AI-Driven Autonomous Network Operation for Mobile Network
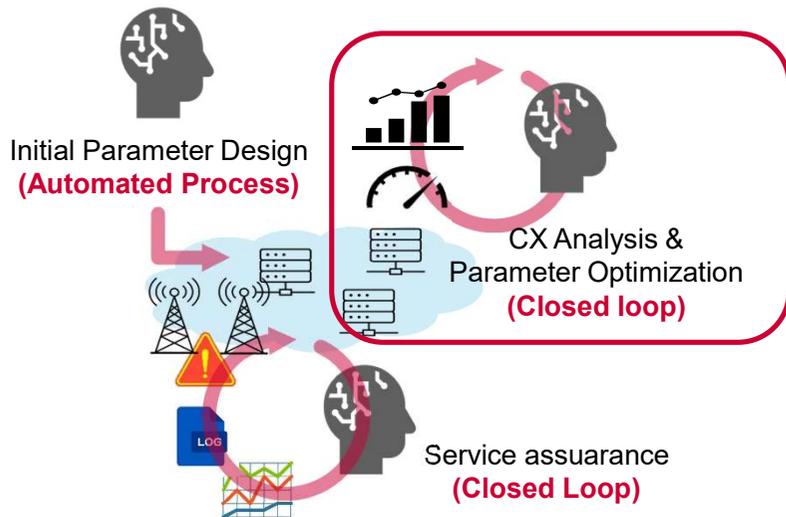# **CNX Index**

MWC26

docomo NTT

DOCOMO's AI-Centric Network Initiatives
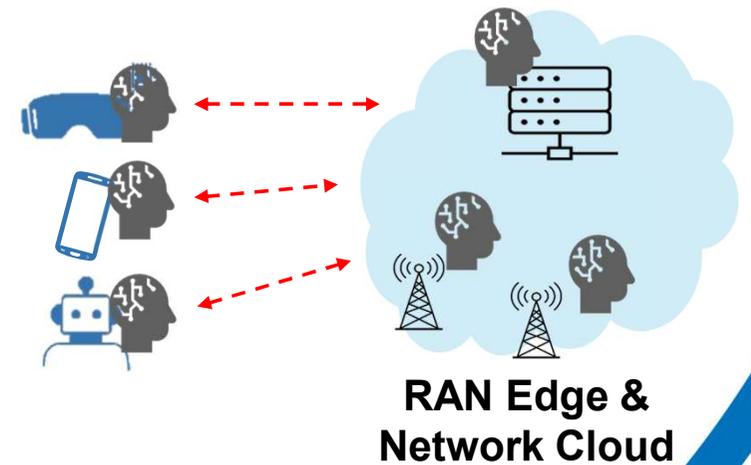
AI for Network

