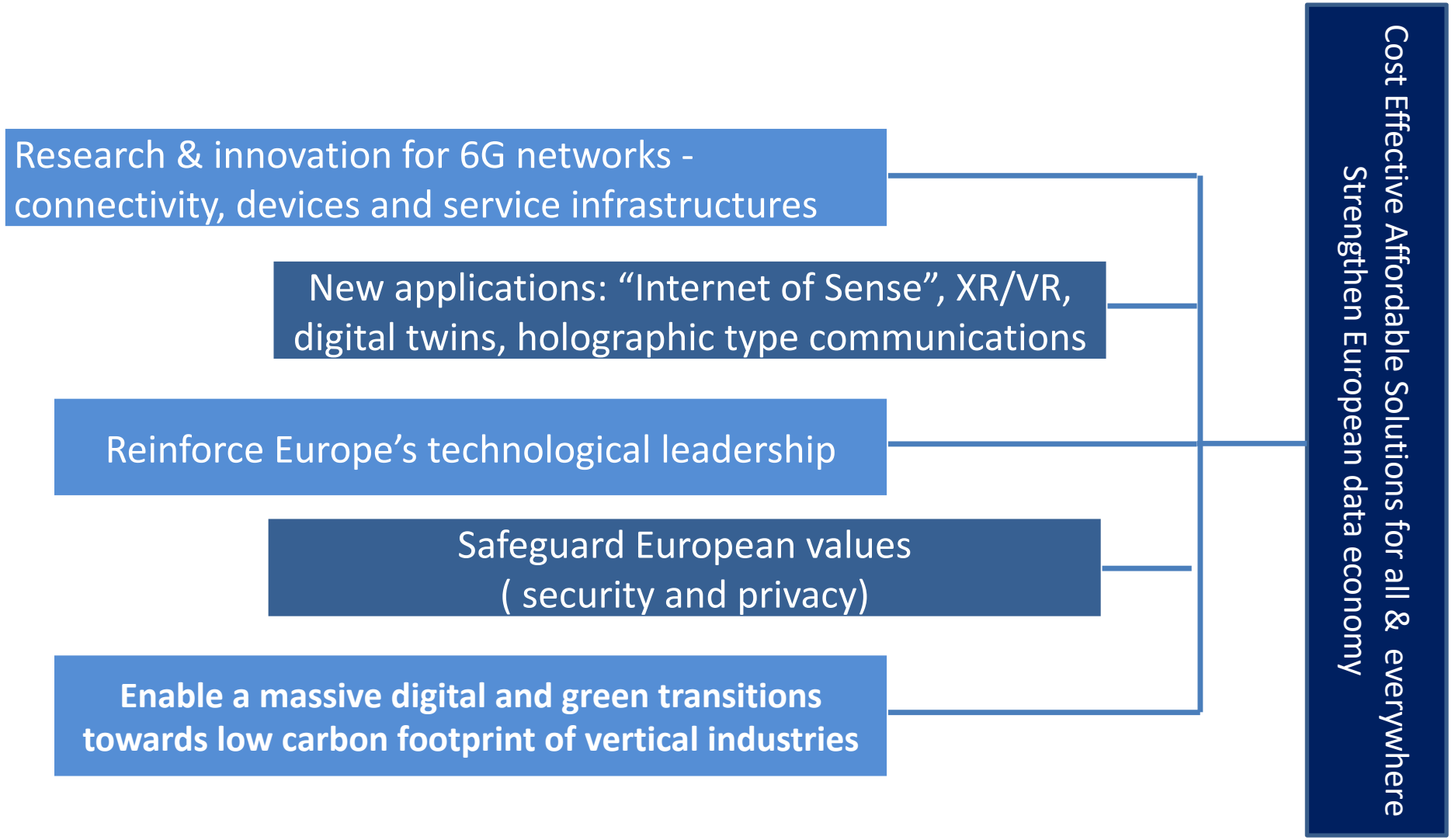
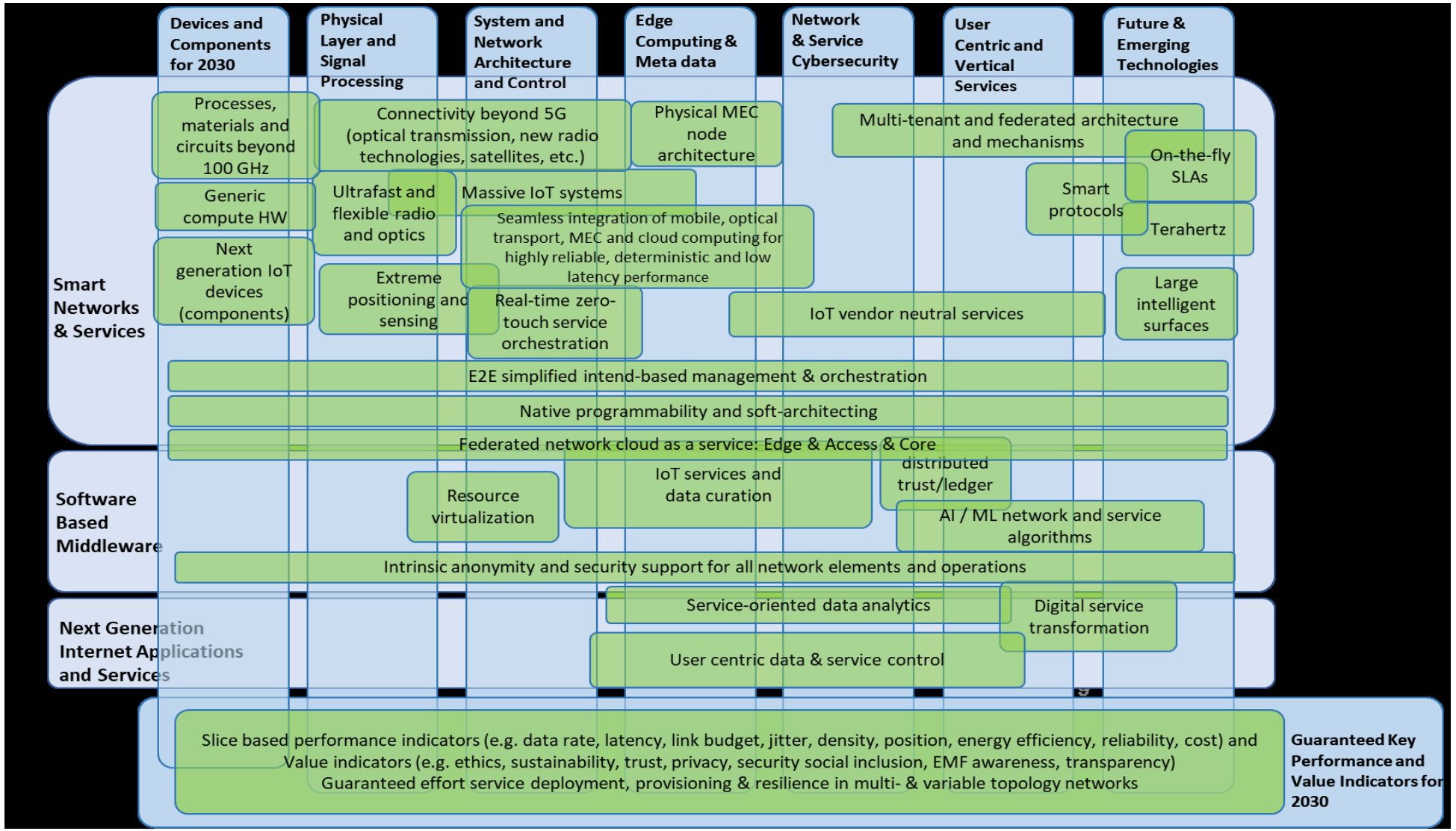


What do we have study and solve?



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Proposed structure of the Work Programme

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5G Evolution (40%)

Stream A (20% - RIA): Smart communication components, systems and networks for 5G mid-term Evolution systems

Stream D (20% - IA): Large Scale SNS Trials and Pilots with Verticals

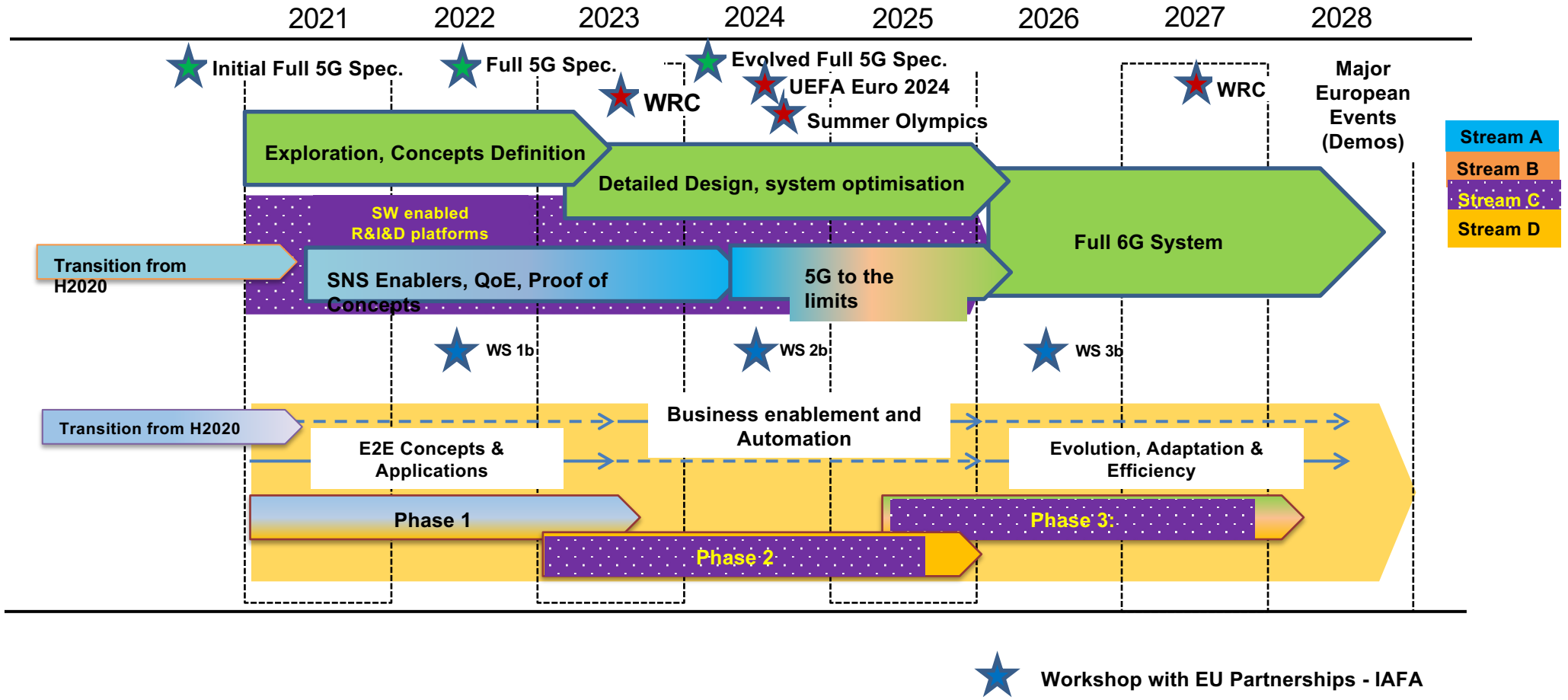
6G (60%)

