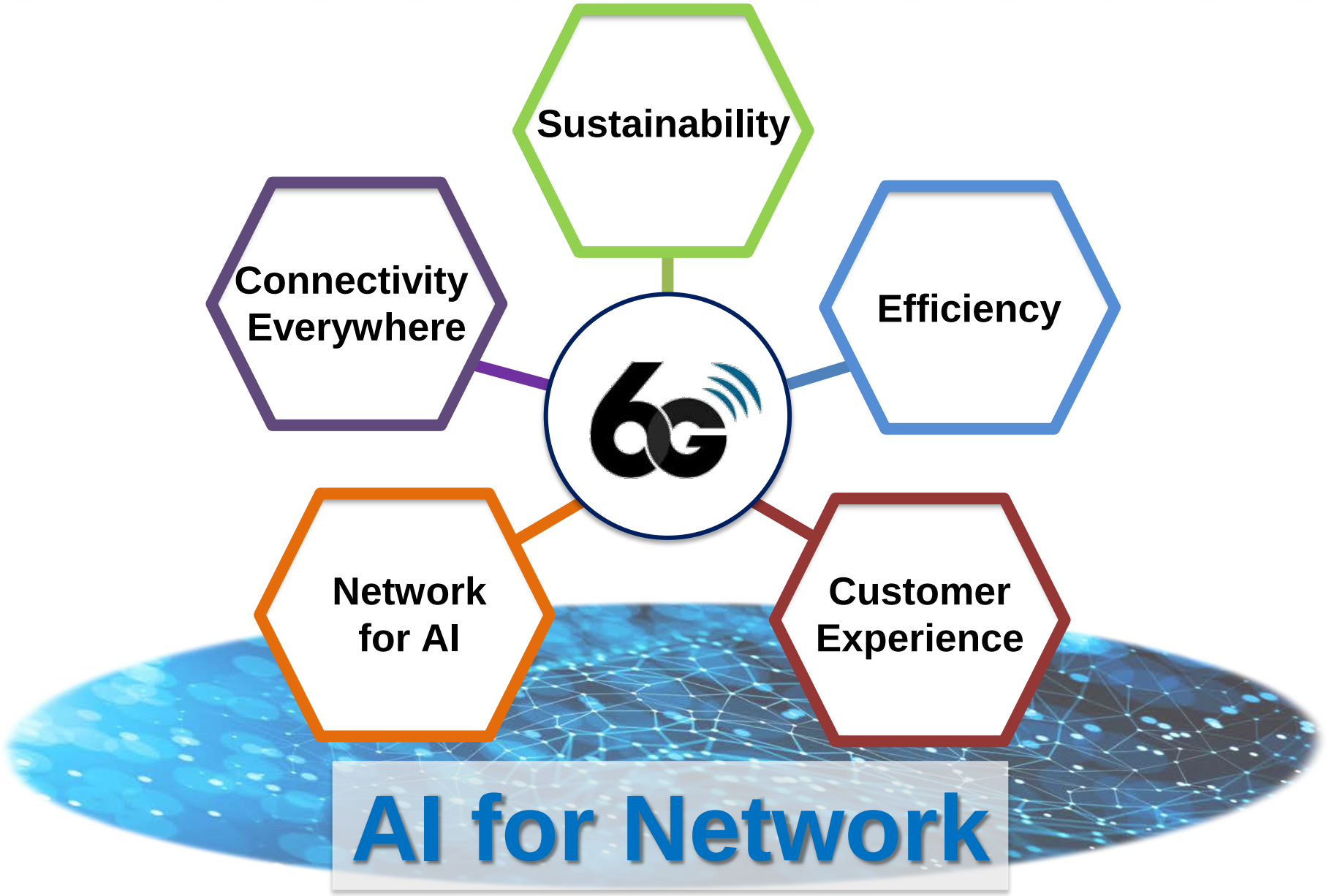
6G Technologies and Use Cases

Values of 6G


Sustainability
Connectivity Everywhere
Efficiency
6G
Network for AI
Customer Experience
AI for Network

1. Sustainability

Goals

- Carbon neutrality by 2030
- Net-Zero Emissions by 2040

Key Focus Areas

- AI-Driven network power saving
- Photonics-Electronics convergence (IOWN APN)

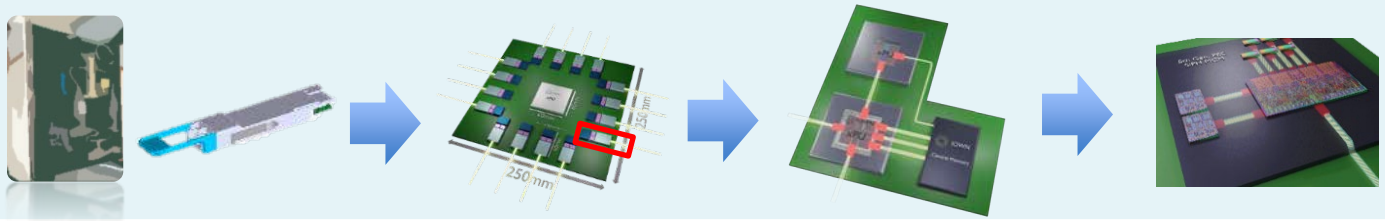
NTT's Innovative Optical and Wireless Network concept

Target Performance of All-Photonics Network(APN)

Power Efficiency	Transmission Capacity	End-to-End Delay
▼	▼	▼
100 times greater	125 times larger	Reduced to 1/200th

