NTT's Growth Strategy from the perspective of CTO

This document is a translation of the Japanese original. The Japanese original is authoritative.

The forward-looking statements and projected figures concerning the future performance of NTT and its subsidiaries and affiliates contained or referred to herein are based on a series of assumptions, projections, estimates, judgments and beliefs of the management of NTT in light of information currently available to it regarding NTT and its subsidiaries and affiliates, the economy and telecommunications industry in Japan and overseas, and other factors. These projections and estimates may be affected by the future business operations of NTT and its subsidiaries and affiliates, the state of the economy in Japan and abroad, possible fluctuations in the securities markets, the pricing of services, the effects of competition, the performance of new products, services and new businesses, changes to laws and regulations affecting the telecommunications industry in Japan and elsewhere, other changes in circumstances that could cause actual results to differ materially from the forecasts contained or referred to herein, as well as other risks included in NTT's most recent Annual Securities Report and in any other materials publicly disclosed by NTT on its website.

* "E" in this material represents that the figure is a plan or projection for operation.

** "FY" in this material indicates the fiscal year ending March 31 of the succeeding year.

*** "1Q" in this material represents the three-month period beginning on April 1 and ending on June 30, "2Q" represents the six-month period beginning on April 1 and ending on September 30, "3Q" represents the nine-month period beginning on April 1 and ending on December 31, and "4Q" represents the twelve-month period beginning on April 1 and ending on March 31.

Toward NTT's medium-term growth and development

Desired direction

(1)
Development and provision of new services based on a "remote world"

(2)
Concentration of resources and promotion of digital transformation

(3)
Worldwide promotion of research and development

(4)
Strengthening of new business activities, such as smart-life operations

Contribution to society through business initiatives

Global competitiveness	Social challenges
Safety and security	Customer satisfaction

Strengthening global industrial competitiveness

- ✓ Develop and promote information and telecommunication devices, software, and services that can be used worldwide
- ✓ Contribute to global information and telecommunication standards
- ✓ Further advance information and telecommunication technology in new fields such as outer space and underwater

Solving social challenges

- ✓ Spread and promote digitization and smartification
- ✓ Revitalize local communities and economies

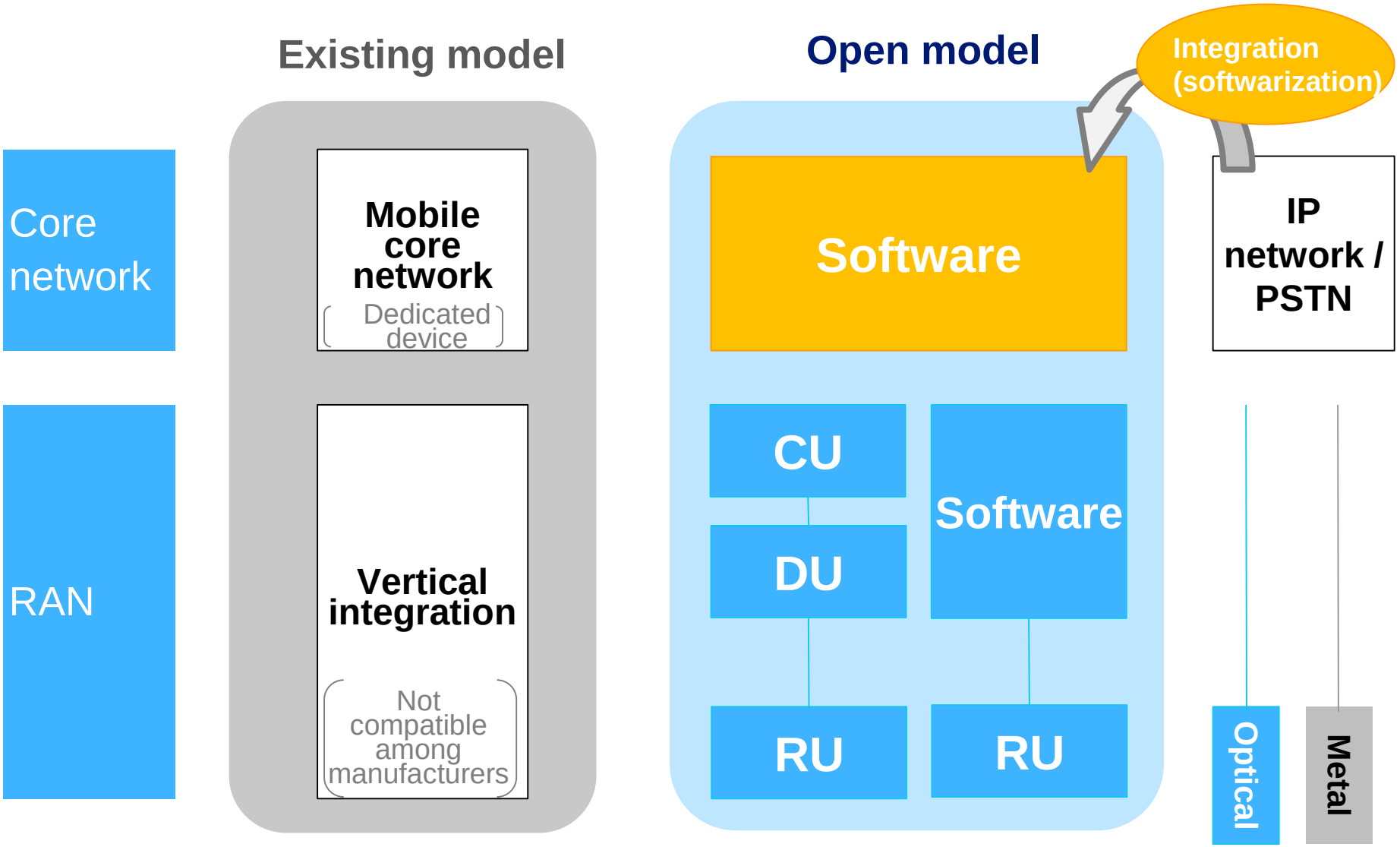
Realizing safe and secure telecommunication infrastructure