Stream B (50% - RIA): Research for radical technology advancement towards 6G

Stream C (10% - IA): SNS experimental infrastructures

CSAs - TBD

SNS Roadmap



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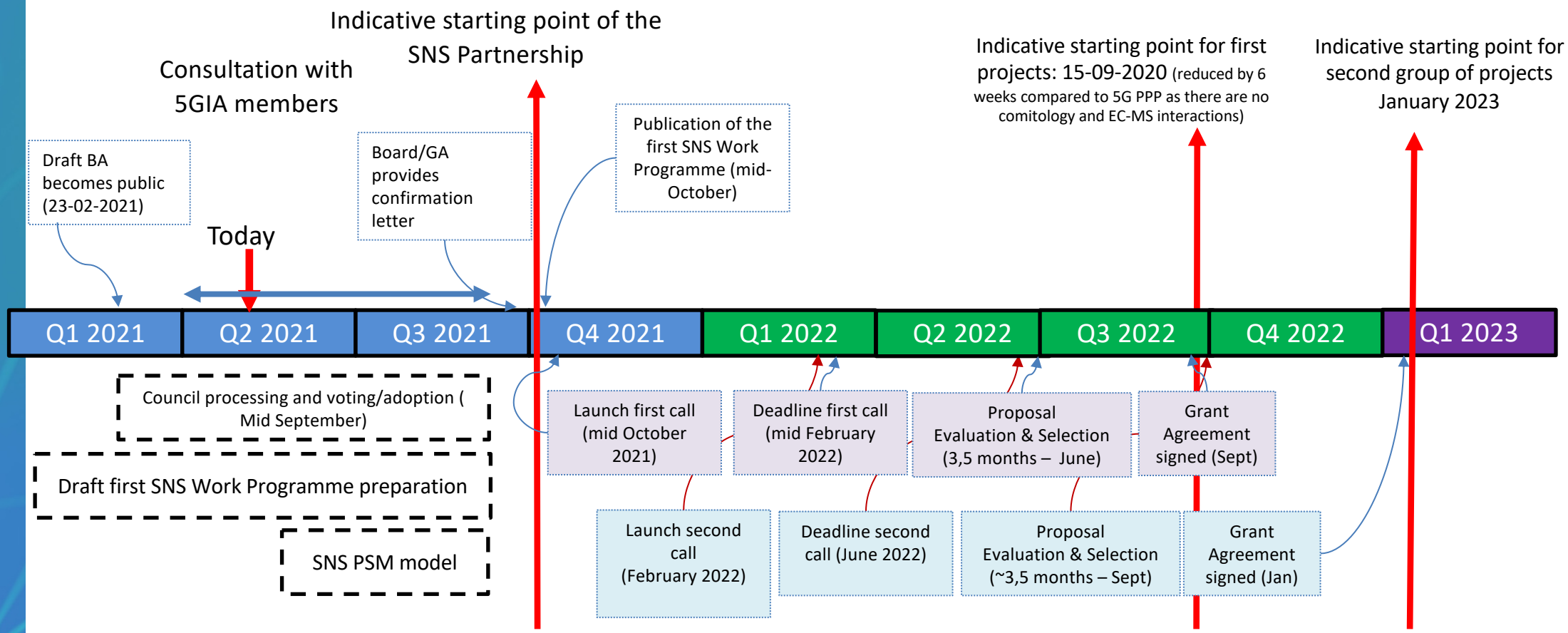

Information Days
EuCNC 2021

Thank you for your attention!

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http://5g-ia.eu

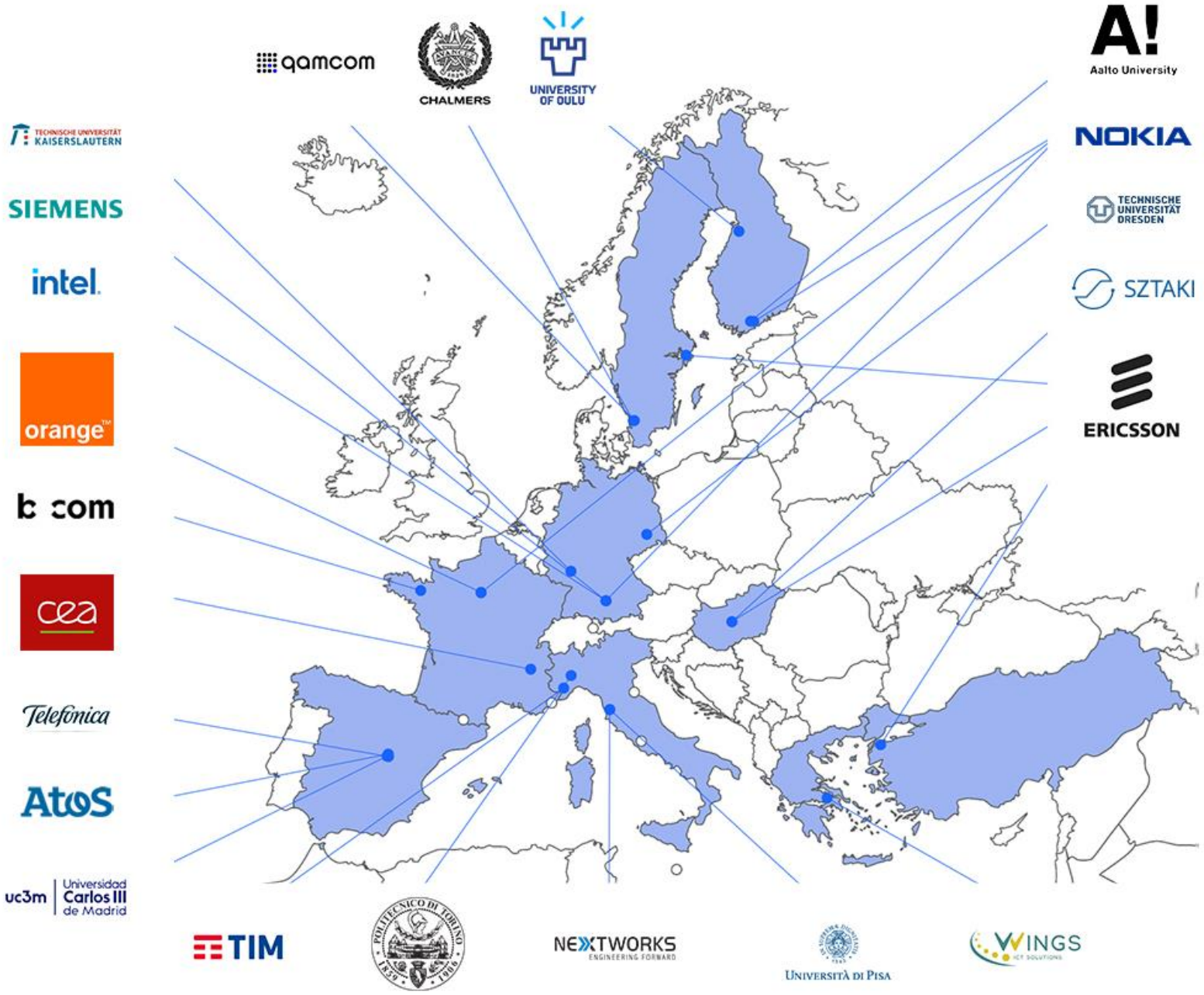
Hexa-X European 6G Flagship project overview and 6G vision