- Autonomous Networks
  - AI-driven network deployment
  - Agentic AI service assurance
  - CX-based network optimization
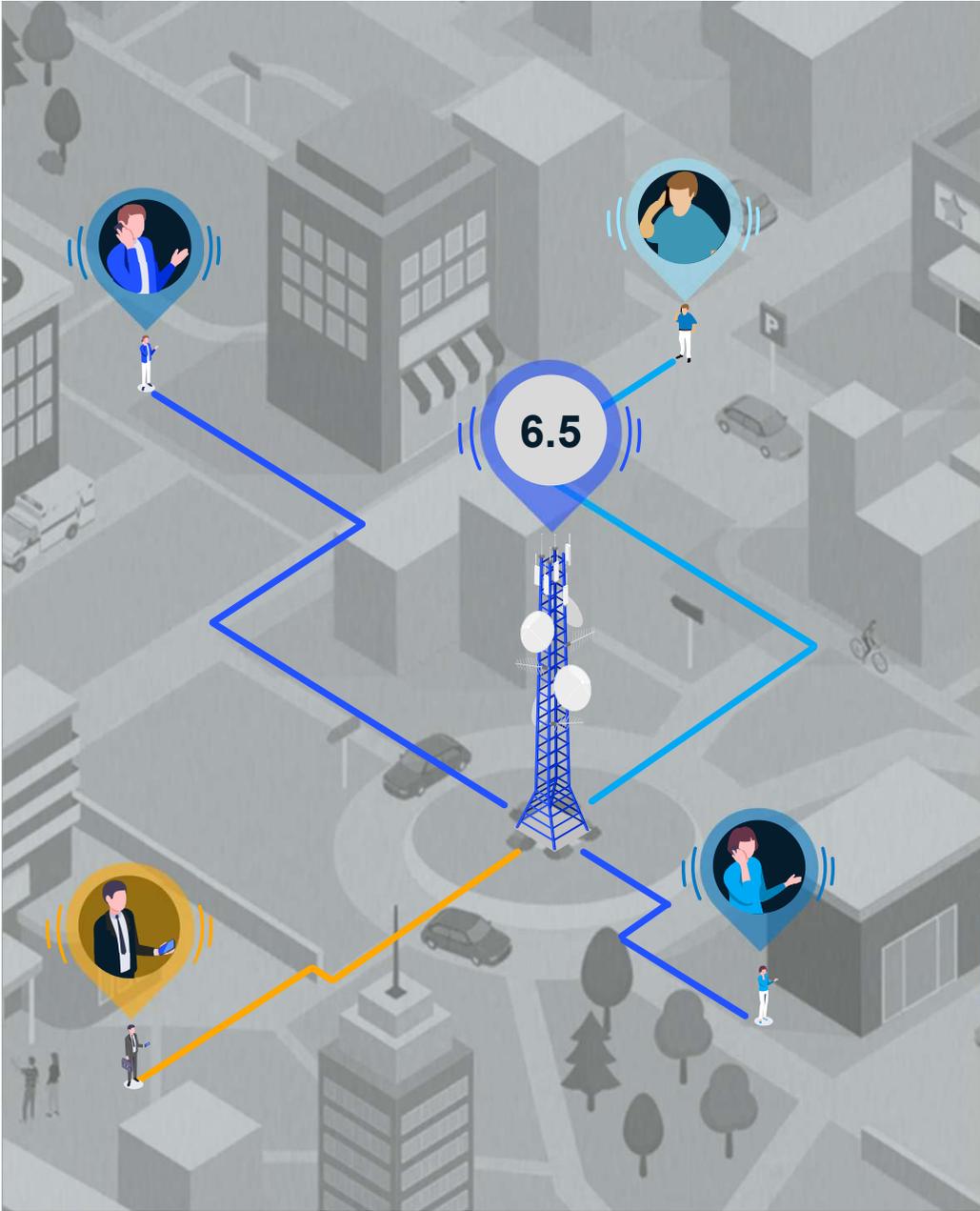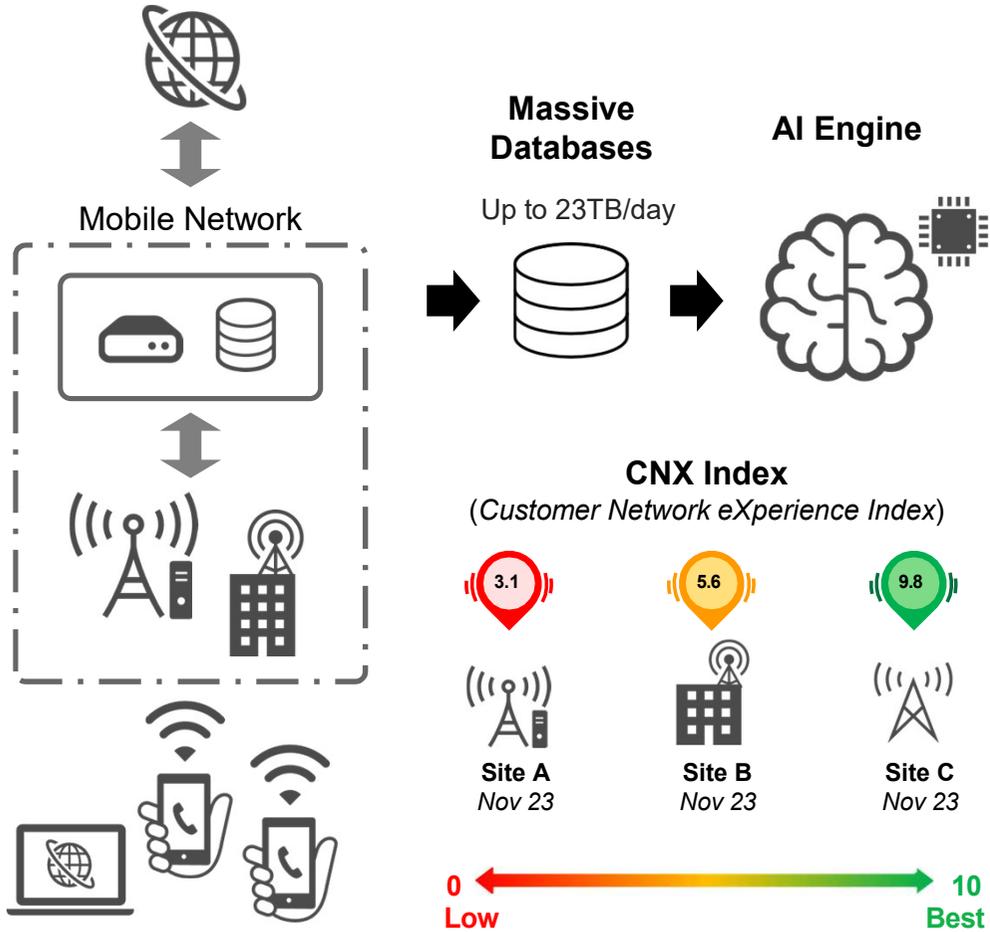- Self-aware networks

