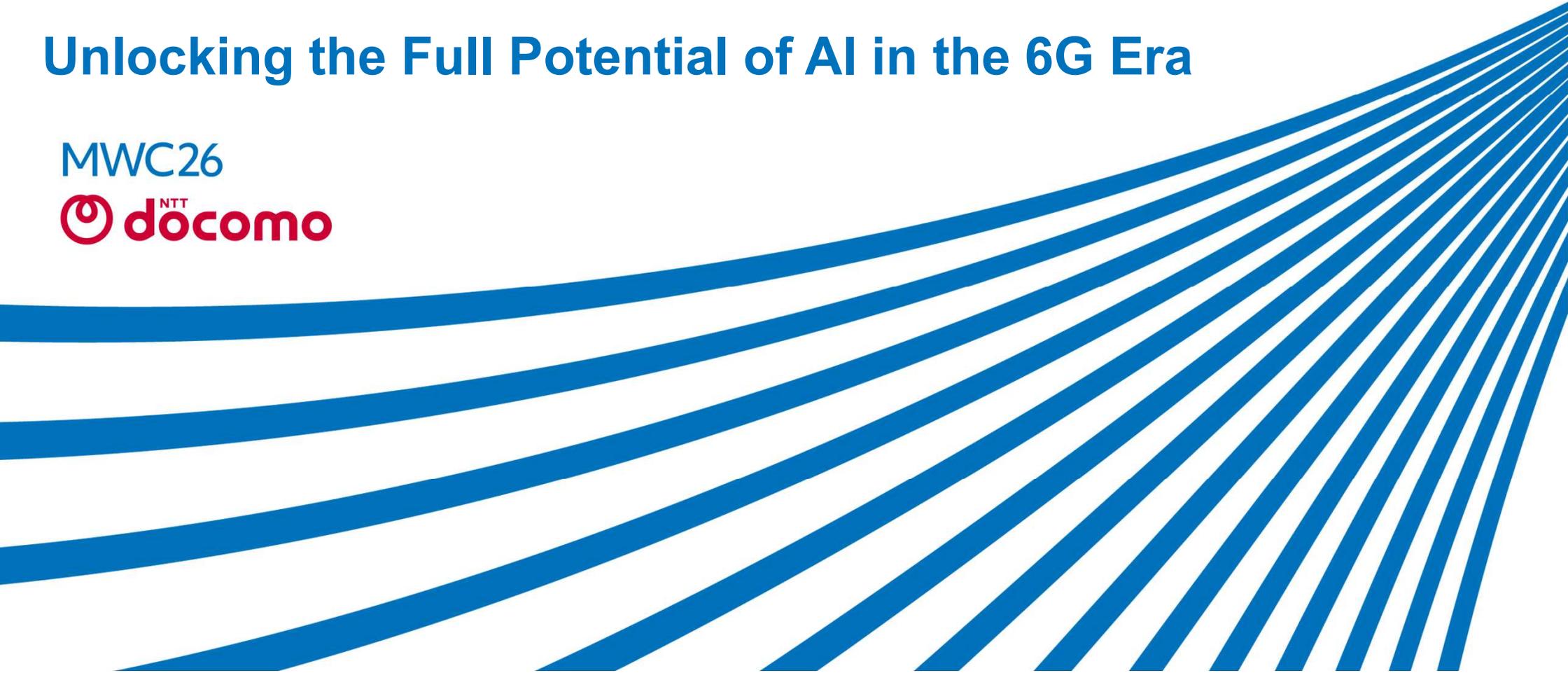


# 6G and AI-Centric Network

Unlocking the Full Potential of AI in the 6G Era

MWC26



CONTENT

01 **NTT DOCOMO's 6G vision**

02 **Network for AI**

03 **AI for Network**

01

# NTT DOCOMO's 6G Vision

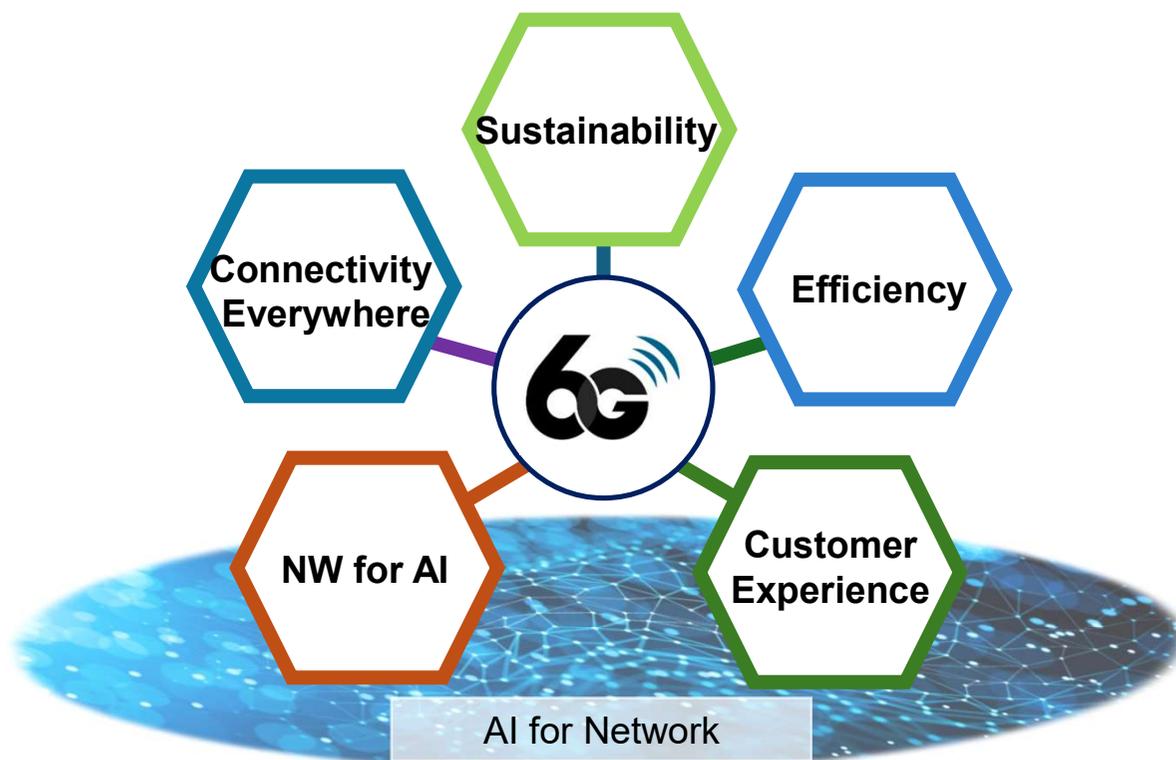
# Japan is confronting social issues:

- Population decline and aging
- Labor shortage
- Severe natural disasters

Efficient/effective network, full AI/robot utilization  
are strongly needed

# NTT DOCOMO's 6G Vision

- We propose **6G vision** with an AI-centric network
- Analyzing mobile operator initiatives and challenges while exploring new opportunities for AI and Data-driven innovation

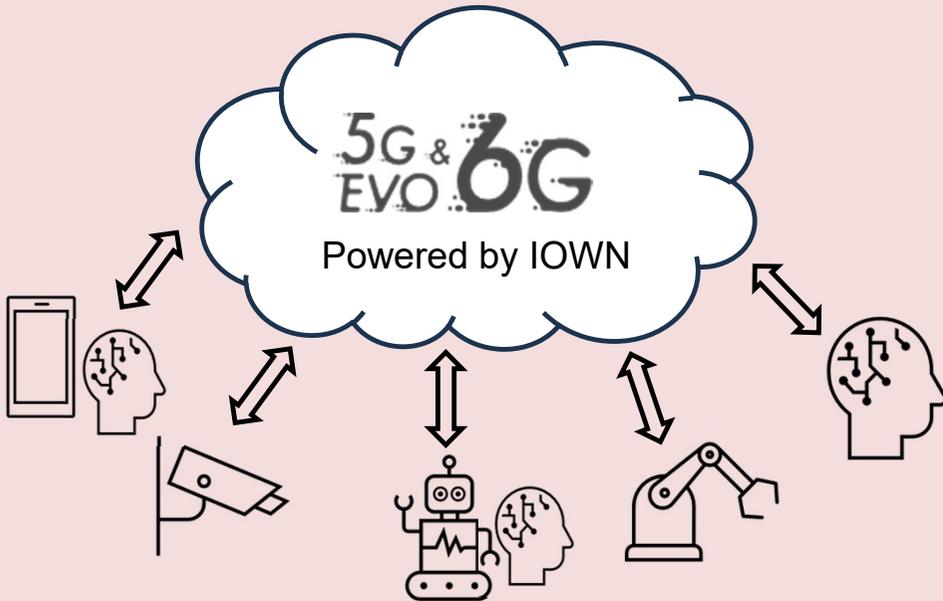


NTT DOCOMO's 6G vision

# AI-Centric Network

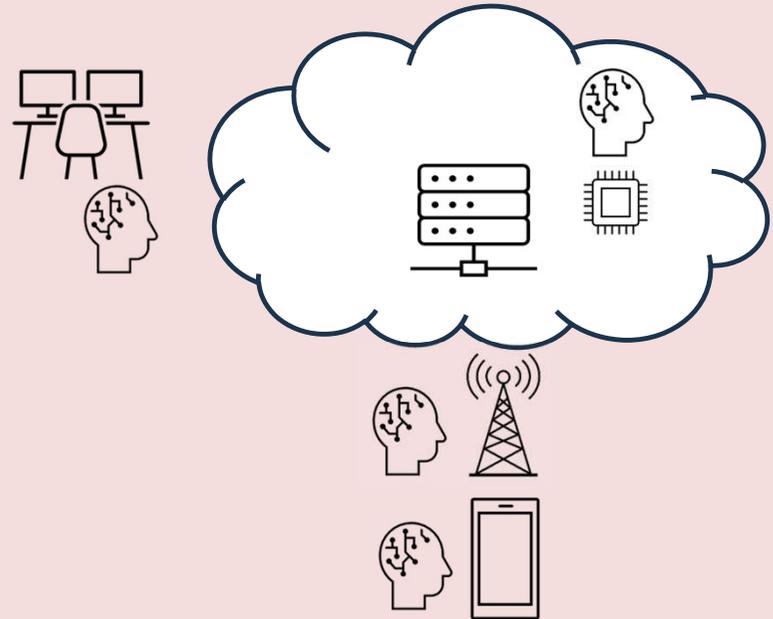
## Network for AI

Unlocking AI's Full Potential  
Across the Network



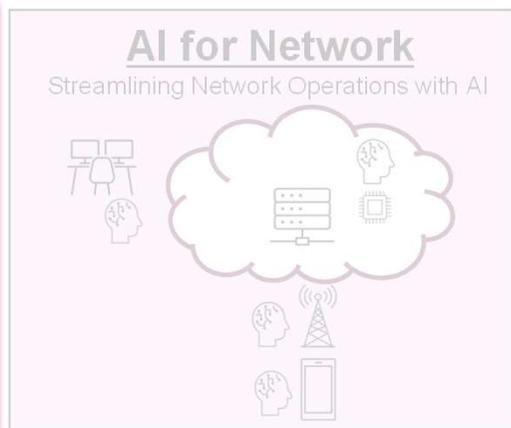
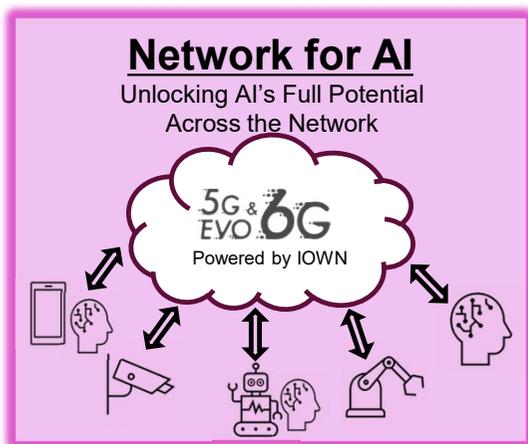
## AI for Network