July 2021

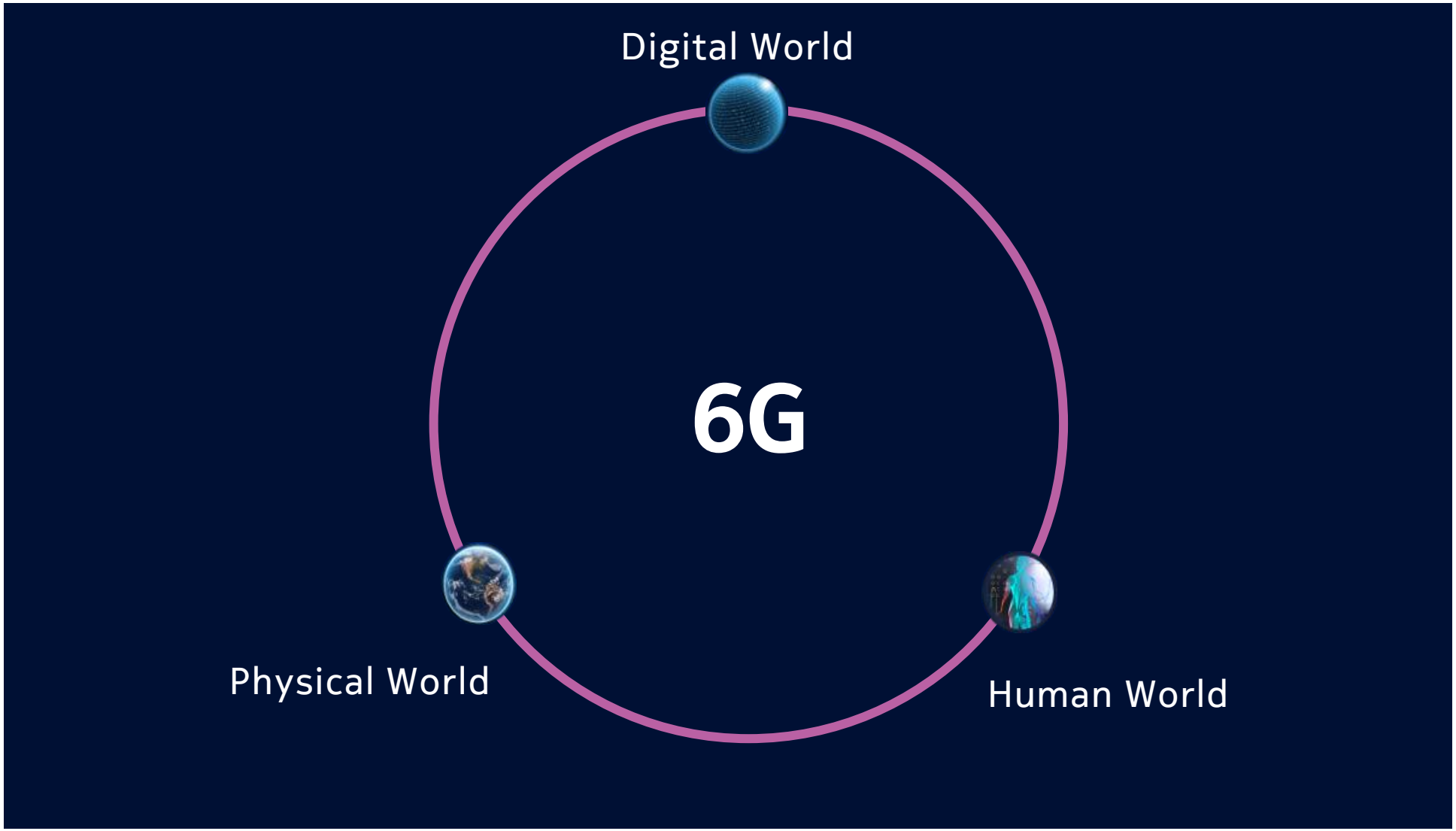
hexa-x.eu

Mikko.Uusitalo@nokia-bell-labs.com

Hexa-X Consortium



Hexa-X Vision



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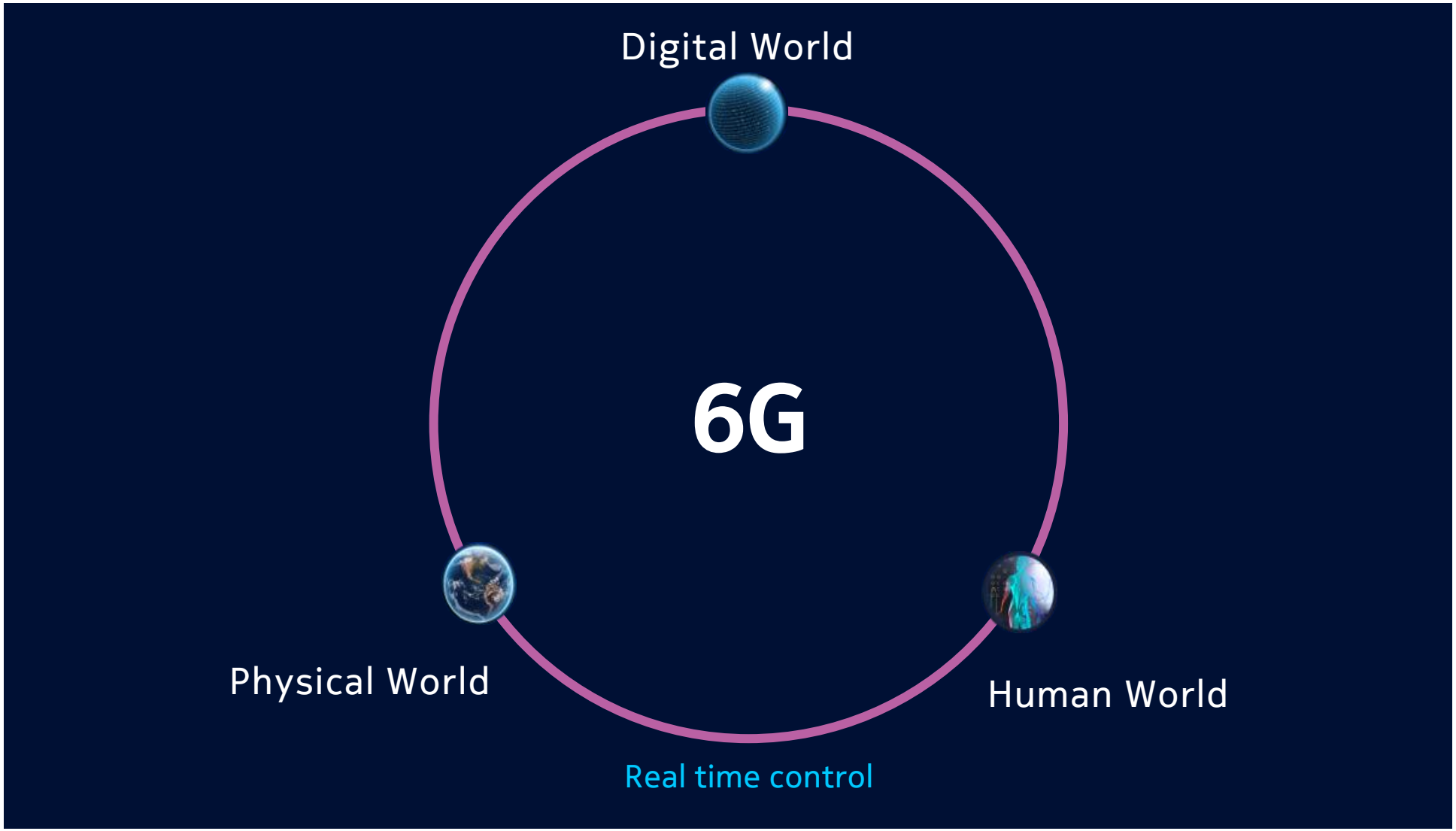
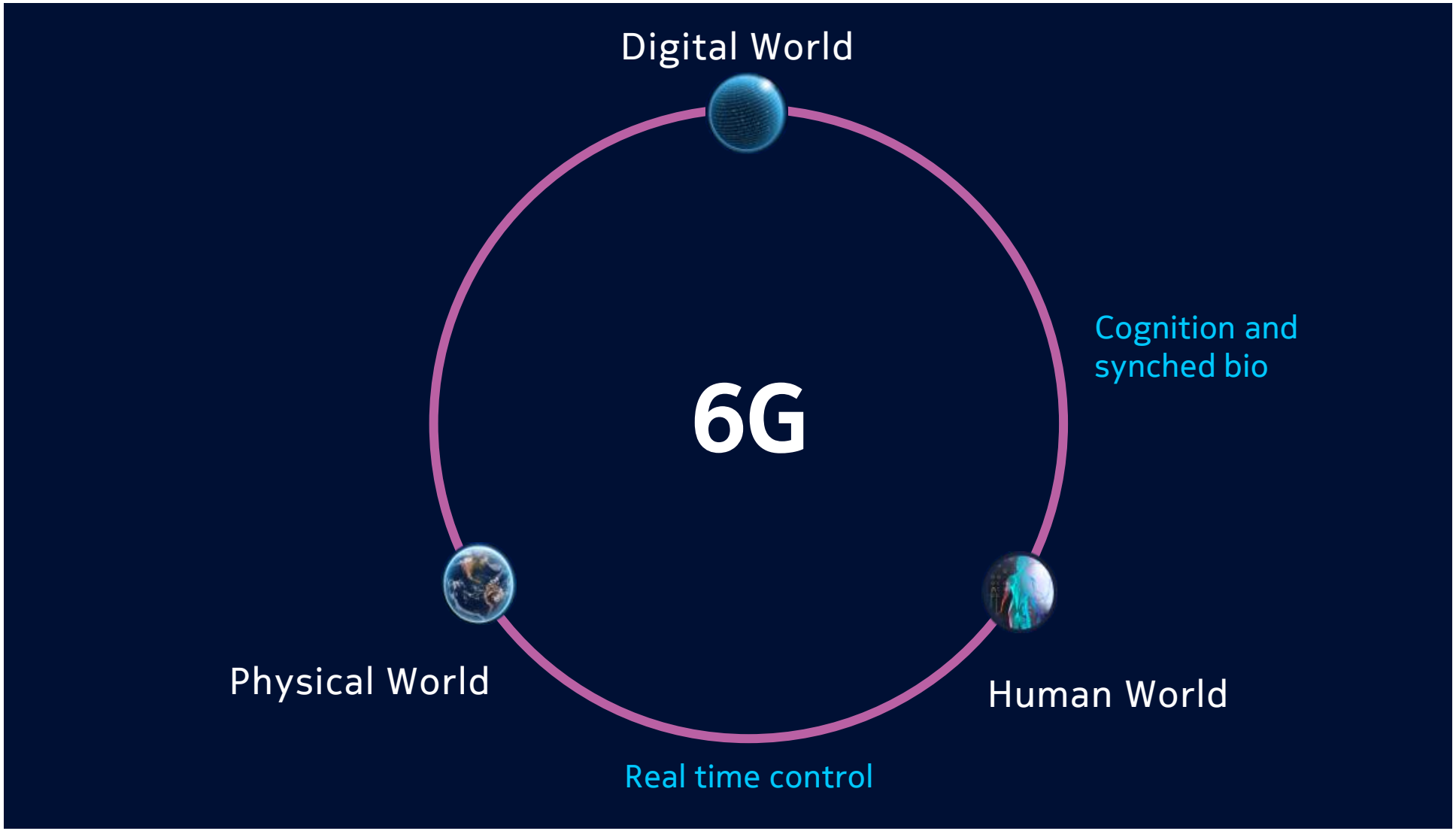
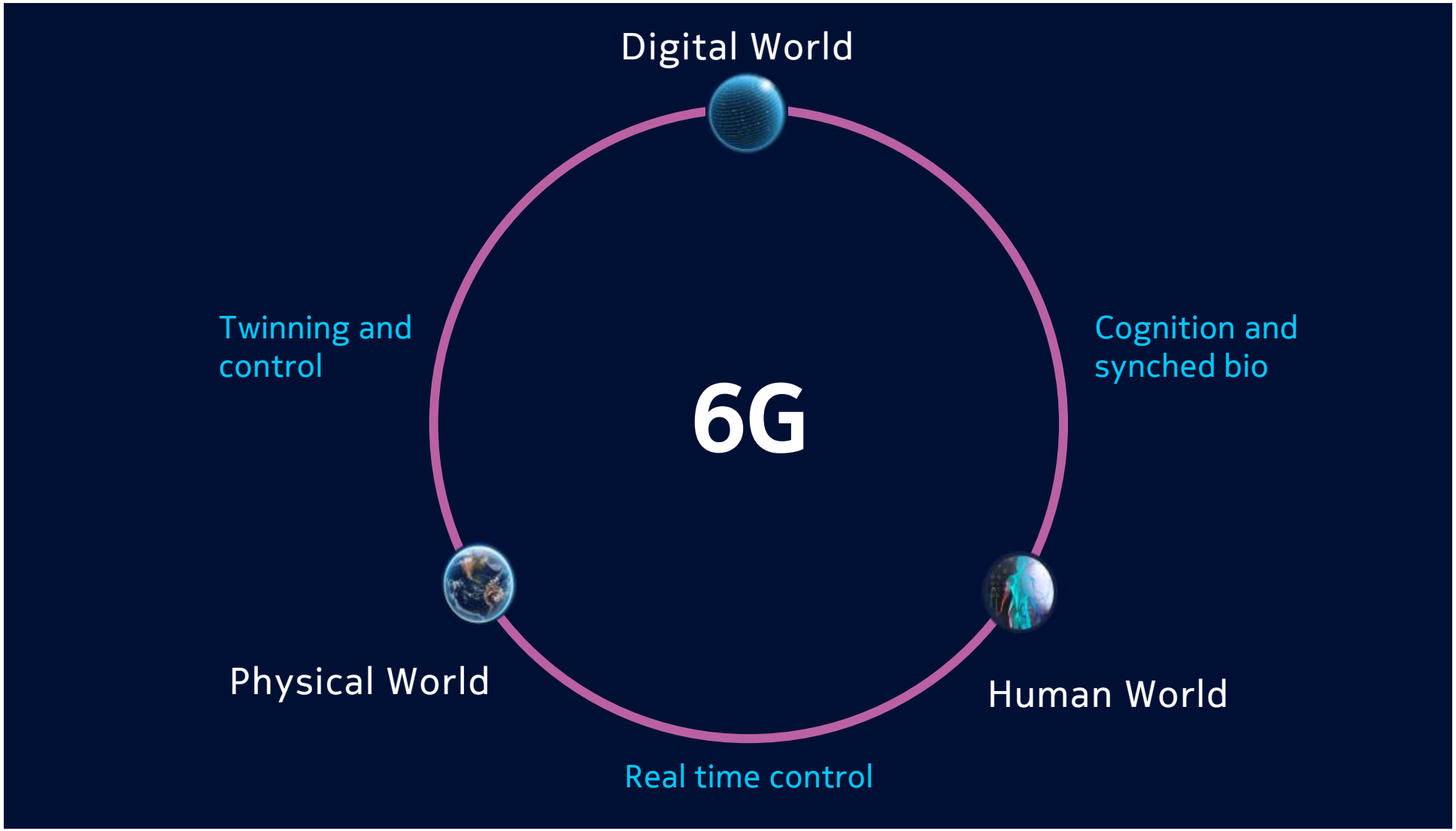