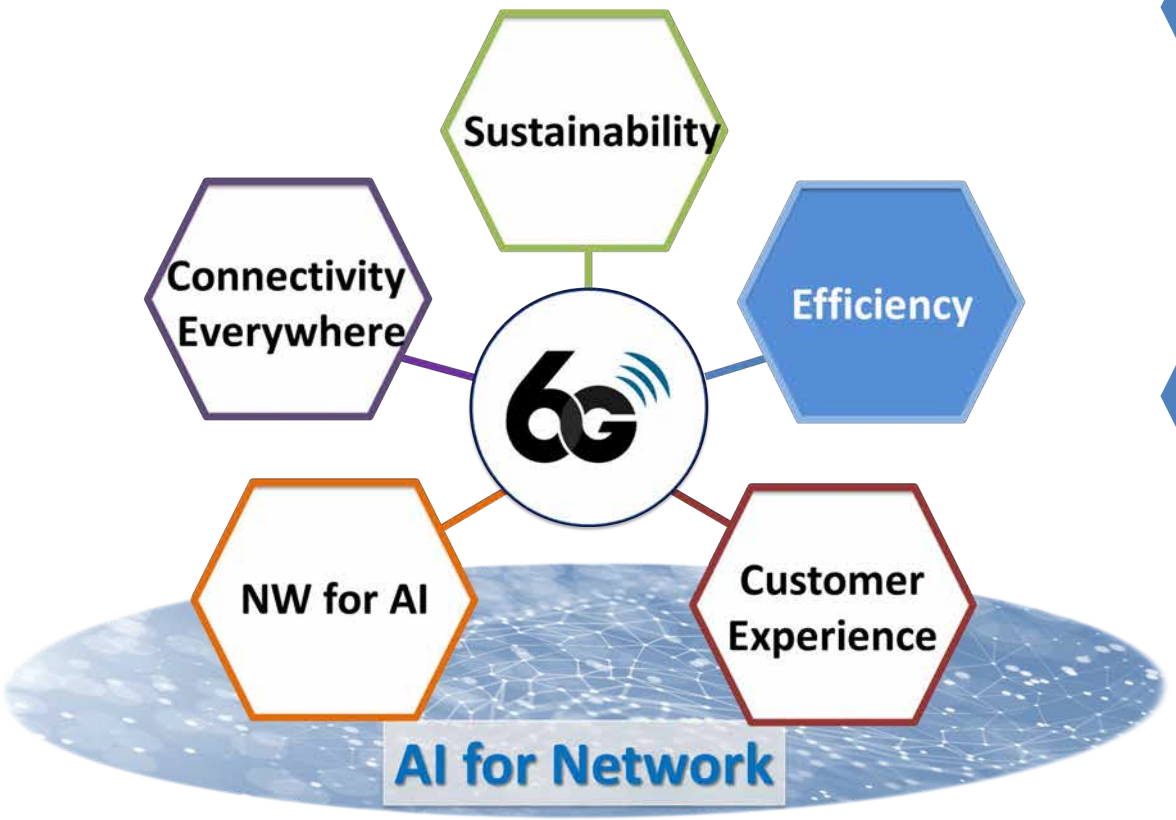
Key technology：Photonics-Electronics Convergence (PEC)

PEC devices



PEC-2　PEC-3　PEC-4

2. Efficiency



Goals

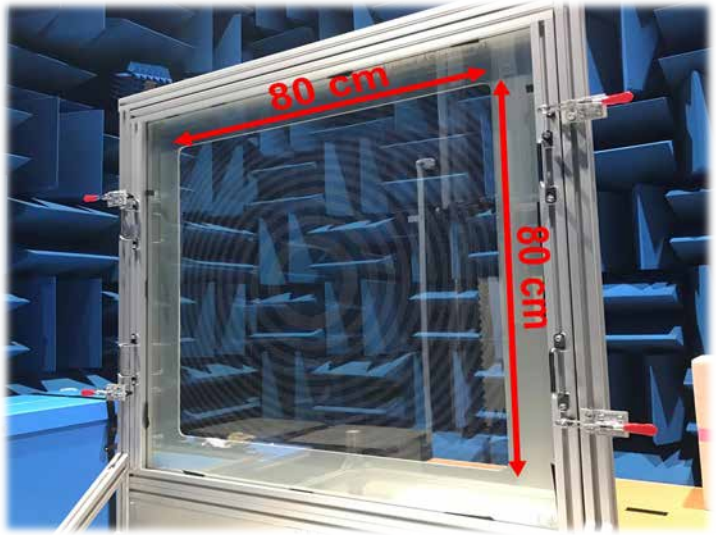
- **Cost reduction by streamlining systems and operations**

Key Focus Areas

- **Overall simplified design (vs. 5G)**
- **AI-driven automation & optimization**
- **Advanced radio access technologies**
  - Large-scale MIMO, AI-native RAN, Control signaling reduction, etc
- **Technologies for utilization of higher frequency bands**

Technologies for Higher Frequency Bands

Reconfigurable Intelligent Surface (RIS), Metasurface, Smart Repeater, Network digital twin, etc for FR3, milli-meter wave and sub-terahertz (sub-THz):