- ✓ Improve business continuity, increase the resilience of information and telecommunication systems against disasters, and strengthen cybersecurity

Further developing the information and telecommunication industry and realizing services that satisfy customers

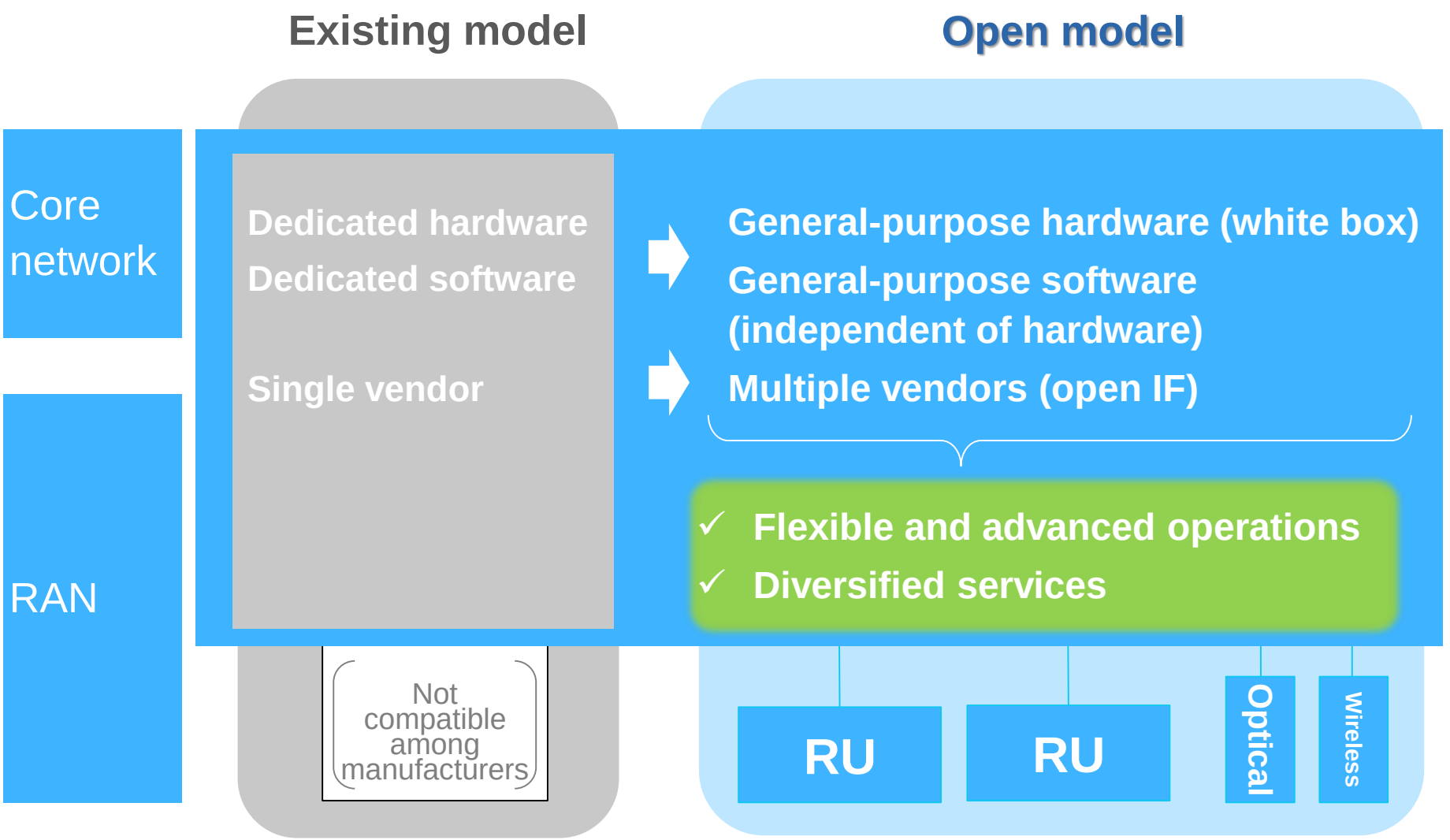
- ✓ Provide services that are easier to use and lower in price