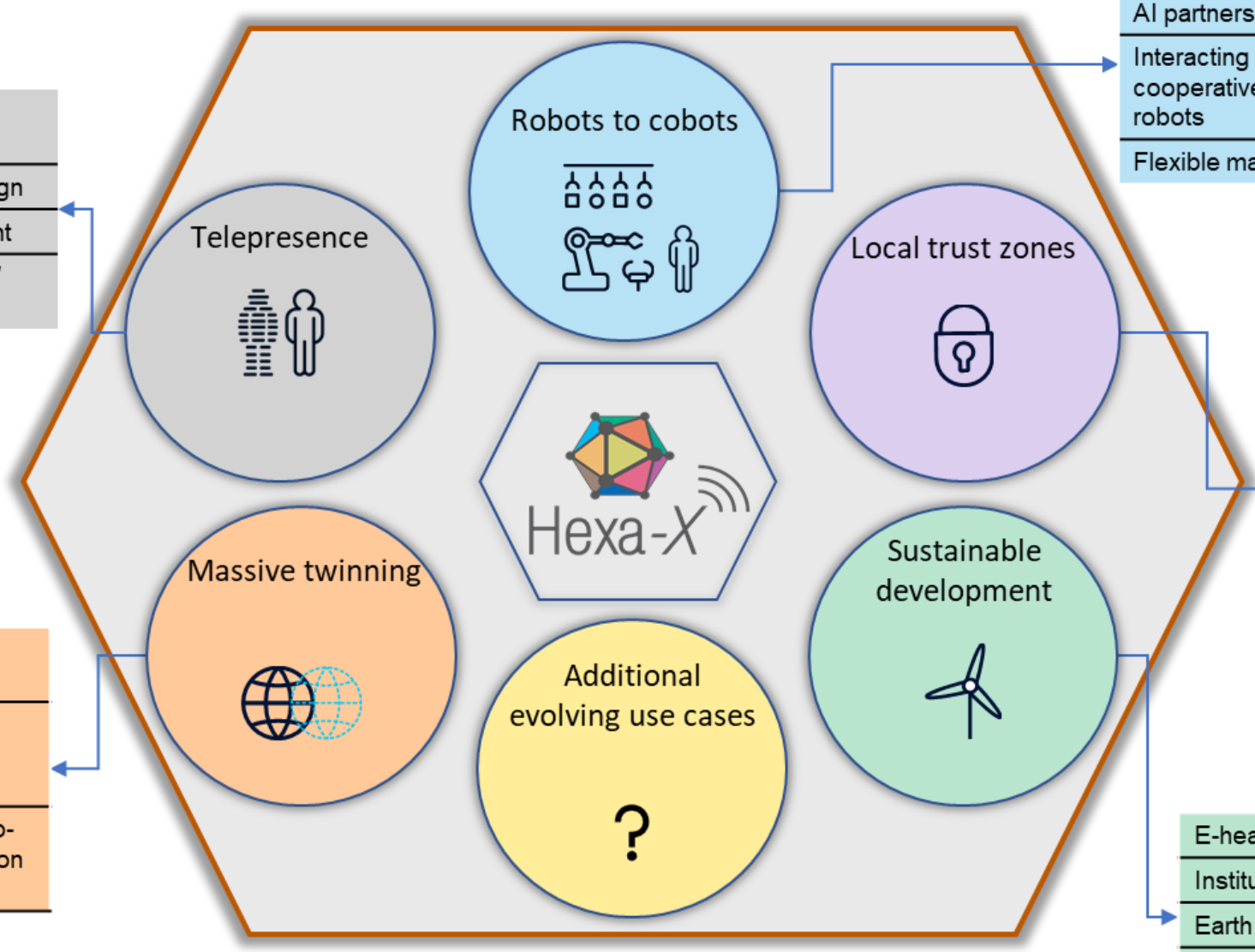
Hexa-X Vision



Hexa-X Vision



Hexa-X use cases



- Consumer robots
- AI partners
- Interacting and cooperative mobile robots
- Flexible manufacturing

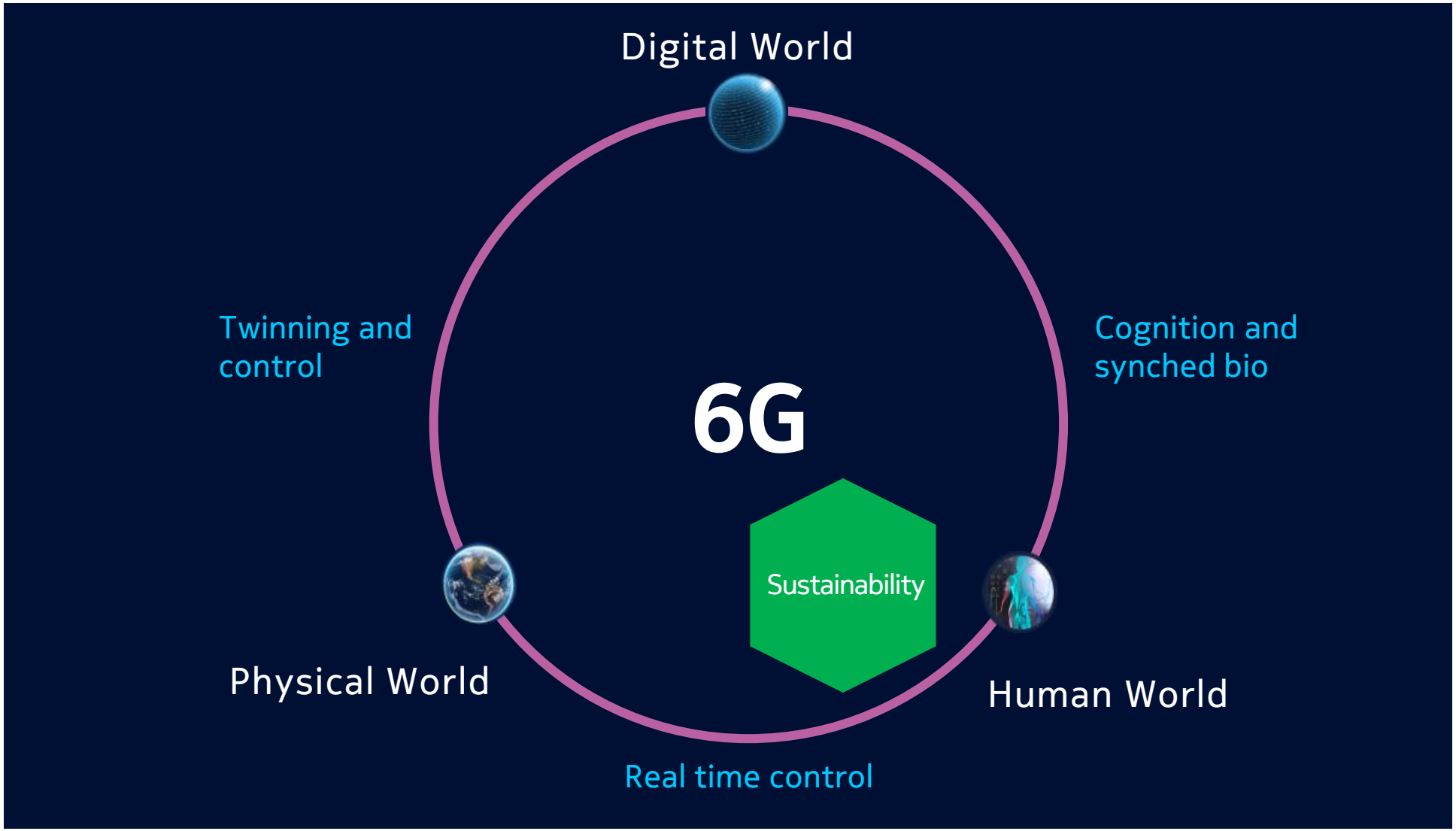
- Fully merged cyber-physical worlds
- Mixed reality co-design
- Immersive sport event
- Merged reality game/ work

- Enabling precision healthcare and personalized medical treatment
- Sensor infrastructure web
- 6G IoT micro-networks for smart cities
- Infrastructure-less network extensions and embedded networks
- Local coverage for temporary usage
- Small coverage, low power micro-network in networks for production & manufacturing
- Automatic security

- Digital Twin for manufacturing
- Management of city flows to optimize the Liveability
- Digital Twins for zero-hunger and production sustainability

- E-health for all
- Institutional coverage
- Earth monitor
- Autonomous supply chains

Hexa-X Vision



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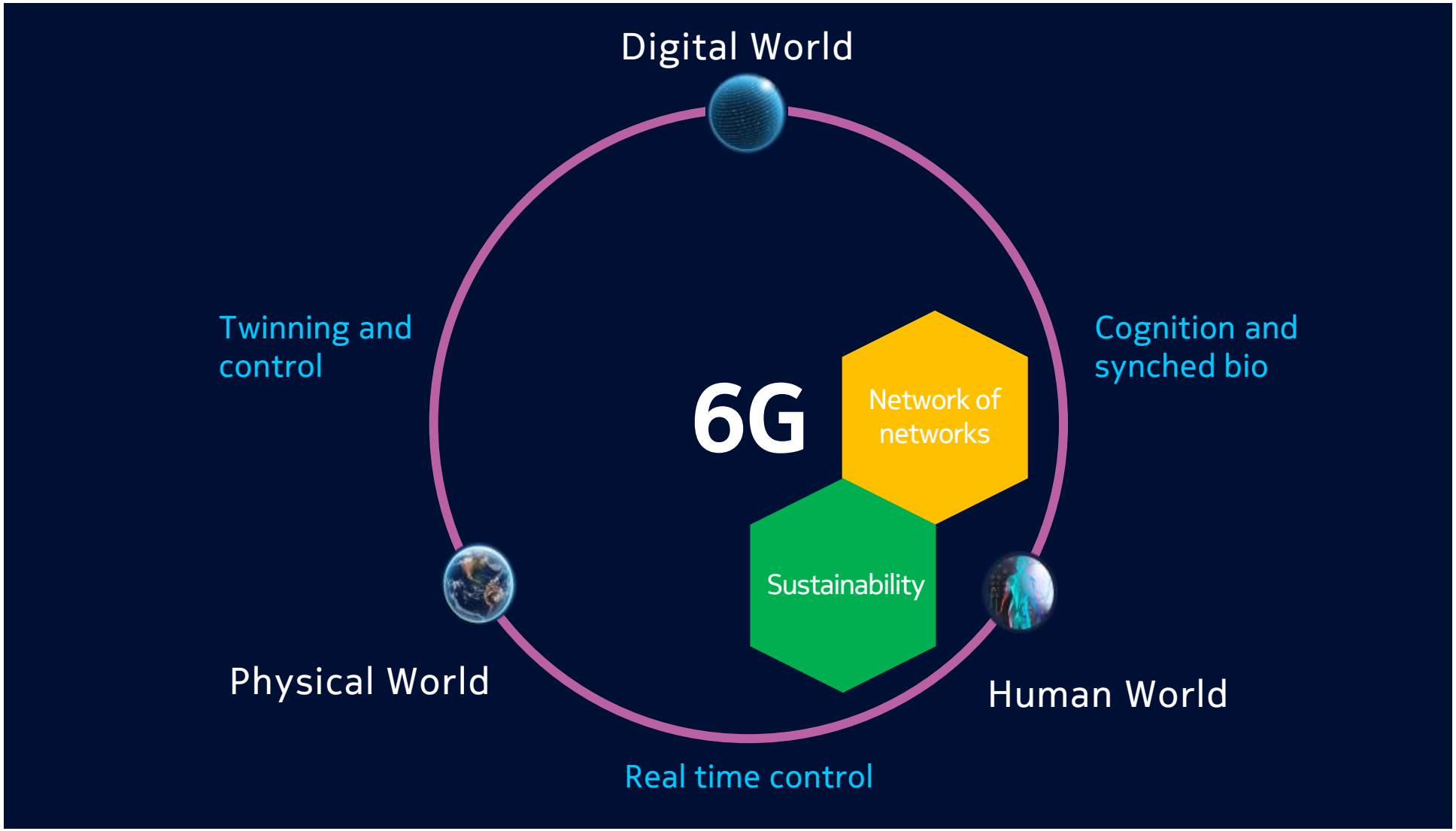