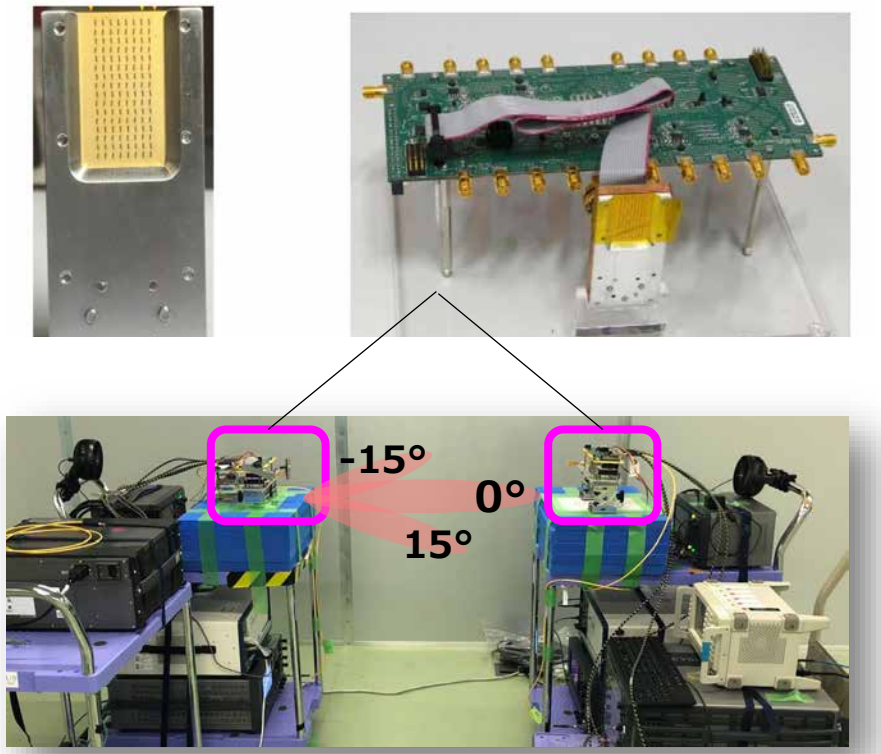
Metasurface-lens Windows

Reconfigurable Intelligent Surface (RIS)

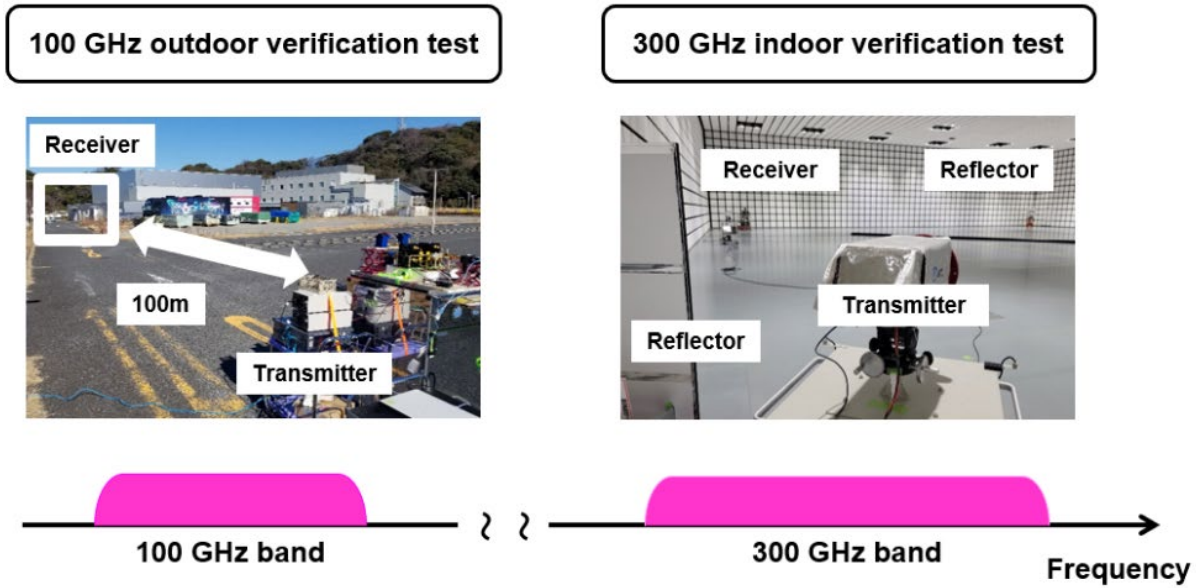
Network Digital twin
6G Real-time Simulator