(1) Development and provision of new services based on a “remote world”



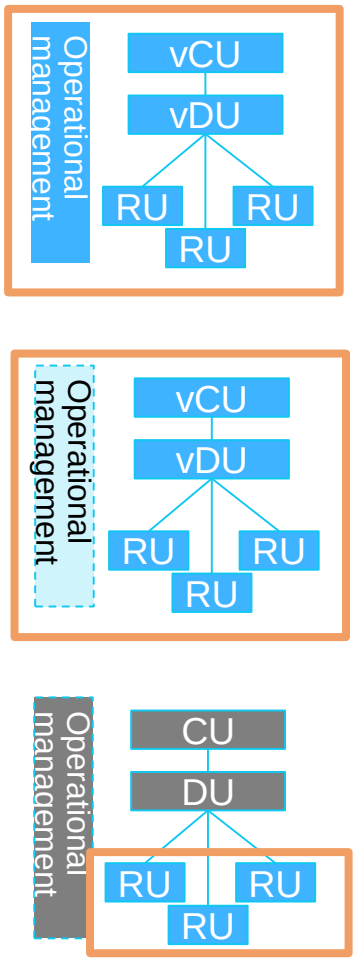
RU: Radio Unit DU: Distributed Unit CU: Central Unit

(1) Development and provision of new services based on a “remote world”



Open access networks (O-RAN plus vRAN)

Global competitiveness	Social challenges
Safety and security	Customer satisfaction