Streamlining Network Operations with AI



# 02

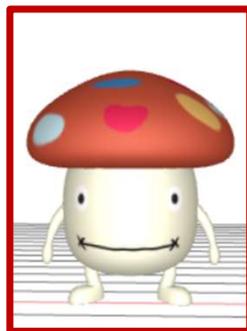
## Network for AI



# 6G Harmonized Intelligence Project

- Thanks to AI/robot experts' ideas, we developed some prototypes considering the future 6G requirements
- These prototypes are showcased in our stand

## Sensor-less Robots



External cameras, sensors, etc.

Immersive, hyper reliable and low-latency communication

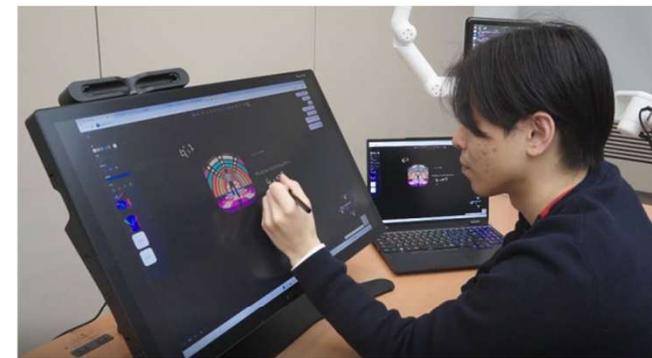
## Autonomous Symbiotic Robot



Autonomous symbiosis

Ubiquitous connectivity, low-power, massive, hyper reliable and low-latency communication

## Human-AI Interaction in AGI/ASI Era



Real-time learning and inference AI

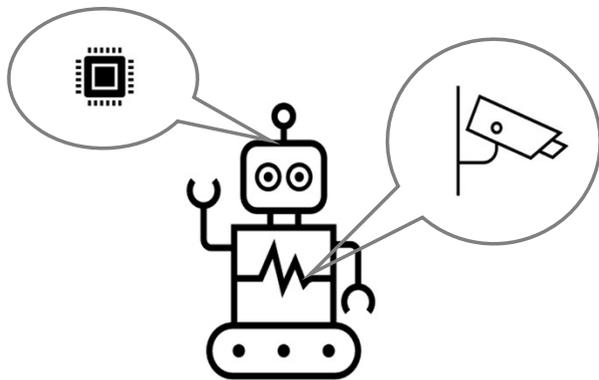
immersive, hyper reliable and low-latency communication

# Sensor-less Robots

- 6G will shift sensing and intelligence to the network
- This enables **simpler, flexible, and scalable sensor-less robots**