Sub-terahertz Band Trials

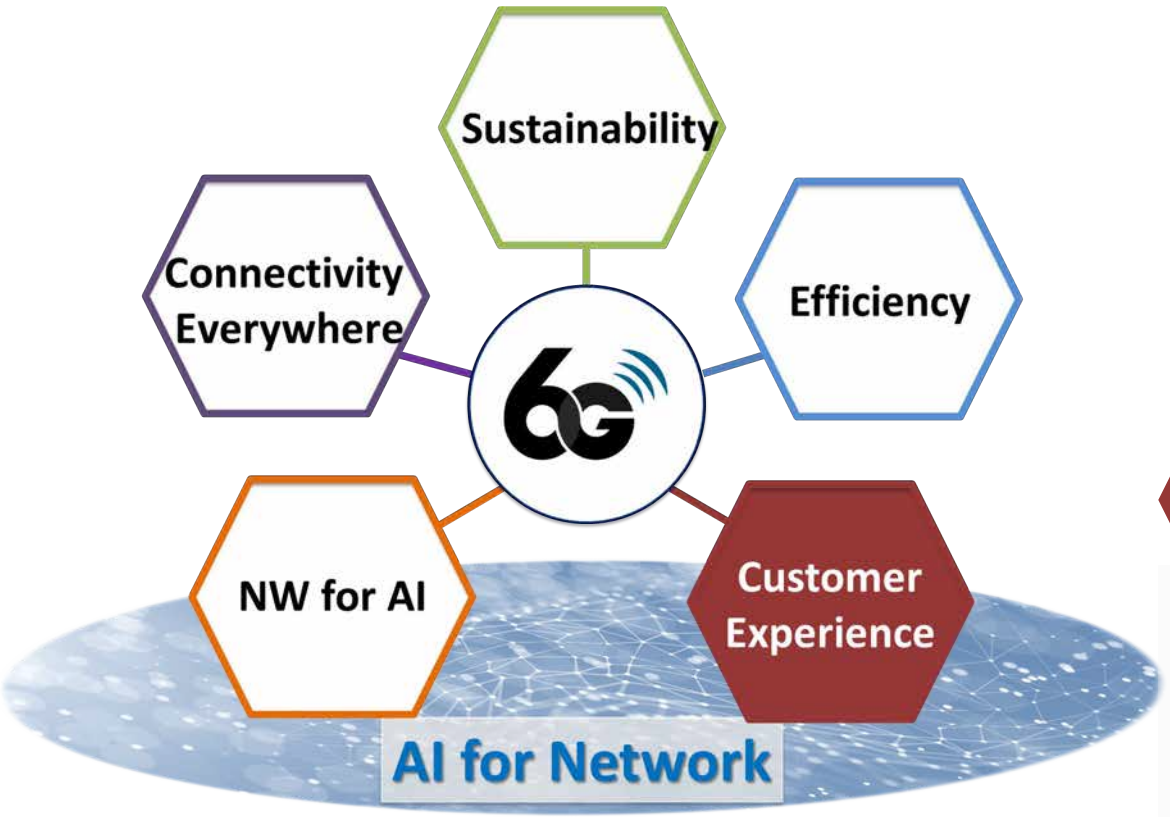
Joint Trial for 140GHz-band Using Nokia's 128-element Phased-array Antenna



DOCOMO, NTT, NEC and Fujitsu Jointly Developed Sub-terahertz 6G Device Capable Ultra-high-speed 100 Gbps Transmission



3. Customer Experience



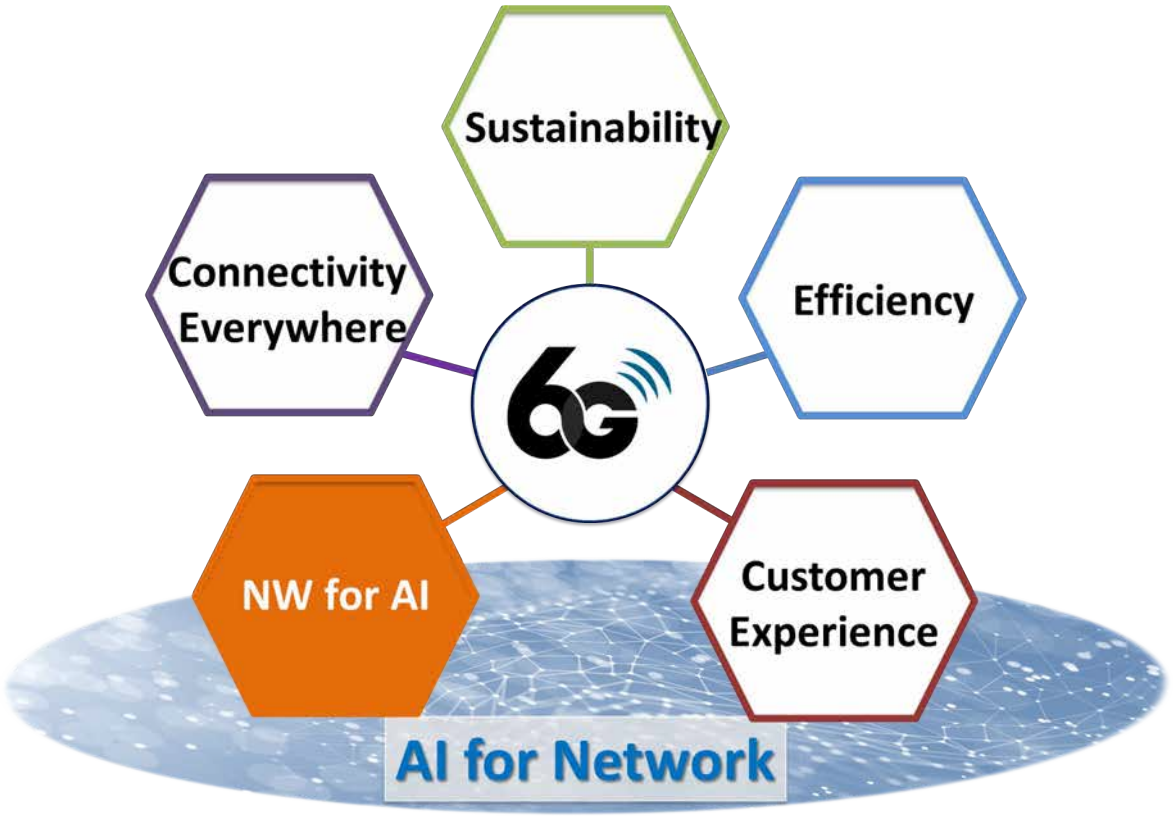
Goals

- Experiencing beyond visual & audio
- Excellent UX across all devices
- Blending the digital and physical worlds
- High-Reliability infrastructure

Key Focus Areas

- FEEL TECH: Five-sense communication technology
- Computing resource optimization
- Integrated Sensing & Communication
- Resilient networks