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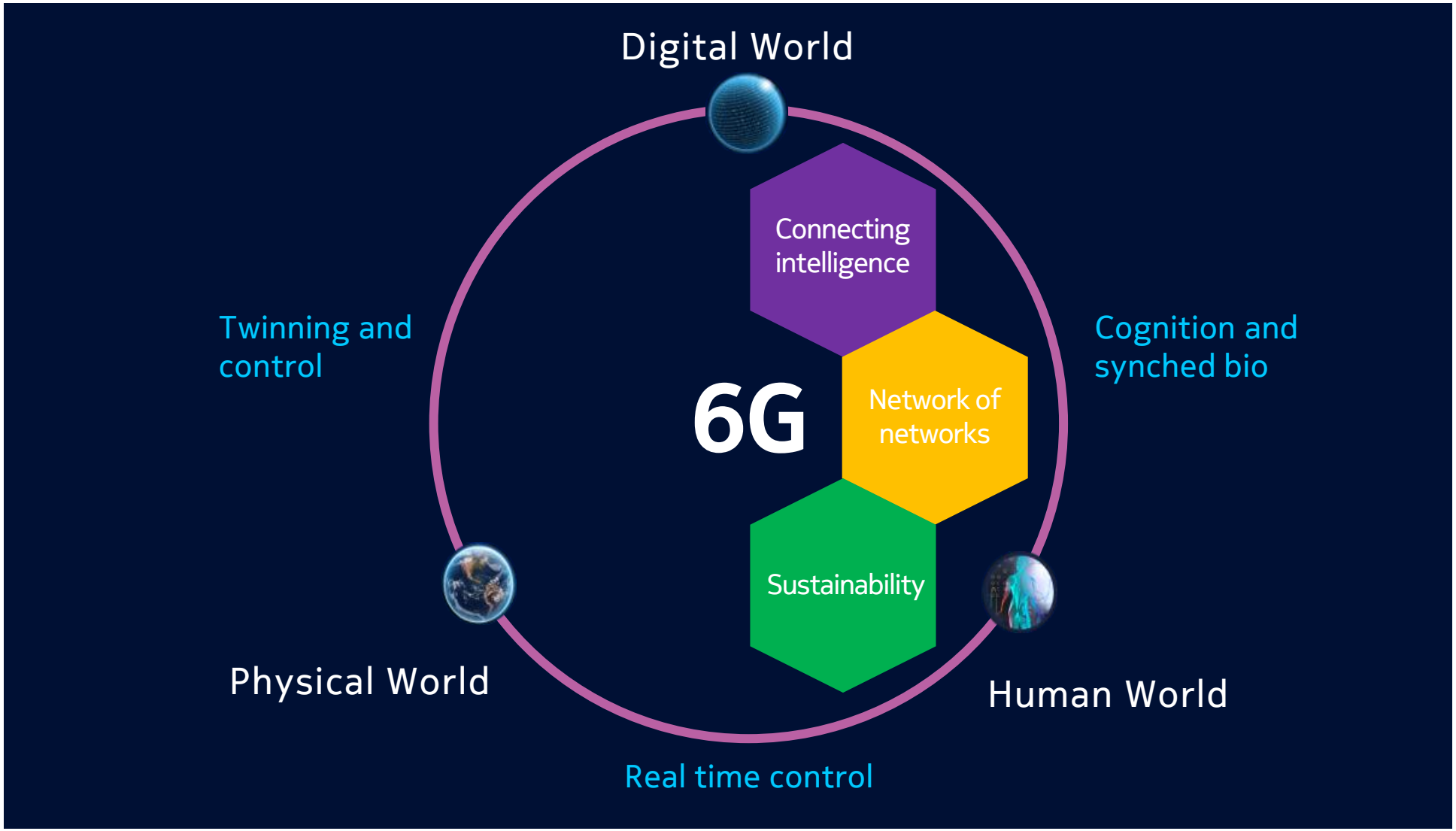

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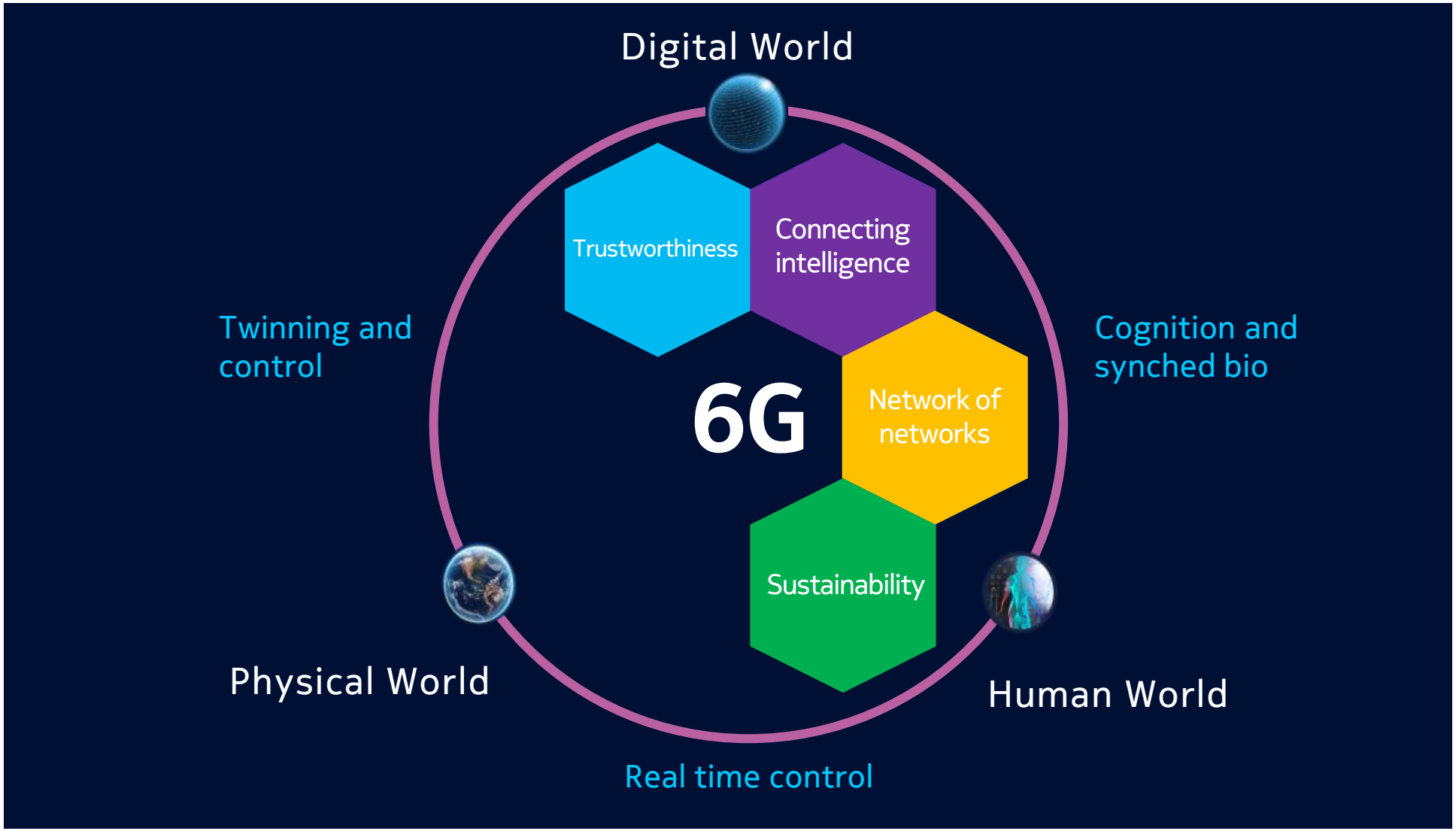
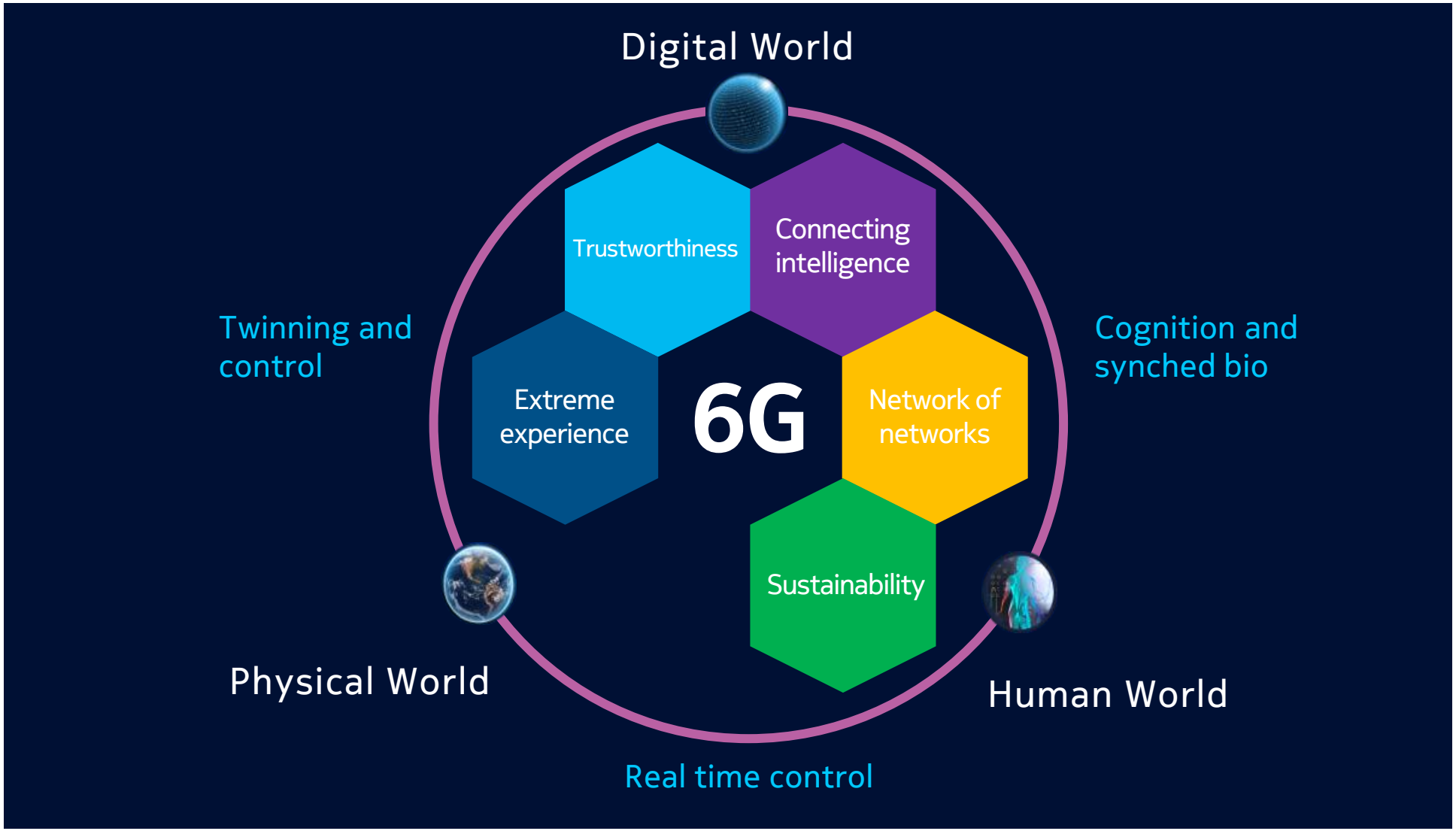