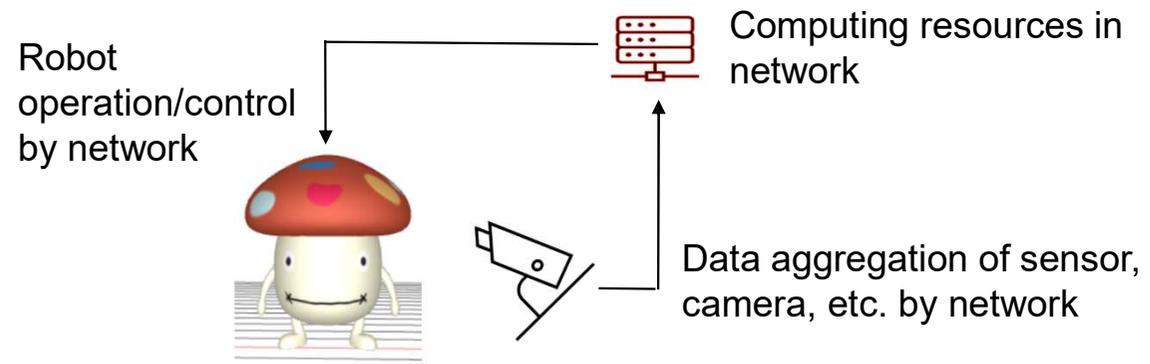
## Conventional Robots

- On-board sensors, cameras
- Rigid, metallic robot structure



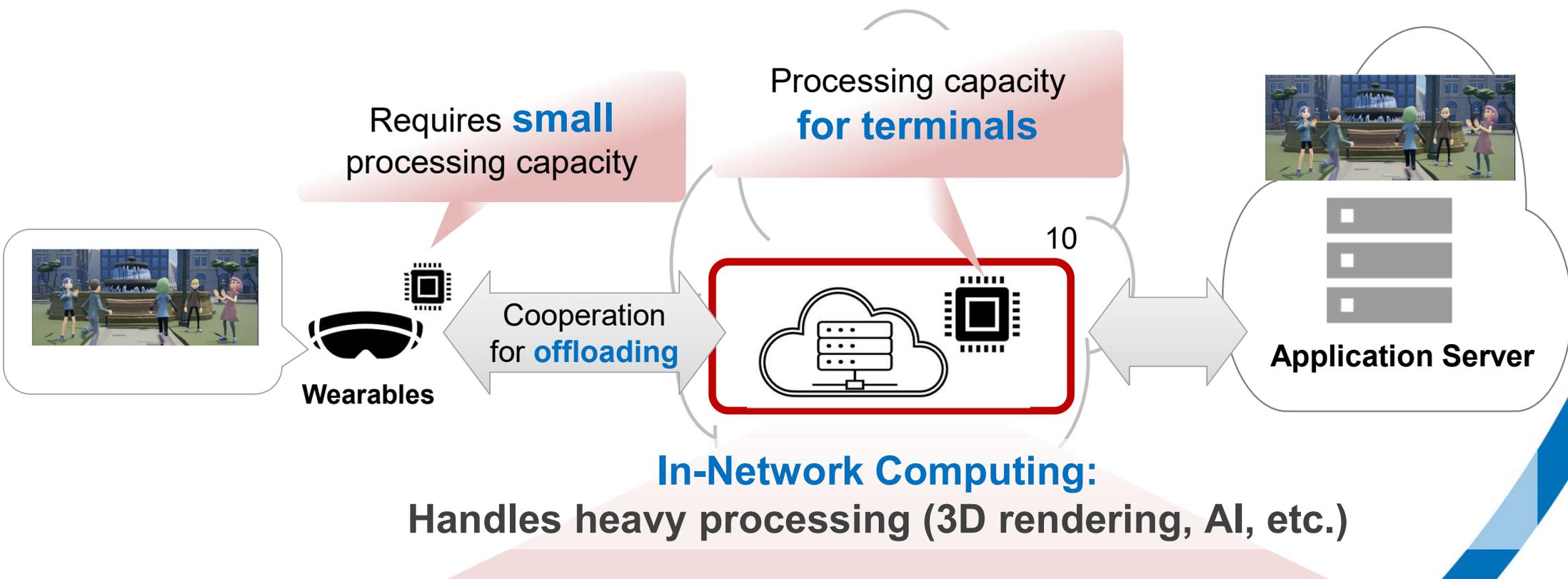
## 6G-Era: Sensor-less Robots

- Minimal on-board sensors, computation
- Soft, flexible robot structure



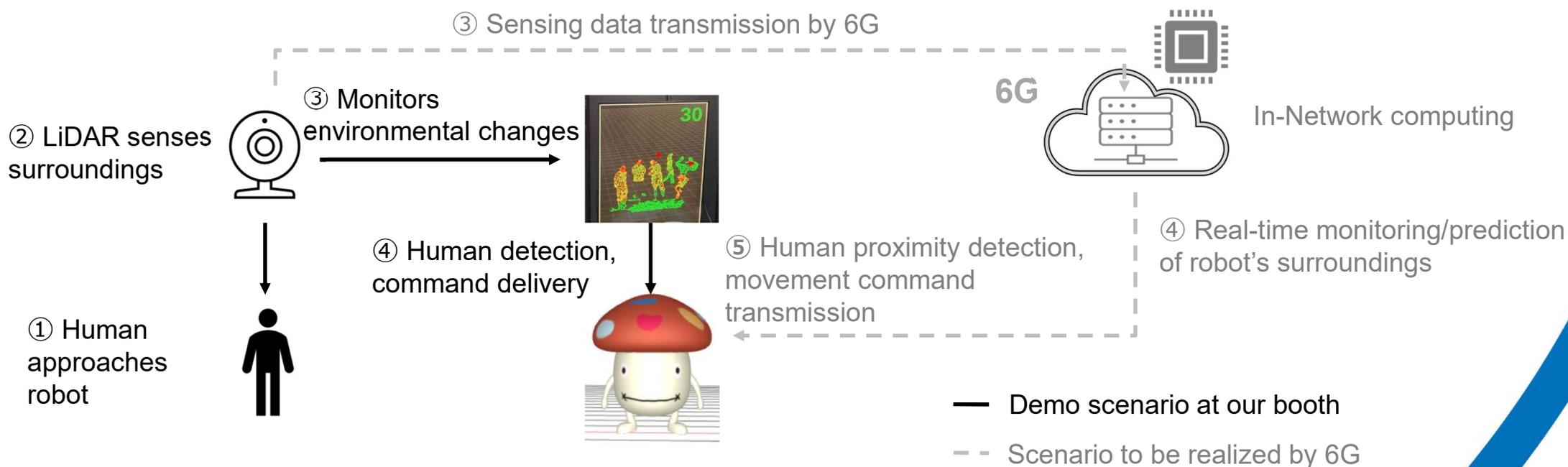
# In-Network Computing

- Shift heavy processing capacity from terminals to the network



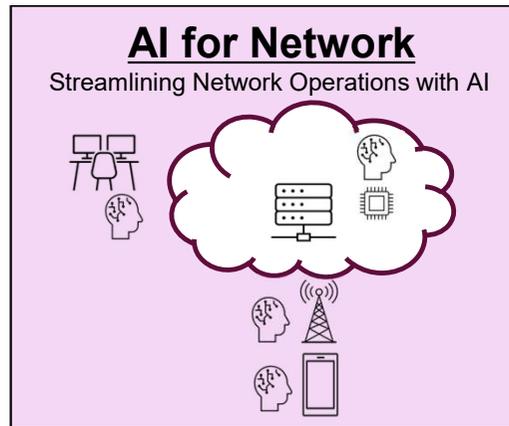
# Sensor-less Robot Demo in MWC2026

- By processing camera/sensors data directly within the network, **robot operates without on-board sensors or computers, enabling real-time human detection and smooth movement control**



# 03

## AI for Network



# R&D Vision of AI for Network

- 6G will integrate optical and quantum computing into the network to enable **autonomous operation, extreme reliability, and data-driven service optimization**