4. Network for AI



Goals

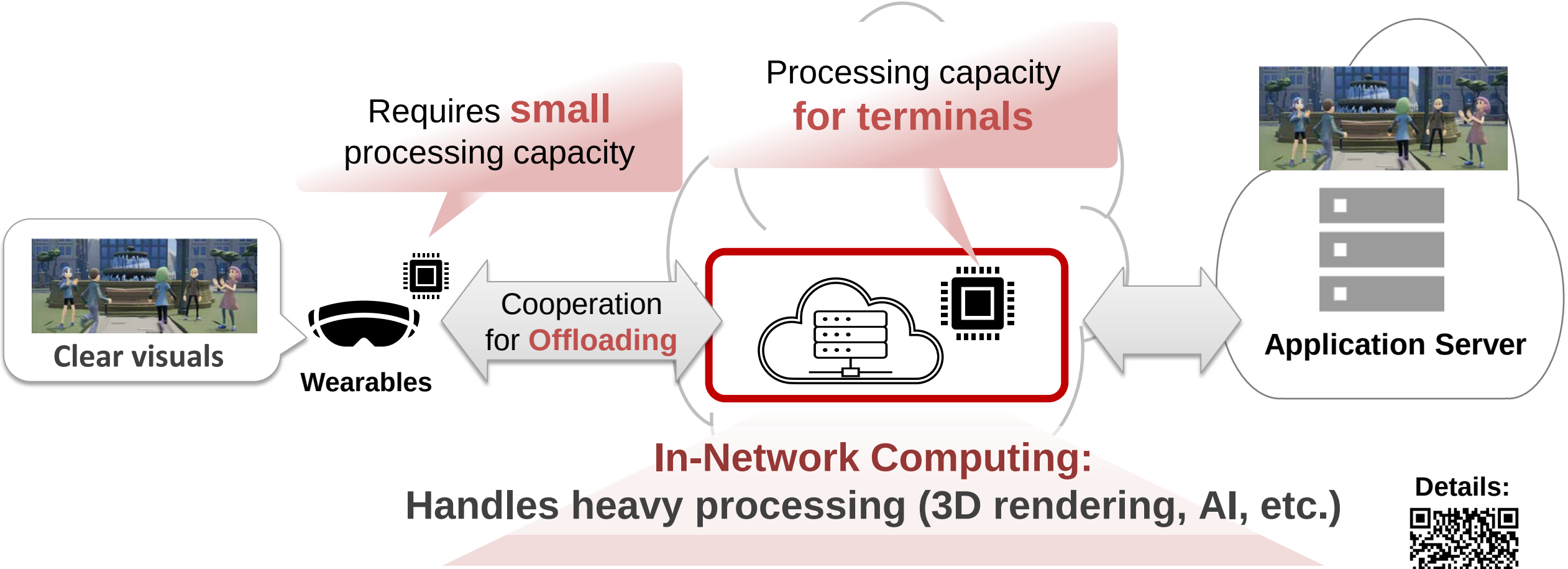
- Expanding beyond human-centric use cases
- Unlocking new revenue streams with AI & robotics

Key Focus Areas

- Maximizing AI value: Computing, network & data
- Enhanced Performance: Greater speed, capacity, low latency & high reliability