Hexa-X Vision



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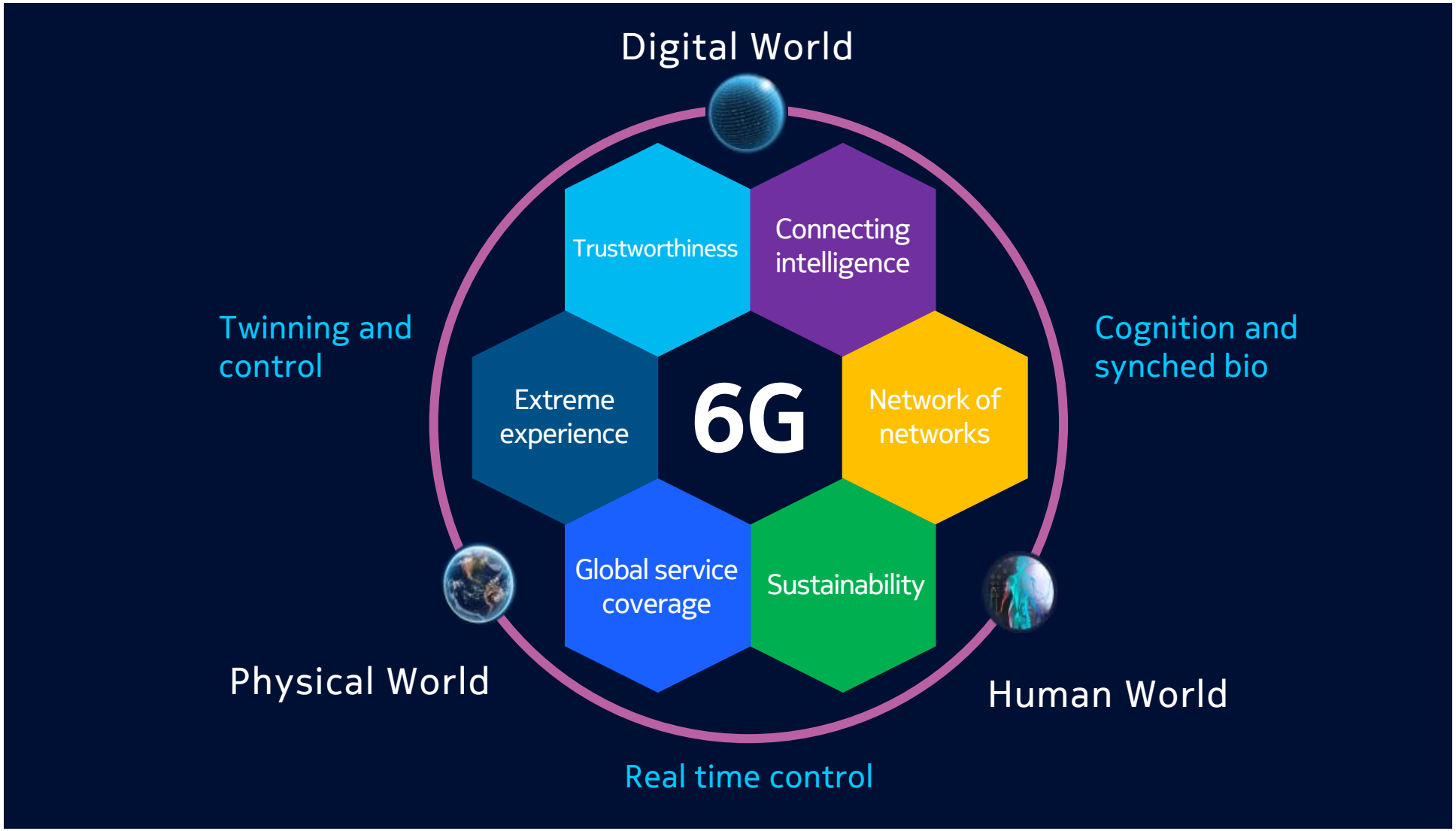
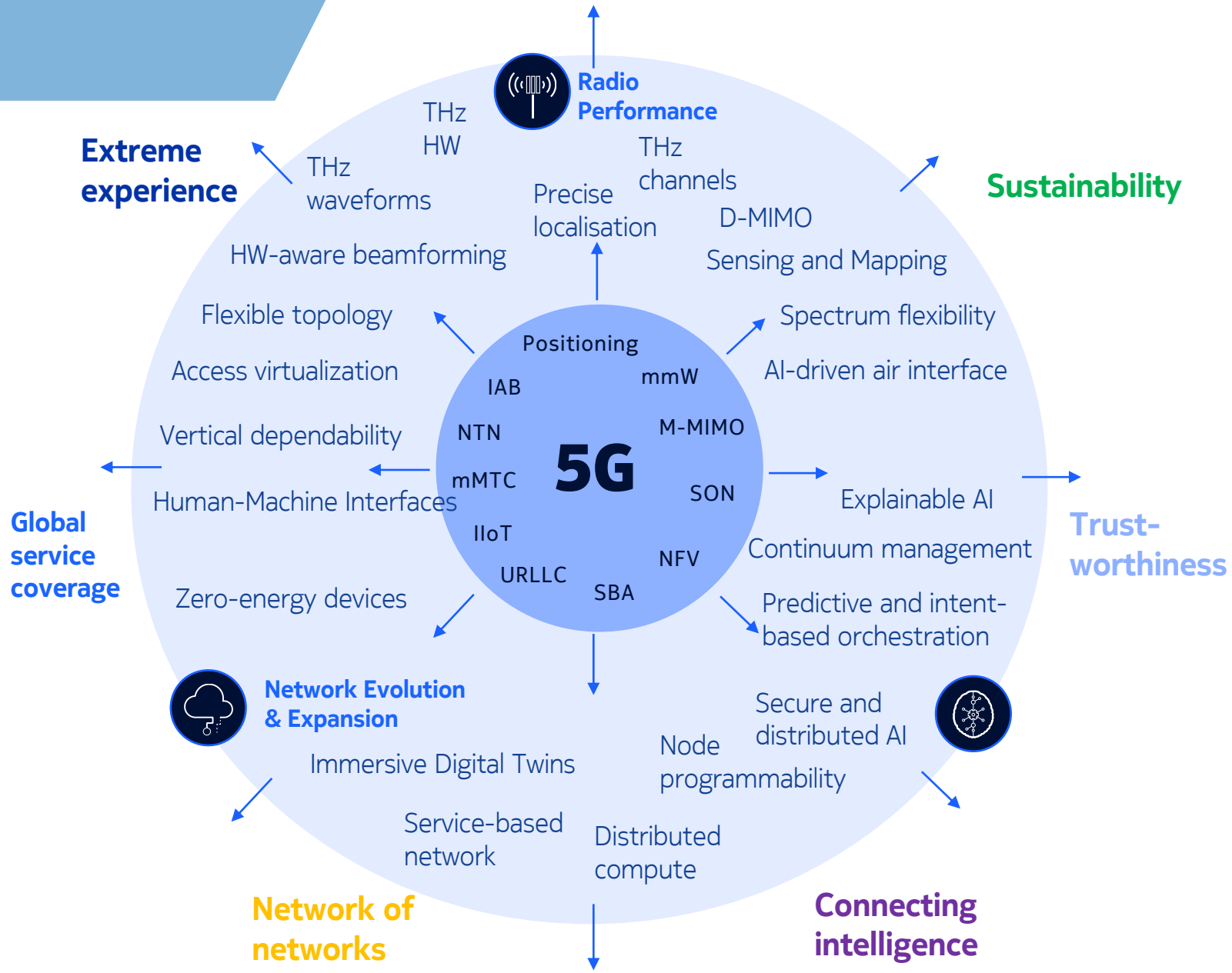
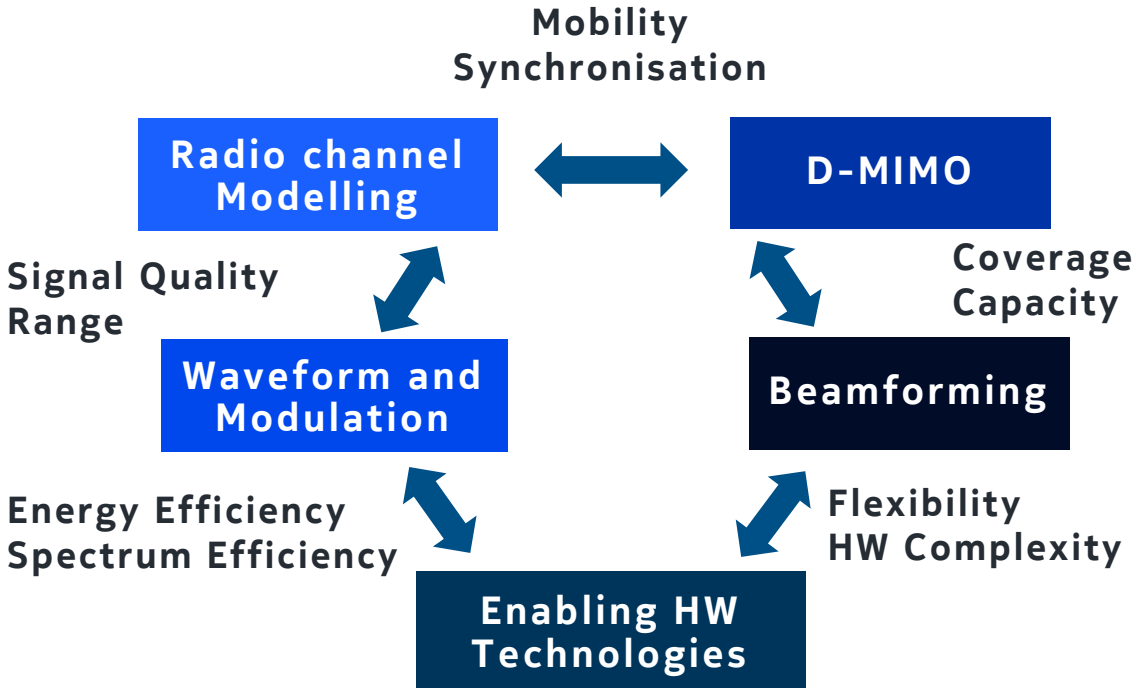