Zero Human Error



Autonomous network operation

Zero Outage



Quick recover from large scale disaster and abnormal accident

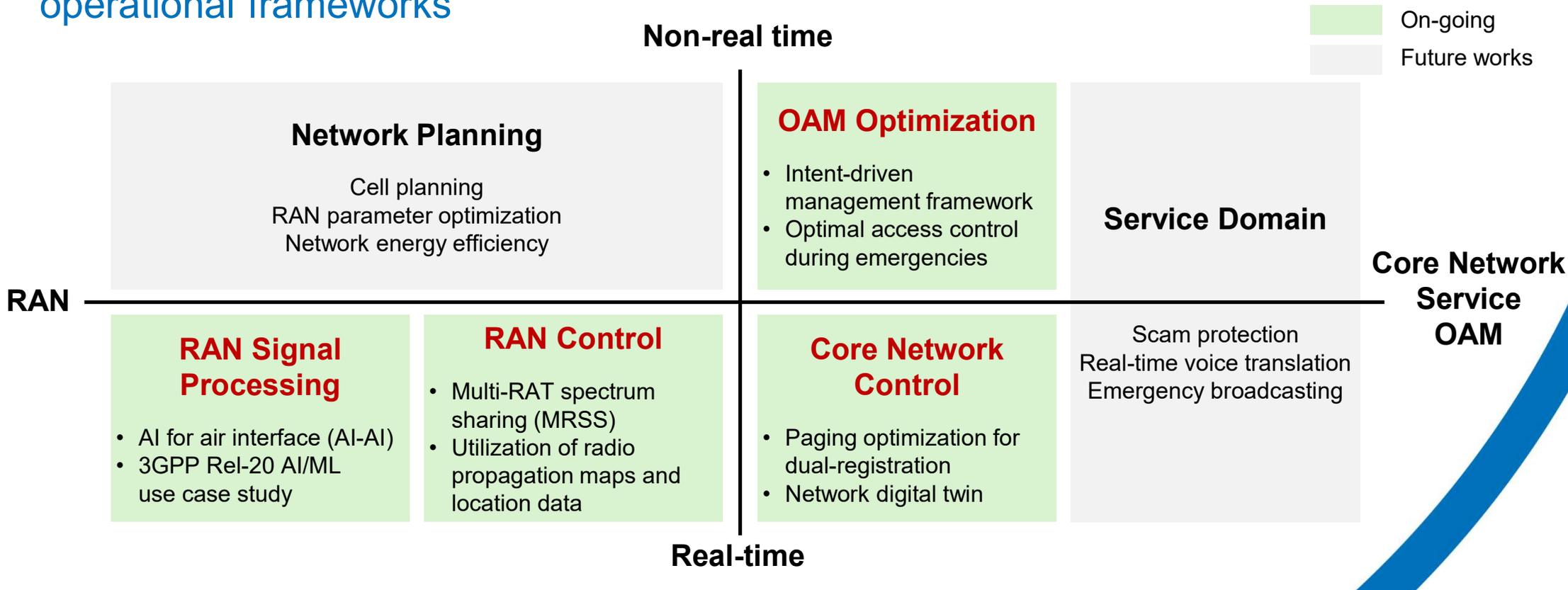
Maximize User Experience



Data-driven quality improvement

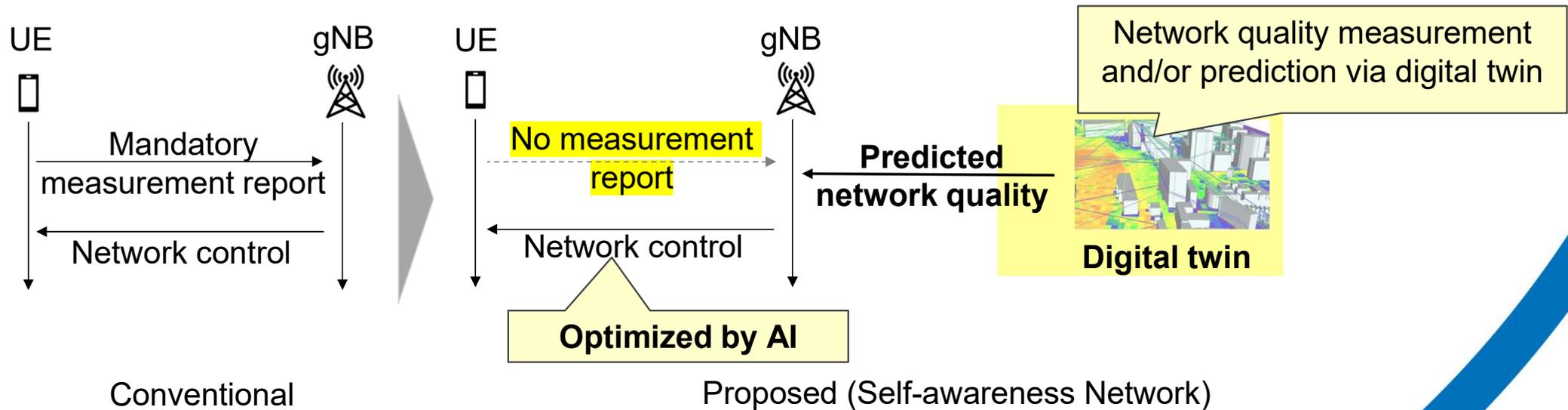
# R&D Scope of AI for Network toward 6G

- Identify areas where **AI/Data can deliver significant impact** across RAN, CN, and OAM (especially for network operators)
- Collaborate across domains** to strengthen AI/ML foundations and operational frameworks