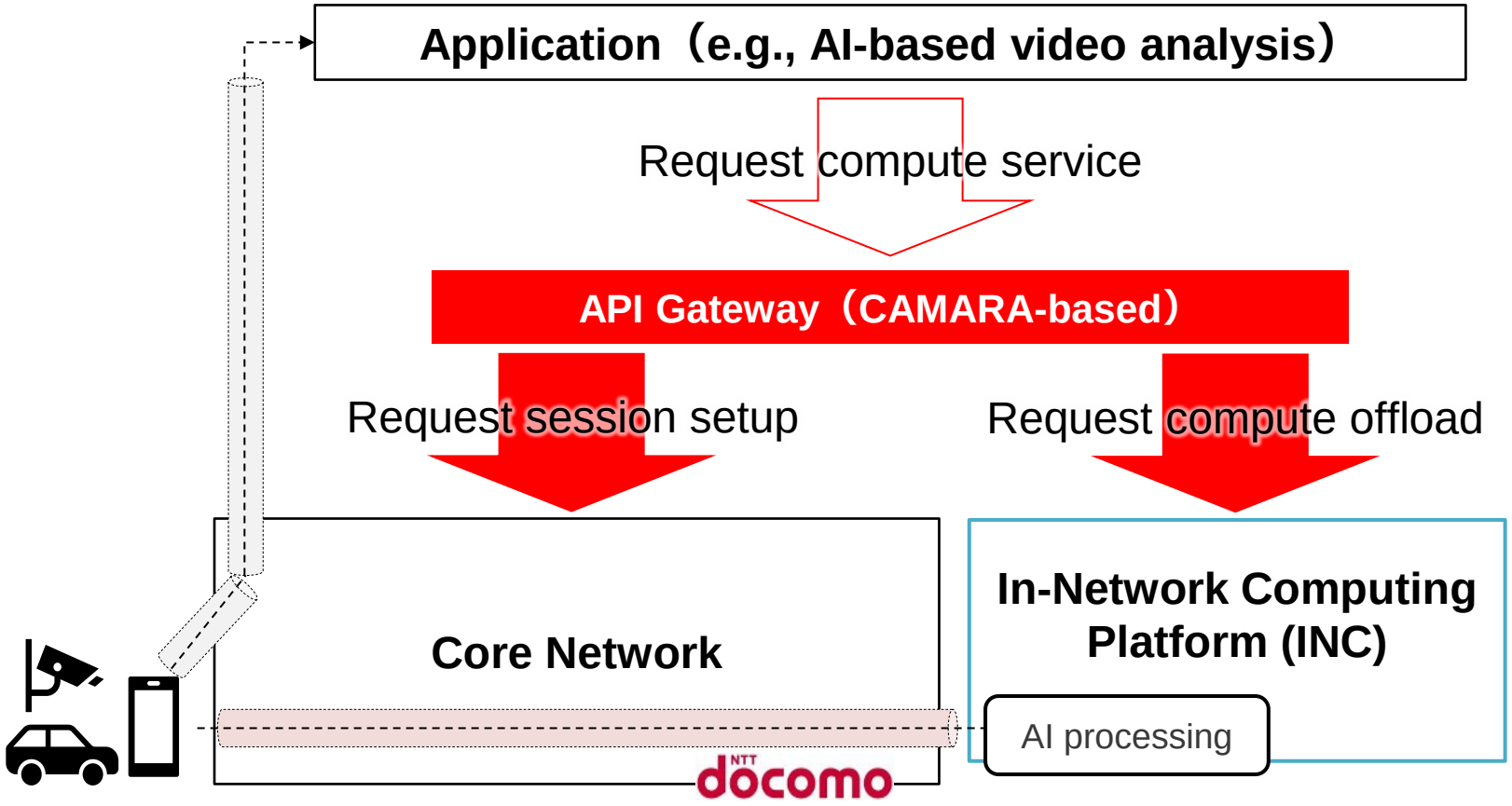
In-Network Computing Technology

Providing high-quality services by offloading terminal processing to the network systems



Details:

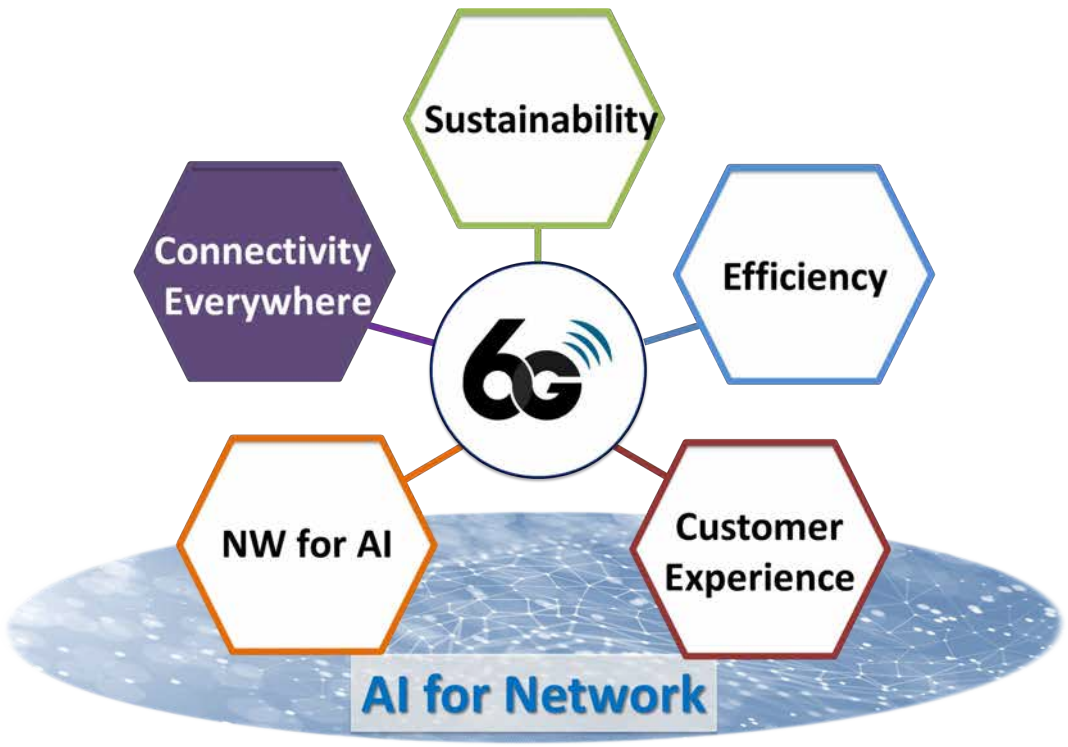
Experimental Demonstration of In-Network Computing



Triggered by requests through the CAMARA API GW, we have successfully enabled the use of INC during periods of high-load processing on end-user devices

In-Network Computing demonstration is exhibited at Nokia booth in space #3B20, Hall 3