Flexible and advanced operations

High availability
Scalability
Resilience

Virtualization
vRAN

Open networks
O-RAN

NEC

- Software technology
- Production technology

NTT

- Verification for practical use
"OSS/BSS advancement"
- LSI development

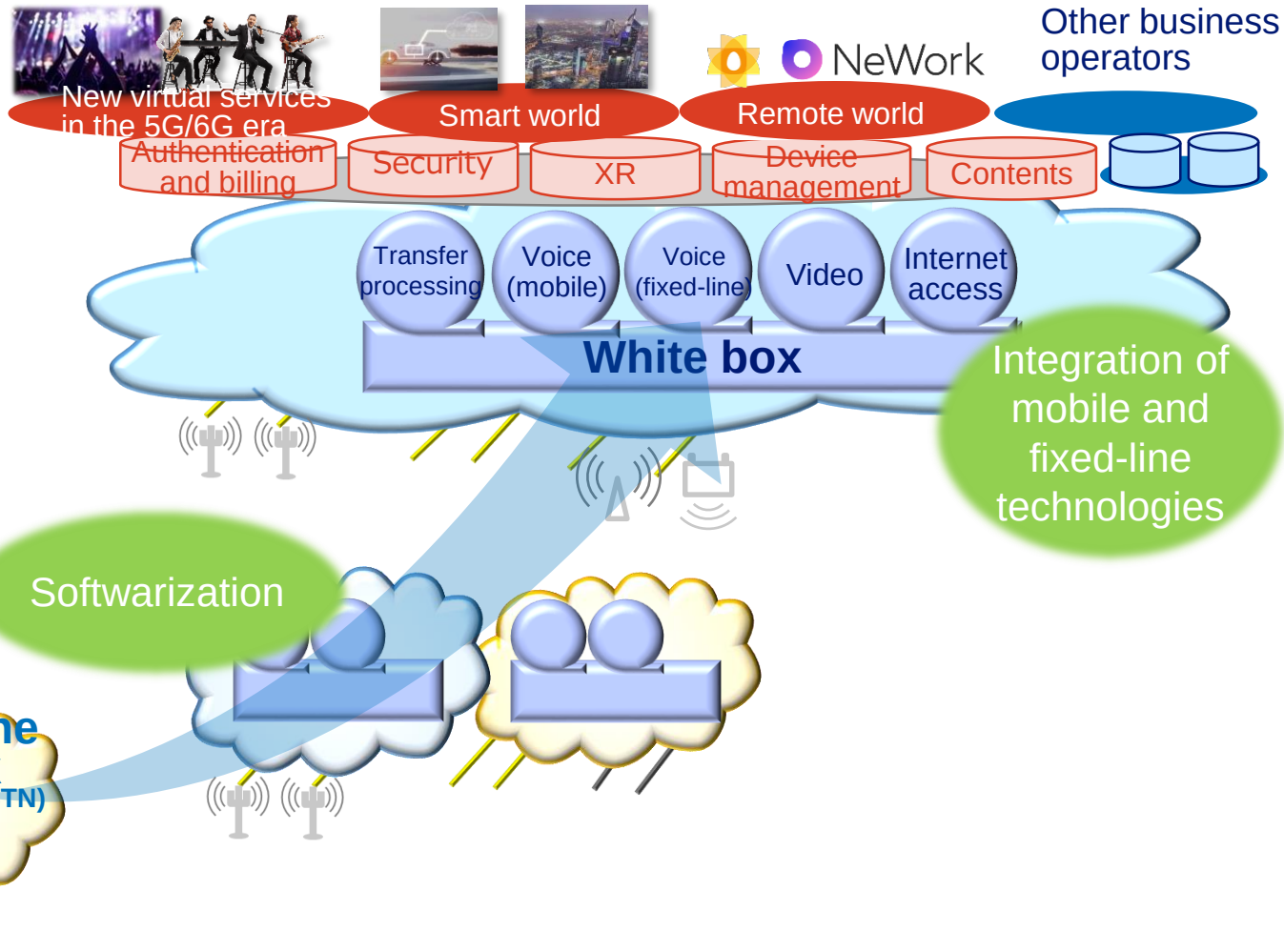
Cooperation

Partnership

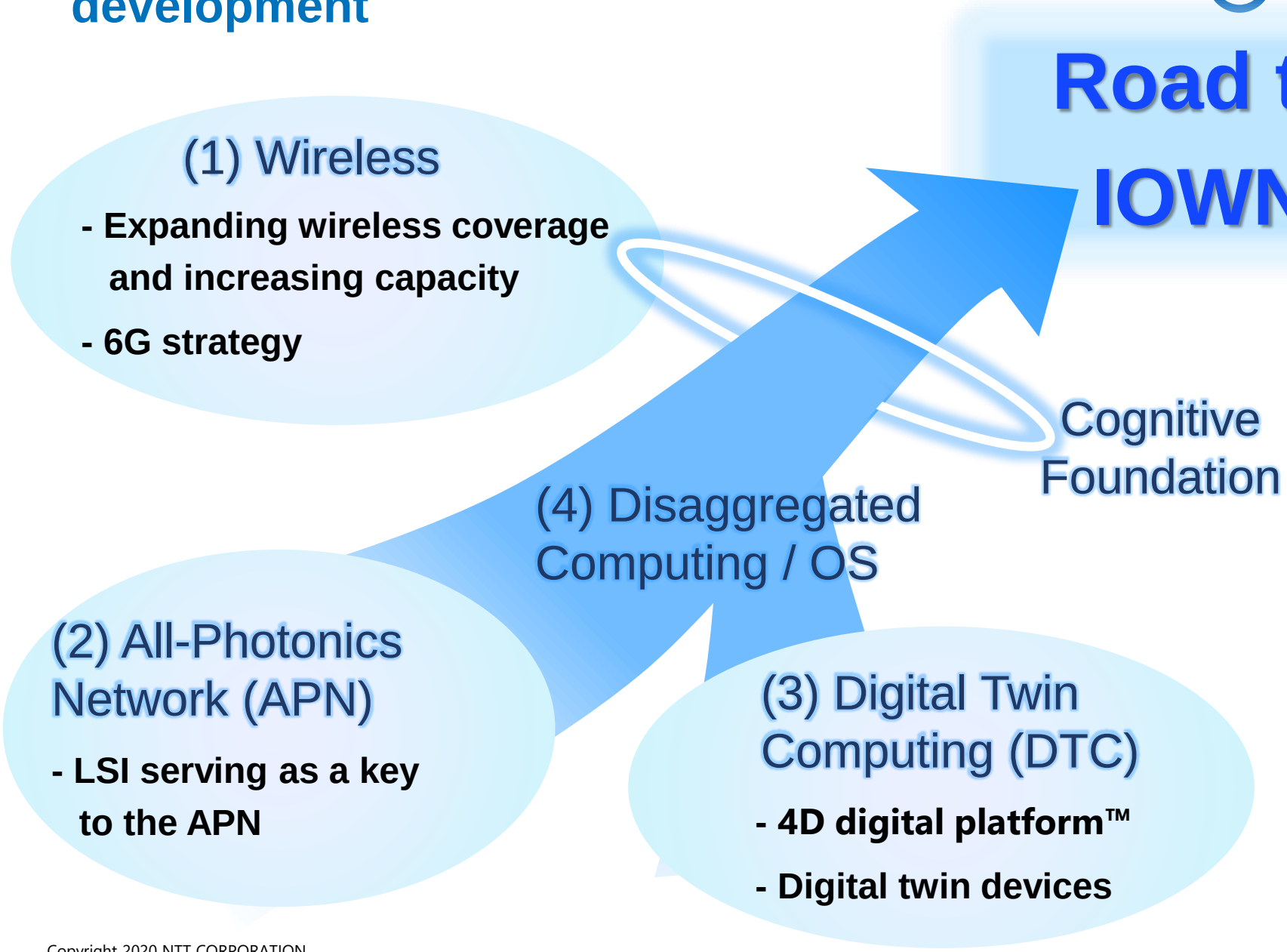
- Reaching a wide range of customers
- Providing proposal, installation support, and maintenance and operation services