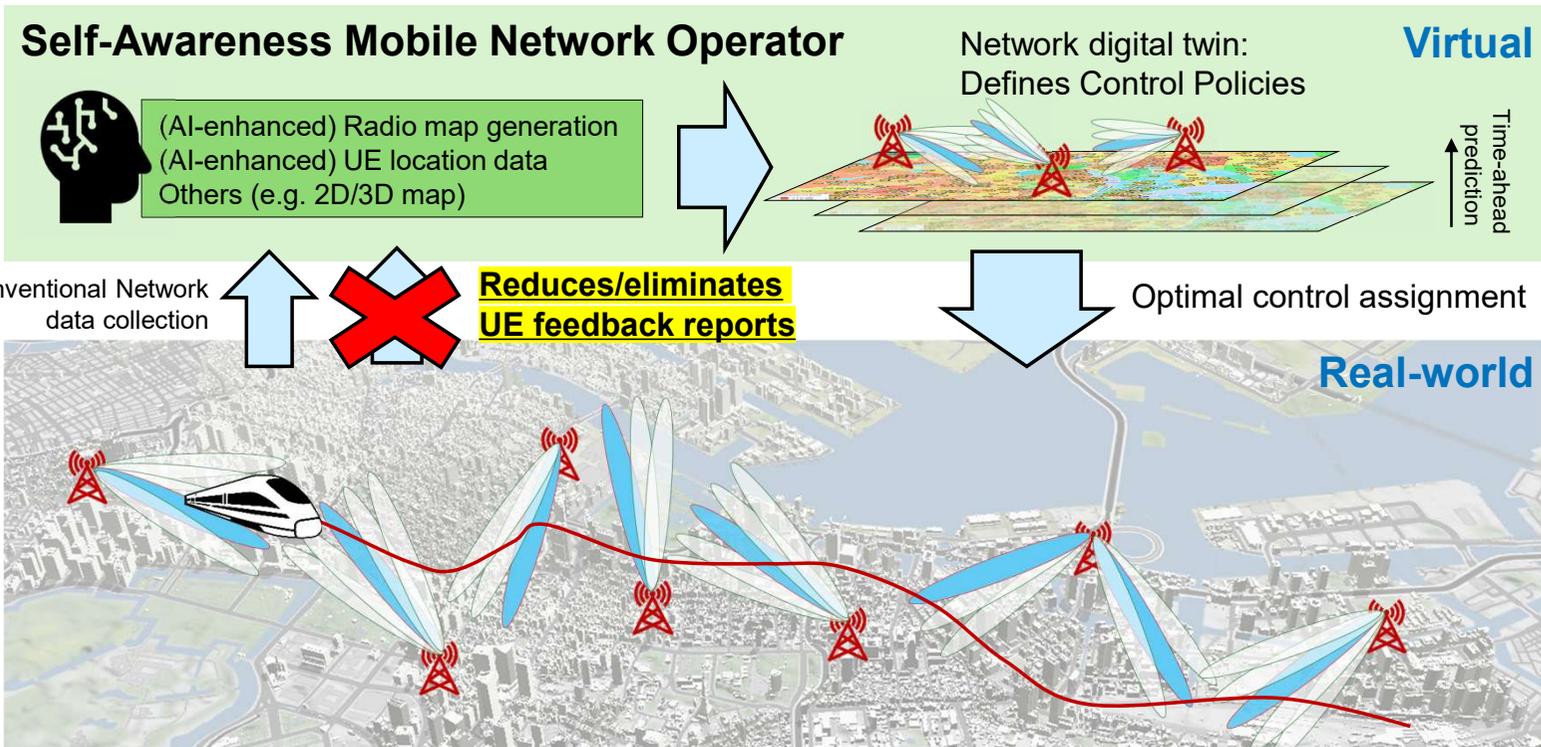
# Self-Awareness Network

- **We propose "Self-awareness network"**: Leverage **AI and digital twin** technologies to improve network performance and efficiency
- With **VI-AVI solutions**, we have successfully completed a joint study demonstrating AI-driven RAN control for 6G
- The results are showcased at **VI-AVI solution's stand 5B18**



# Self-Awareness Network

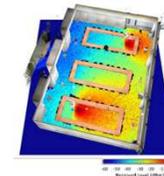
- Leverages **operator-owned data**, such as location and radio maps, to improve network performance
- Overview: Uses AI/ML to process **location data and signal measurements in a virtual environment** and apply real-time control in the real world
- Expected gain: **Reduces traditional control overhead** and improves spectrum efficiency



## Operator-Owned Data



UE location data



Radio propagation maps

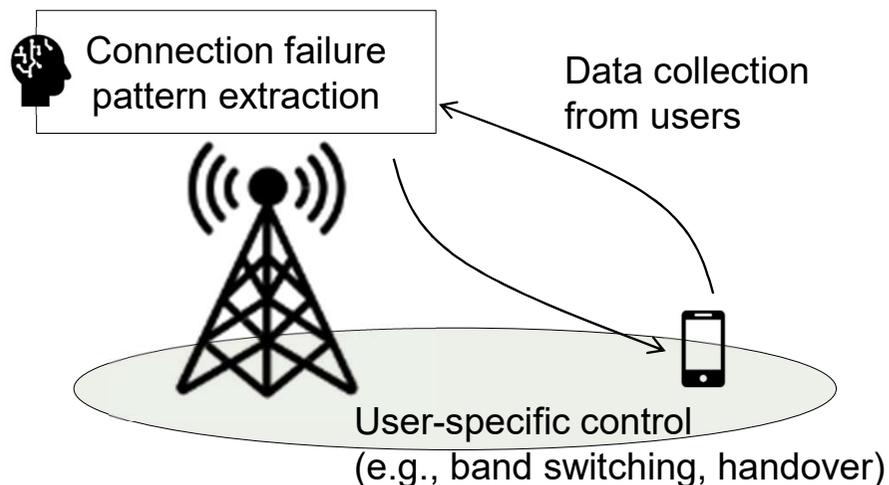
## Why DOCOMO?