Network for AI

- In-Network Computing
- New AI services on mobile (e.g. robots, smart glasses)
- Handling increased AI traffic

Initial Parameter Design
(Automated Process)

CX Analysis &
Parameter Optimization
(Closed loop)

Service assuarance
(Closed Loop)

5G/6G Core Network

5G/6G Radio

AI-based services

**RAN Edge &
Network Cloud**

Automated Site Evaluation: Powered by AI-Driven Big Data

Mobile Network

Massive Databases

Up to 23TB/day

AI Engine

CNX Index
(*Customer Network eXperience Index*)

3.1

5.6

9.8

Site A
Nov 23

Site B
Nov 23

Site C
Nov 23

0
Low

10
Best

6.5

AI-Supported Decision-Making for All Base Stations Across Japan

Why does Japan have one of the most demanding network environment in the world?

High Quality Standards:

Accustomed to high infrastructure standards, Japan's consumers demand zero lag and consistently seek early adoption of innovative technology.
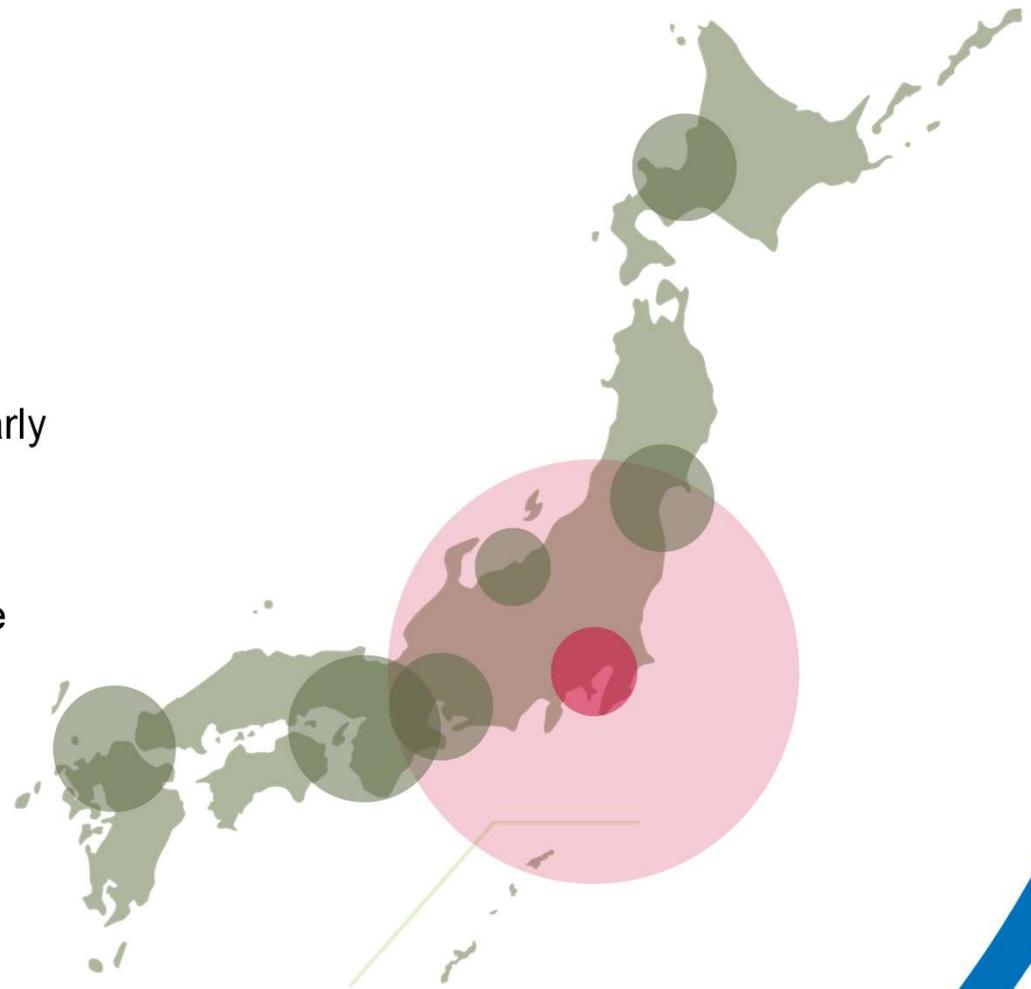
Extreme Site Density:

With up to 150 base stations per km², Japan faces the challenge of managing sophisticated tuning requirements in hyper-dense grids.
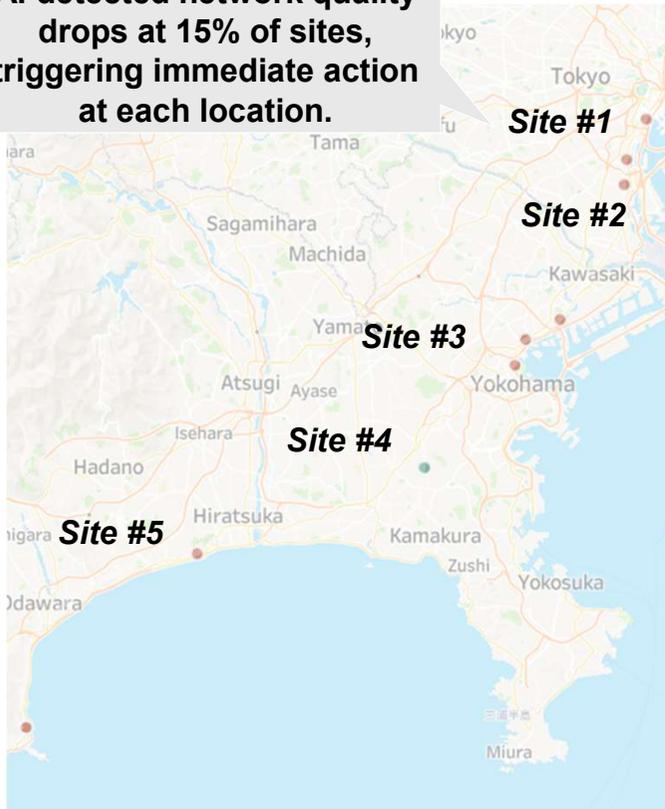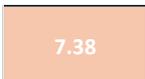
Dual Complexity: Urban vs. Rural

Japan has built a network that bridges the gap between ultra-dense, skyscraper-filled urban environments and rugged mountainous terrain.

Smart Site Evaluation & Action: Train Line Case Study

AI detected network quality drops at 15% of sites, triggering immediate action at each location.

Site #1
Site #2
Site #3
Site #4
Site #5

Site IDs/ NB Name	Avg. CNX Index	5G	Key Decile Drivers	Potential Interventions
Site #1		NA	Heavy congestion	Add 5G capacity (C-Band)
Site #2		NA	Frequent connection drops (handover)	Optimize handover settings
Site #3		sub6	Weak signal inside tunnels	Adjust antenna power / tilt
Site #4		sub6	Frequent connection drops (SCG Failure)	Optimize SCG accessibility
Site #5		NA	**Low VoLTE performance** (R-factor <90)	Confirm coverage and plan set up a new site
…				
Site #N	7.38	-	**High C-Band** utilization; **low 4G congestion**	NA

Driving Business Impact with CNX Index

Use Cases for CNX Index

1. **Faster Root Cause Analysis**
AI instantly identifies issues, ranging from capacity constraints to interference.

2. **Smart CAPEX Allocation**
Prioritize investments to maximize return on investment (ROI).

3. **Proactive User Experience**
Leveraging daily, site-level insights to deliver precise and proactive engineering measures for every customer.

Our Goal:
To achieve ROI-driven CAPEX optimization and deliver a differentiated customer experience through nationwide AI-supported decision-making.

Looking Ahead:
Key Areas for Further Exploration

Expanding Use Cases
Integrating CNX into diverse business operations, advancing multi-faceted customer experience enhancements.

Continuous Network Adaptation
Constantly evolving alongside the changing environment by perpetually strengthening our AI models.