Integration of mobile and fixed-line technologies for core networks (new foundations of services)

Global competitiveness	Social challenges
Safety and security	Customer satisfaction



(3) Worldwide promotion of research and development



(1) Wireless
Expanding wireless coverage and increasing capacity

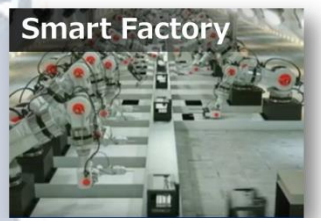
NTT

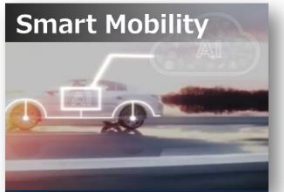
Global competitiveness	Social challenges
Safety and security	Customer satisfaction

Optical wireless communication in space

Expansion

Land





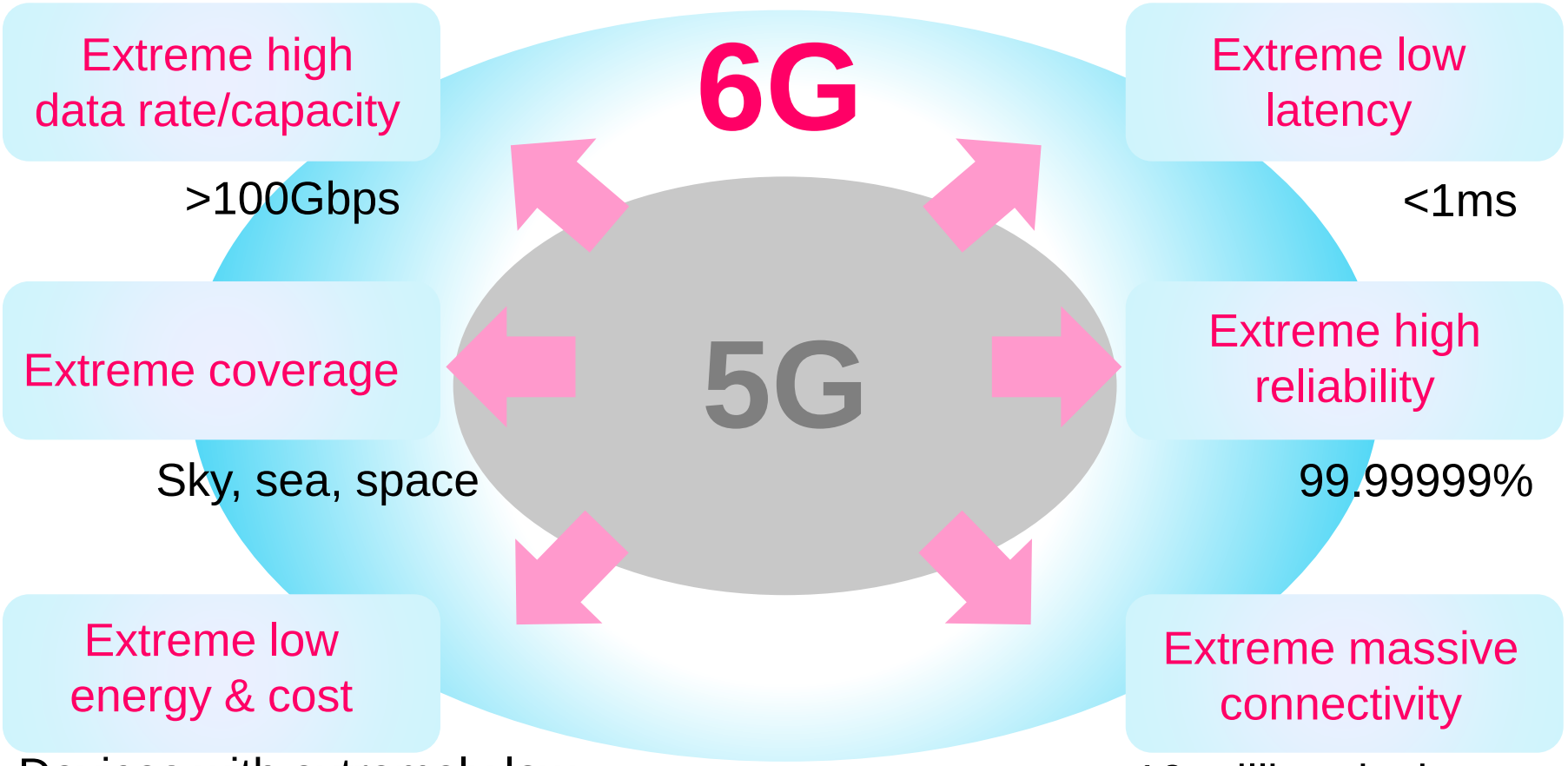
Expansion

Sea

Ultrasonic communication under sea

(1) Wireless 6G strategy

Global competitiveness	Social challenges
Safety and security	Customer satisfaction



(2) All-Photonics Network (APN)

Low latency,
high bandwidth

NTT

Global competitiveness	Social challenges
Safety and security	Customer satisfaction

Spread and promotion of digitization and smartification

Revitalization of local communities and economies

Smart City

Smart Mobility

Smart Sports

Smart Factory

Smart Agri

Smart Healthcare

Wavelength 1

Wavelength 2

Wavelength 3

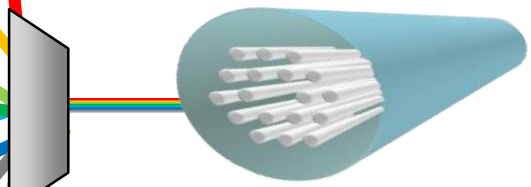
Wavelength 4

Wavelength 5

Wavelength 6

Wavelength 7

Wavelength n



IP network

PSTN

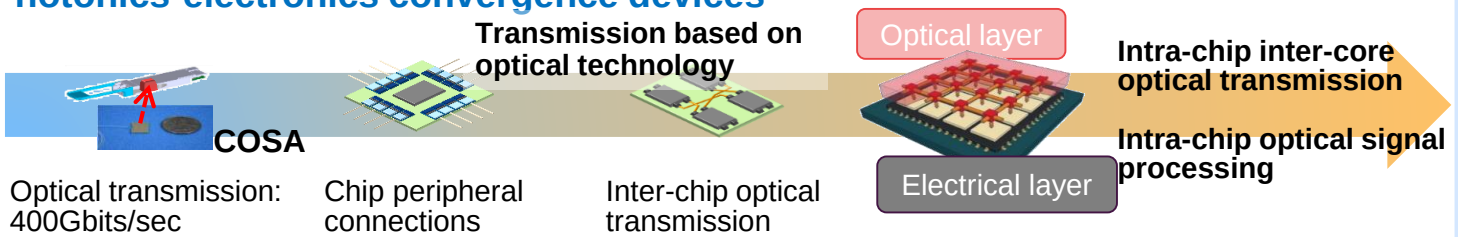
Multi-connectivity,
low bandwidth

(2) Self-manufacture of LSIs that serve as a key to the APN

NTT

Global competitiveness	Social challenges
Safety and security	Customer satisfaction

Photonics-electronics convergence devices



Expansion of information-processing capacity

Limitation or reduction of power consumption

(1) Low power consumption

Power efficiency **100 times higher**[1]