5. Connectivity Everywhere



Goals

- Seamless connectivity everywhere

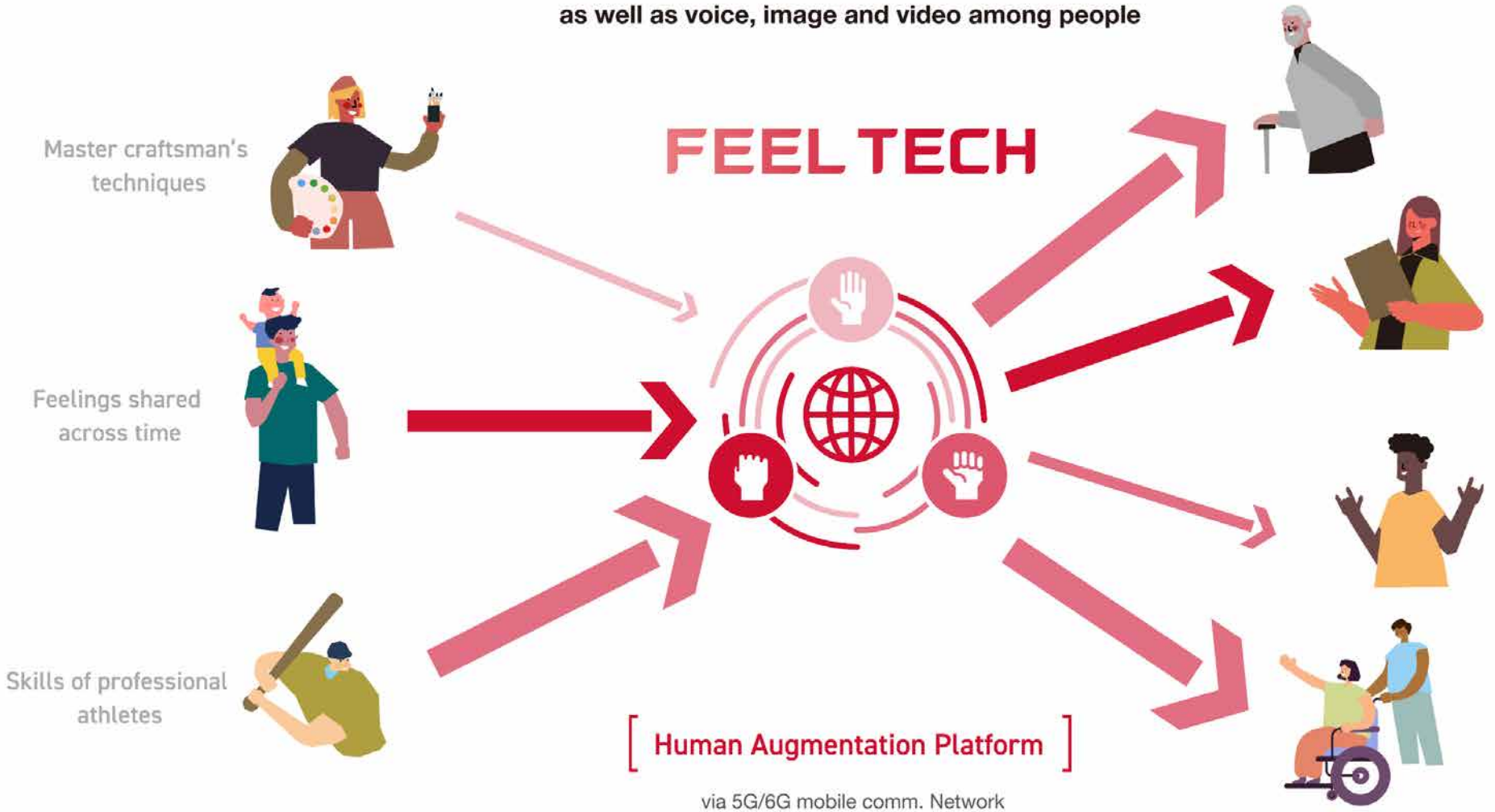
Key Focus Areas

- Optimized Connectivity Mix:
  LEO / GEO / HAPS / Terrestrial Networks
- Coverage Expansion:
  Direct Access & IoT
- Underwater Communication

FEELTECH

Sharing emotions and sensations

as well as voice, image and video among people



FEEL TECH

Comparison and adjustment of differing human body data	Expansion / reduction of sensory / motion range	Device interconnectivity	Device connectivity simplified with SDK

Human Augmentation Platform

Sensing

Device — App / SDK
Device — App / SDK
Device — App / SDK

Human Augmentation Platform

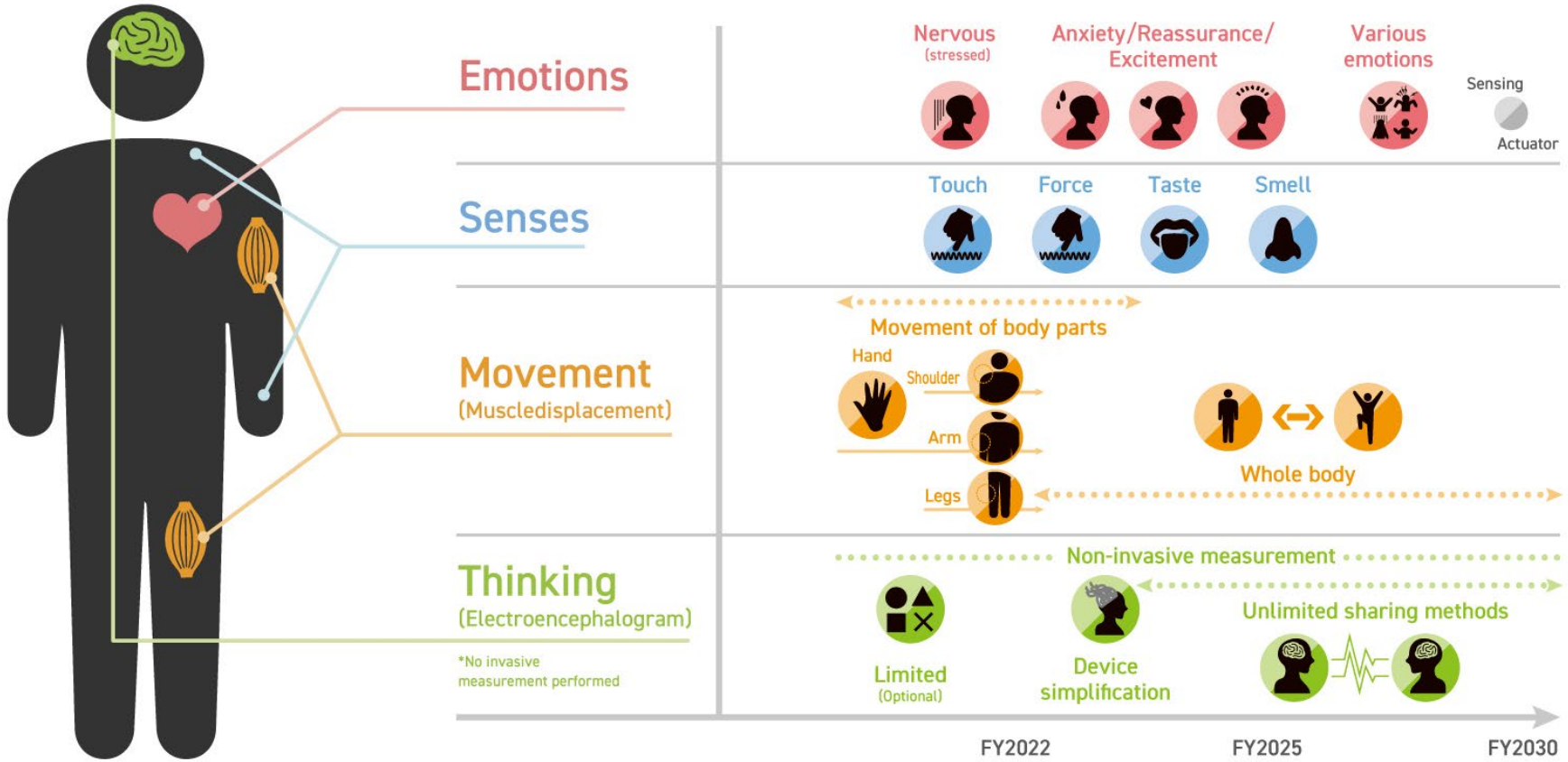
- Body data comparison
- Device capability conversion
- Sensory recording
- Sensory reproduction
- Database
  - Body data
  - Sensor data
  - Operational data