- Full Data Access
- Expert Insight

**Use Case: Pre-configuration of Beam Selection**

# Data Utilization for 6G Network Control

- Through our MOU with **Samsung Research**, we leverage historical user perception data—such as throughput, latency, and signal strength—to predict connection failures and enable user-specific control and optimization
- We are advancing standardization through enhanced data collection frameworks, AI/ML operation, and network control/optimization



AI/ML framework for subscriber-level optimization

[Samsung Electronics and NTT DOCOMO Collaborate on AI Research in Mobile Communications](#)  
(1st Oct. 2024)



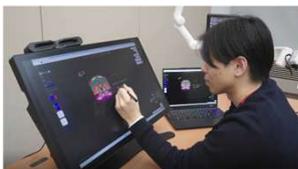
# Expected Network for AI features in 6G



Sensor-less Robots



Autonomous Symbiotic Robot



Human-AI Interaction in AGI/ASI Era

## Data Collection

- ✓ Data collection including Sensing
- ✓ Collaboration among devices and/or apps

## Ultra-Fast High-Volume Data Processing

- ✓ AI related Traffic Handling
- ✓ Non-public NW and traffic priority/access control solutions

## Ultra-Low Latency AI Learning Architecture

- ✓ QoS Control for AI related traffic, NW Slicing, HRLLC
- ✓ In-NW Computing, Deterministic Communications, IOWN

## Ubiquitous connectivity

- ✓ NTN architecture for wide-area large-scale data area.
- ✓ On-demand coverage extension

## Sustainability / Low-Power Consumption

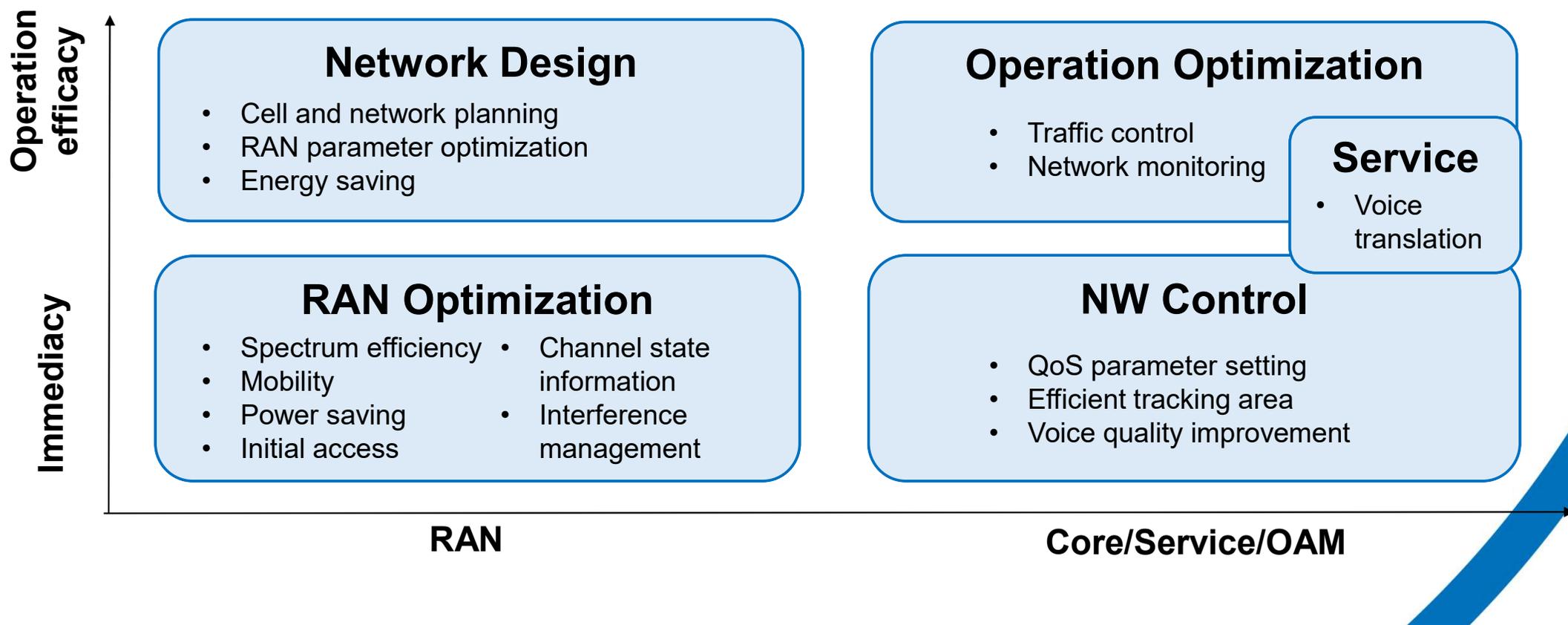
- ✓ Autonomous Distributed Control with AI Agent, Energy Saving
- ✓ Power-saving controls, Ambient IoT, wireless power transfer

## Future devices, UI/UX

- ✓ Collaboration with LLMs & future devices
- ✓ Intuitive user interface (XR, Intent-based)