Ambitions

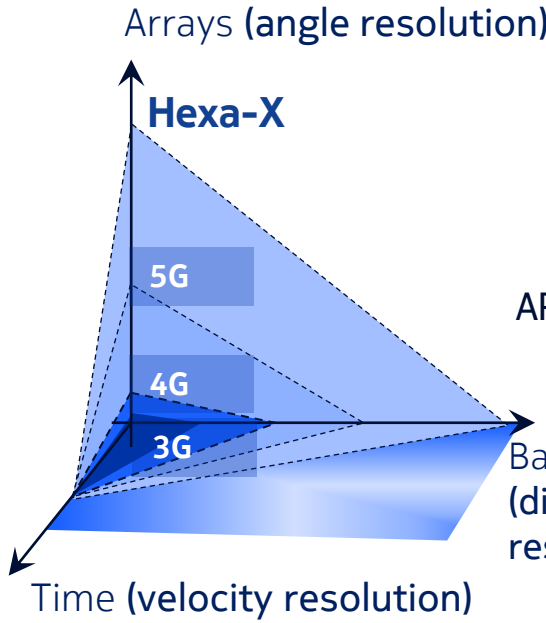

Radio Performance
THz HW
THz channels
Precise localisation
D-MIMO
Sensing and Mapping
Extreme experience
THz waveforms
HW-aware beamforming
Sustainability
Flexible topology
Spectrum flexibility
Access virtualization
AI-driven air interface
Positioning
IAB
mmW
NTN
M-MIMO
5G
Vertical dependability
mMTC
SON
Human-Machine Interfaces
Explainable AI
Trust-worthiness
Global service coverage
IIoT
Continuum management
NFV
URLLC
SBA
Zero-energy devices
Predictive and intent-based orchestration
Network Evolution & Expansion
Secure and distributed AI
Node programmability
Immersive Digital Twins
Service-based network
Distributed compute
Network of networks
Connecting intelligence

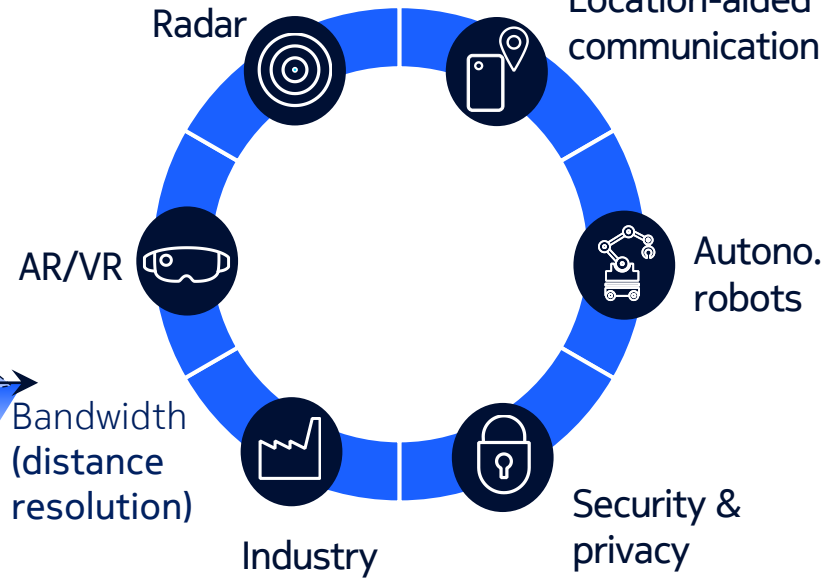
Radio performance towards 6G

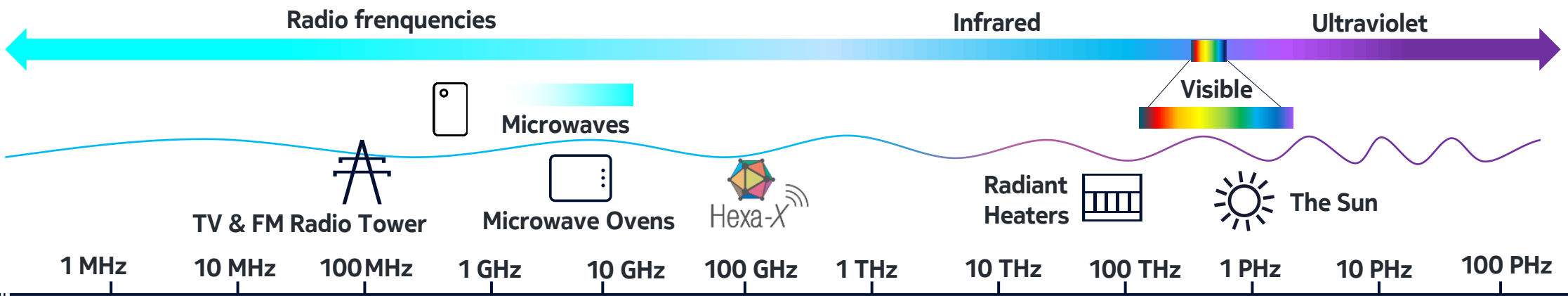
Towards Seemly Infinite Capacity and Data Rate



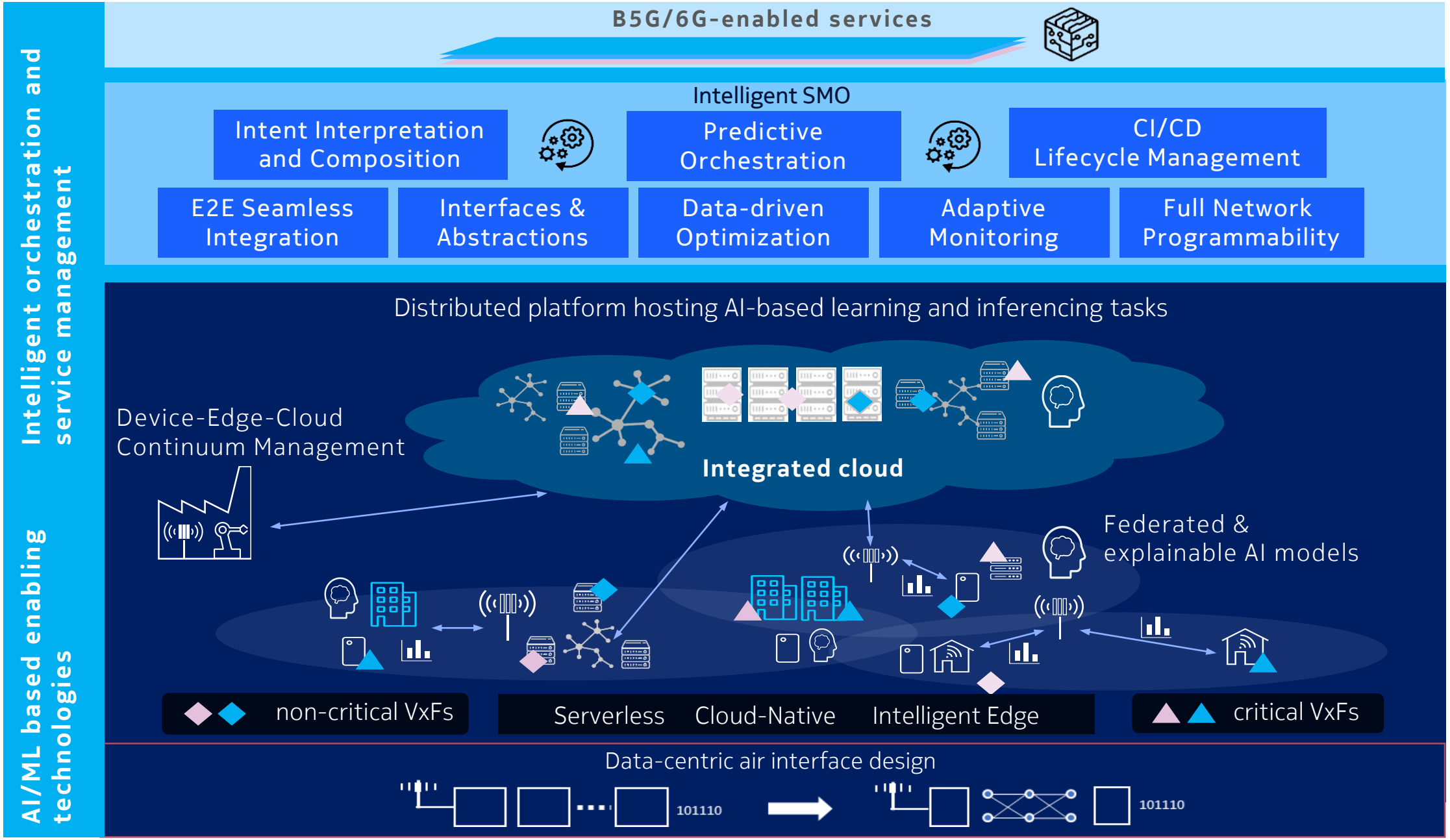
6D high-resolution localization and sensing