- Transmission systems
  Light (wavelengths) throughout
- Information processing platform
  Photonics-electronics convergence devices

Response to increasing data traffic

(2) High quality, large capacity

Transmission capacity **125 times higher**[2]

- Assignment of a wavelength to each service
- Not dependent on IP addressing

Low-latency transmission platform

(3) Low latency

End-to-end delay **1/200**[3]

- No data compression
- No queueing

1. Target power efficiency for the photonics part
2. Target communication capacity per fiber
3. Target delay for uncompressed video traffic within the same prefecture in Japan

(3) Digital Twin Computing

NTT

Global competitiveness | Social challenges
Safety and security | Customer satisfaction

Scale of digital twins

Deeper — person — group — town — city — nation — globe — space — Broader

Capability expansion
Strengthening of intellectual operations and skills and collaboration with digital twin computing (which can achieve self-sustaining growth)

Smartification of infrastructure and industry
Digital transformation (smart infrastructure, smart factory, smart agriculture, etc.)

Optimal control of people flow and traffic flow
Control of people flow, traffic flow, etc. through the use of 4D information for time and space

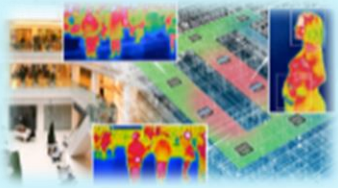
Future city design
New urban development based on people's social activities and medium- and long-term forecasts of variations of 4D information

4D digital platform™

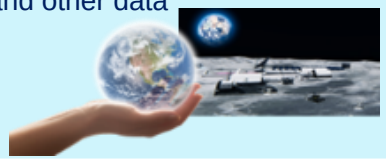
Decision-making support
Use of various future visions and possibilities for decision-making

Medical care and health
Individualized and forecast-based medical care and behavior modification through biological sensing and lifestyle analysis

Energy forecast for cities
Real-time demand forecast for energy infrastructure (electricity, gas, water, etc.) and efficient energy use



Global-scale digital replication
Forecasting of large-scale natural disasters and creation of countermeasures by digitizing the geographical features of the earth's surface, climate change, and other data



Use of digital twin devices

(3) DTC 4D digital platform™

Global competitiveness	Social challenges
Safety and security	Customer satisfaction

4D digital platform™

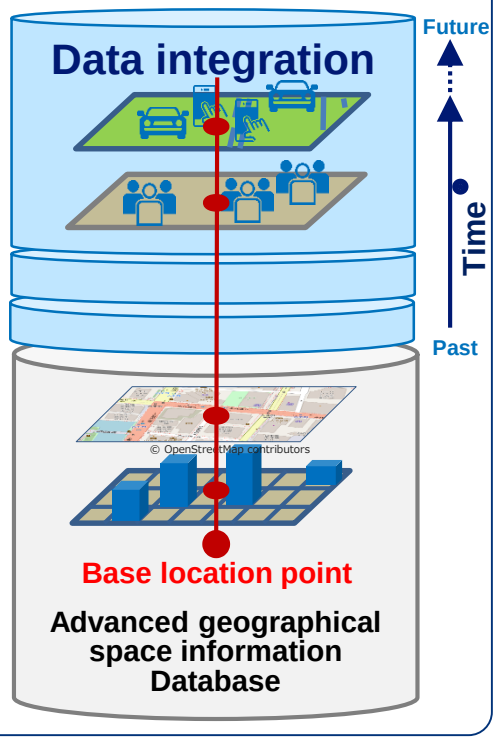
Sensing data
- Mobile object sensor
- Environment sensor

High-precision 3D space information
- Mobile Mapping System Aerial photo

Existing map data
- Semantic information (road, house, etc.)

Wide variety of data
(Connection with different types of data sources)

Integration of sensing data on a real-time basis based on highly accurate location and time information



- **Smartification of infrastructure and industry**
- **Optimal control of people flow and traffic flow**
- **Future city design**
- **High-precision location navigation**

(3) DTC Digital twin device (in the case of medical ICT)

Global competitiveness	Social challenges
Safety and security	Customer satisfaction

Core body temperature sensor

Blood sensor

Wearable electrocardiogram

Vital data device

Constant monitoring

Quick abnormality detection and treatment (real-time medical care)

AI tethoscope

Remote palpation and auscultation

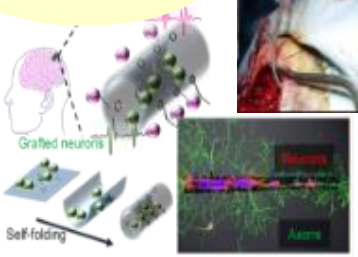
In-situ treatment through the use of in-the-body devices