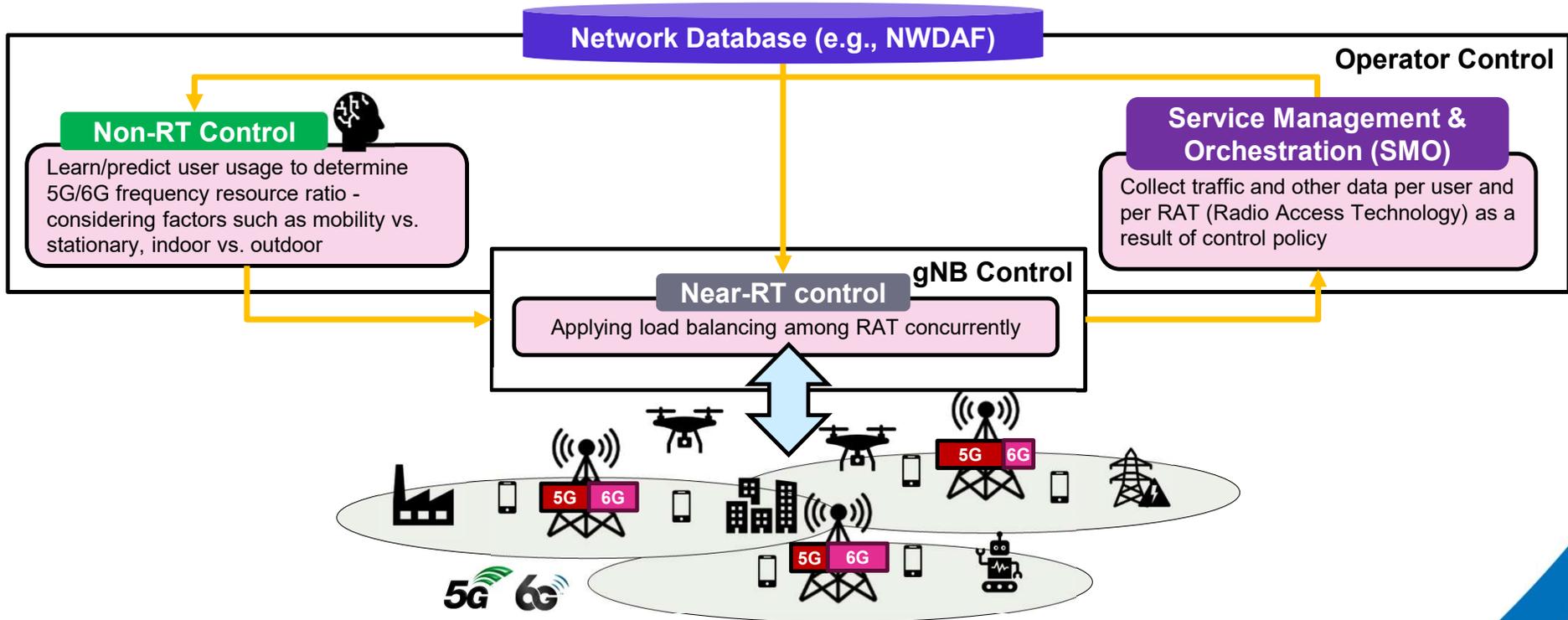
# Target of AI for Network

- Identify where **AI/data can deliver significant impact** across RAN, CN, and OAM (especially for network operators)



# AI Driven Multi-RAT Spectrum Sharing

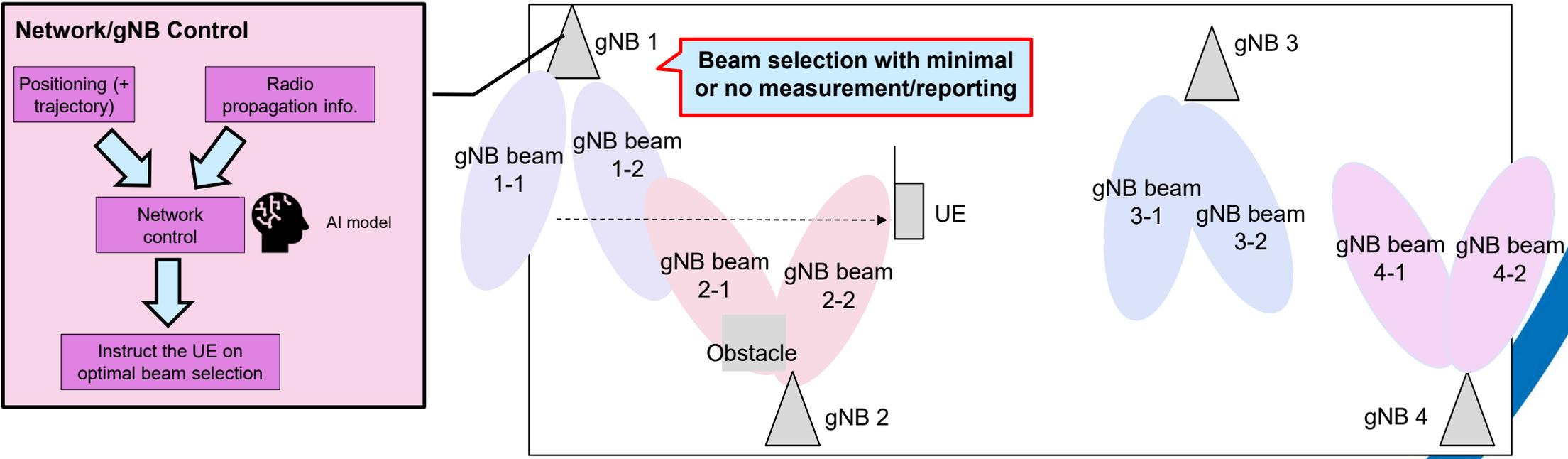
- AI-driven MRSS (Multi-RAT Spectrum Sharing) may unlock further efficient spectrum sharing across 5G and 6G using O-RAN and RIC
- It delivers better UX, lower cost, higher energy efficiency, and a practical migration to 6G



# Self-Awareness Network for 6G : Beam Selection



- By enabling self-awareness network control, AI-driven analog beam selection reduces measurement overhead and delivers significant performance gains



Simulated Demo Environment