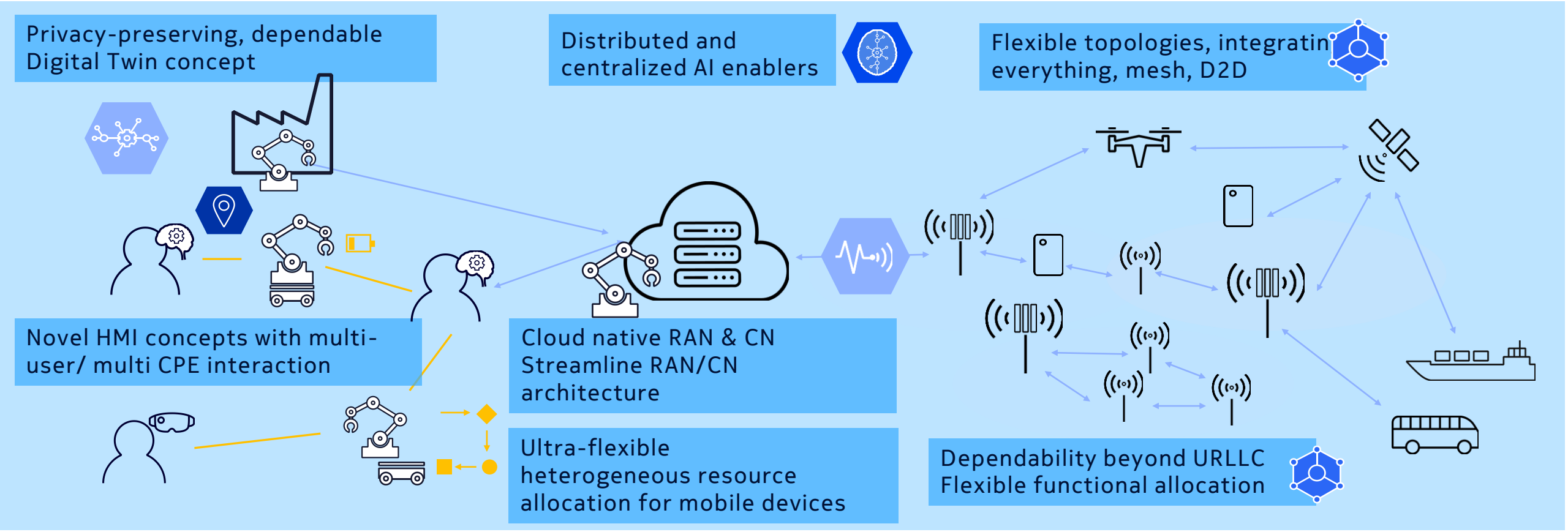




Connecting intelligence towards 6G



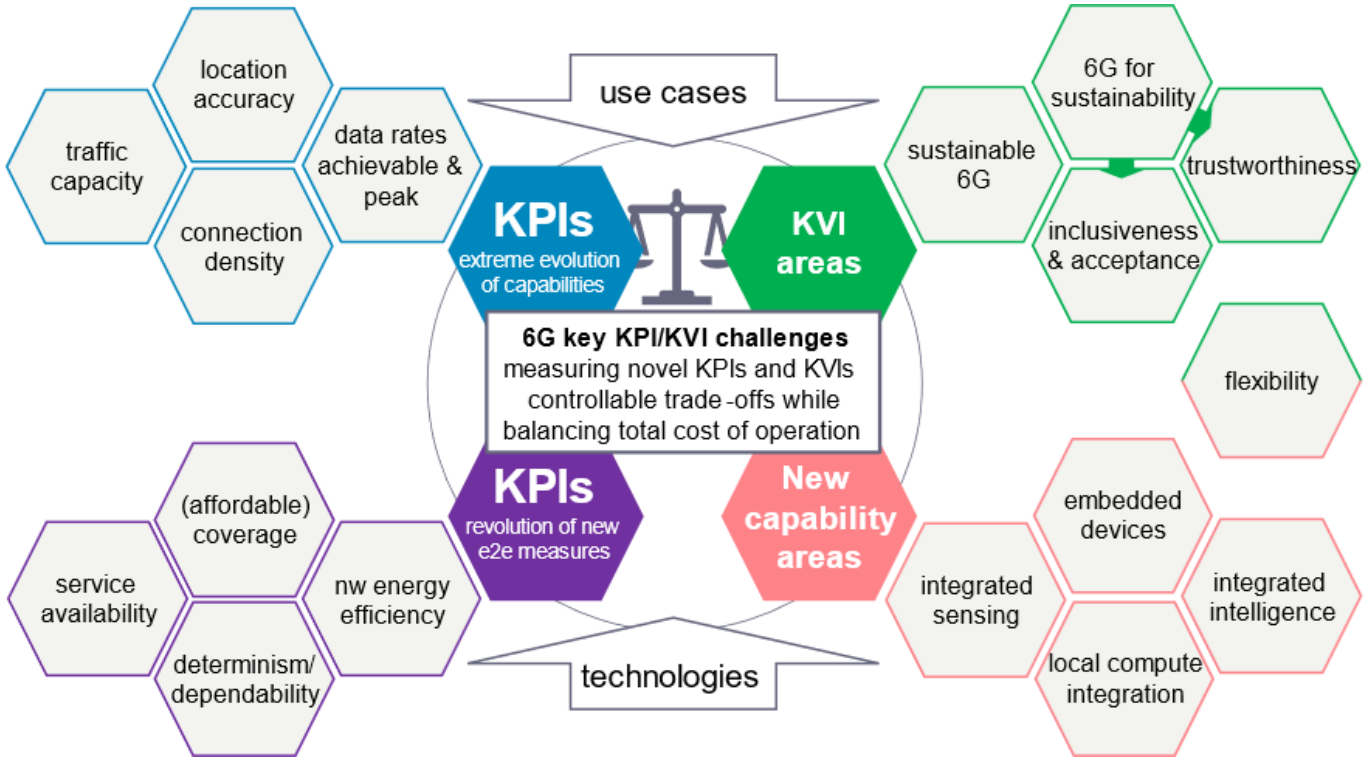
Network evolution and expansion towards 6G



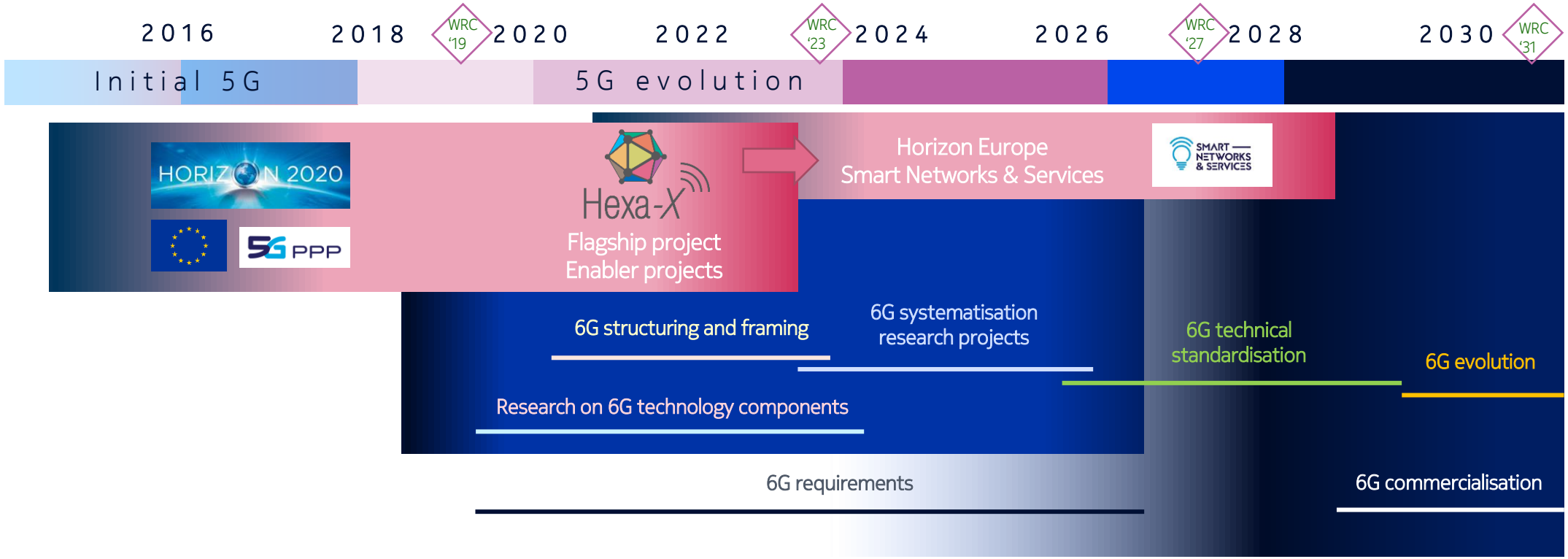
Key Value and Performance Indicators (KVIs/KPIs)

Identified KPIs, KVIs and new capability areas, and challenges

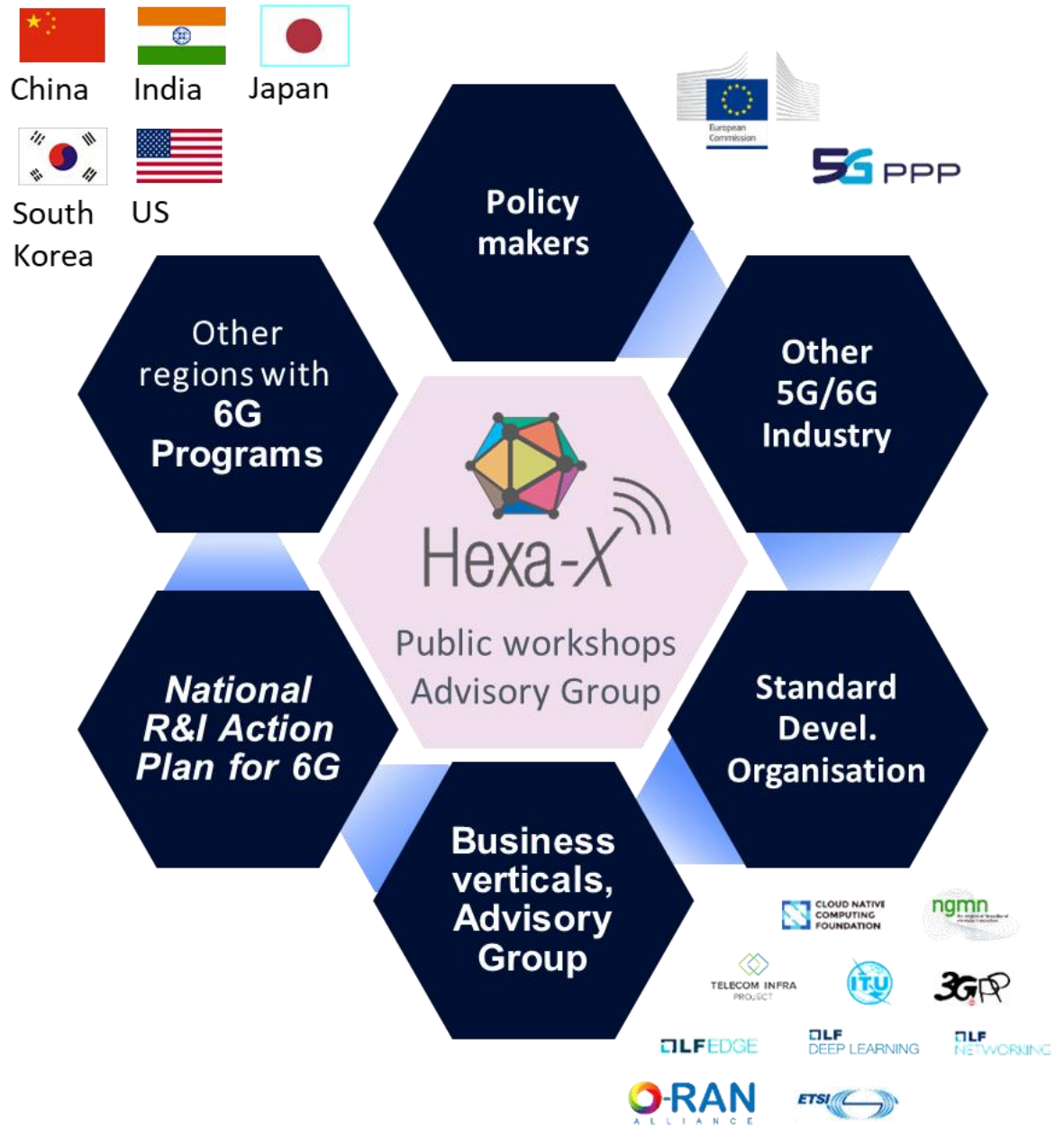
- Mission statement:
  - KPIs: extreme evolution and novel e2e measures
  - KVI areas to capture values and new capabilities
- Research challenges:
  - Advancing on existing KPIs
  - Redefinition of existing KPIs
  - New capabilities leading to new KPIs
  - Capturing societal needs
  - Measurability and complexity



Timeline


2016
2018
WRC '19
2020
2022
WRC '23
2024
2026
WRC '27
2028
2030
WRC '31
Initial 5G
5G evolution
HORIZON 2020
PPP
Hexa-X
Flagship project
Enabler projects
Horizon Europe
Smart Networks & Services
SMART NETWORKS & SERVICES
6G structuring and framing
6G systematisation research projects
6G technical standardisation
6G evolution
Research on 6G technology components
6G requirements
6G commercialisation

Relation of Hexa-X to major stakeholders.



Thank you!

HEXA-X.EU

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