Actuation

App / SDK → Device
App / SDK → Device
App / SDK → Device

FEEL TECH

Initiatives



TOPPAN and DOCOMO Agree to Innovate Next-Generation 6G Services Using FEEL TECH Communication Technology

Education

Provision of learning opportunities that foster independent exploration (e.g., inquiry-based learning, entrepreneurship education)

A sensory-sharing virtual learning experience without constraints

Skill Transmission

(Manufacturing sites, traditional craftsmanship, etc.)

Inclusive Shopping Experience

...

TOPPAN's Metapa®

The fusion of real and virtual worlds in the metaverse

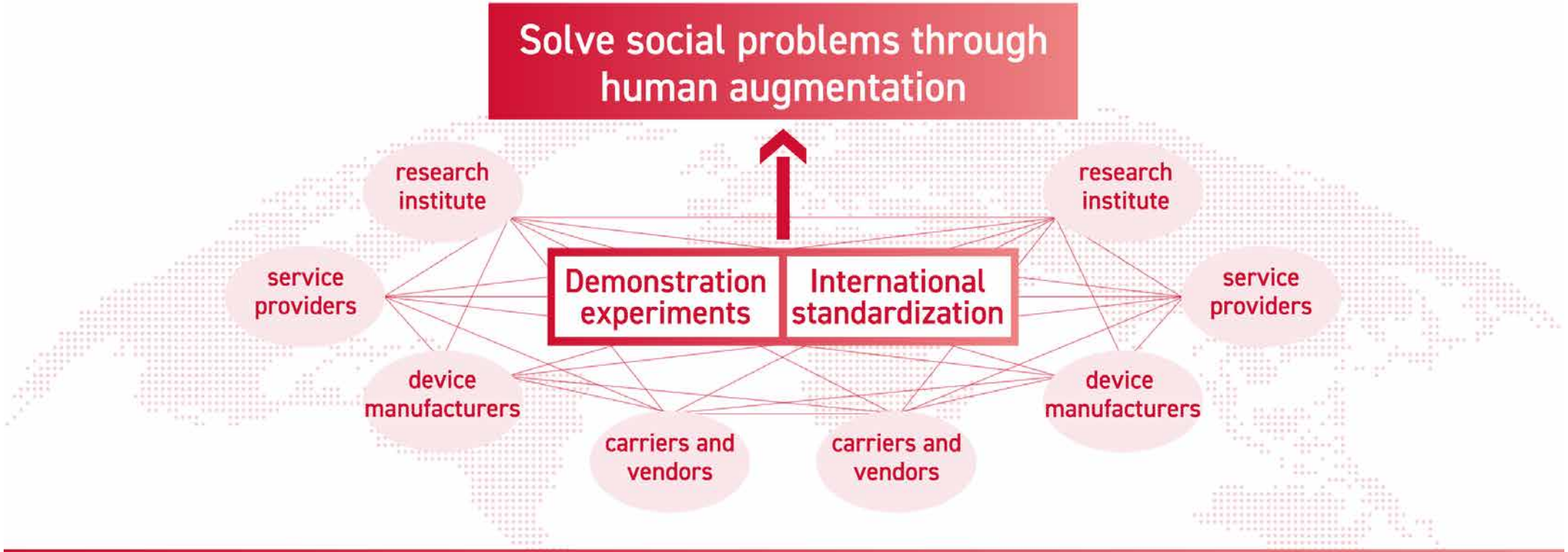
×

NTT DOCOMO's FEEL TECH®

Next-generation communication technology for the 6G era

FEEL TECH

Global Introduction of the Human Augmentation Consortium



CONTACT US FOR MORE INFO ABOUT THE CONSORTIUM: contact@human-aug.com

Bridging Worlds

for Wonder & Happiness

NTT docomo