Medical ICT platform

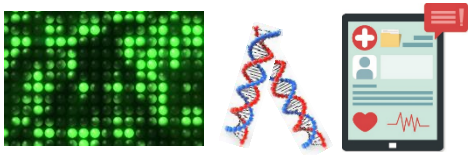
Remote medical care

Remote AI diagnosis
Remote healthcare service

Implant



Medical treatment optimized for individual patients



Telesurgery

(4) Disaggregated Computing / OS development

Global competitiveness | Social challenges

Safety and security | Customer satisfaction


Smart Mobility


Smart City

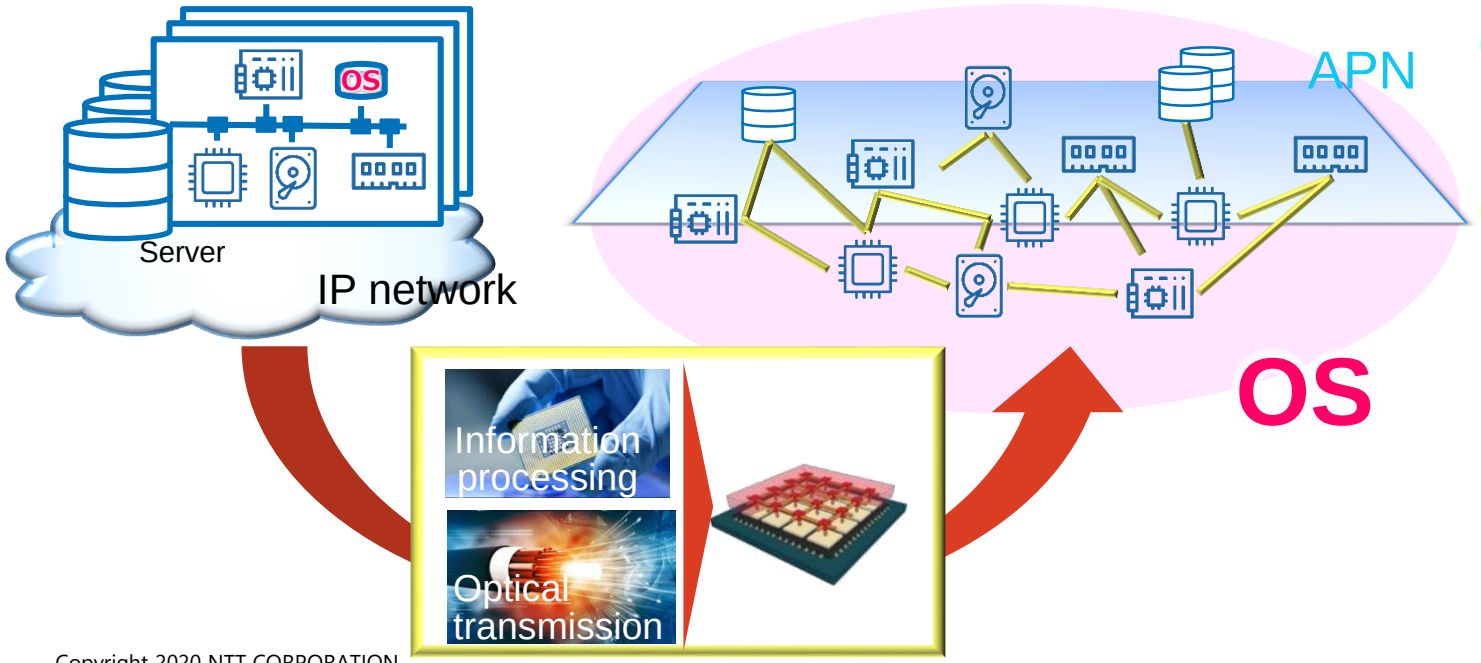

Smart Sports


Smart Factory


Smart Agri


Smart Healthcare

Driving digital society



High-speed data transfer based on optical connection

High-speed processing through the use of processors based on integration of photonics and electronics

Optimal integration of data transfer and processing based on OS

NTT R&D Forum 2020 Connect

Into the IOWN — Change the Future

2020 11/17 - 11/20 ONLINE

This year, NTT R&D Forum 2020 Connect will be held online, based on the concept "Into the IOWN – Change the Future". Join us as we take a step in a new direction!

4 / 80 / 8

DAYS / EXHIBITIONS / LIVE STREAMINGS

Admission Price Free

Advance registration will begin in early October.

Your Value Partner