CTO Message

Going beyond "testing" with leading-edge technology

Hanako Noda

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Research Laboratory
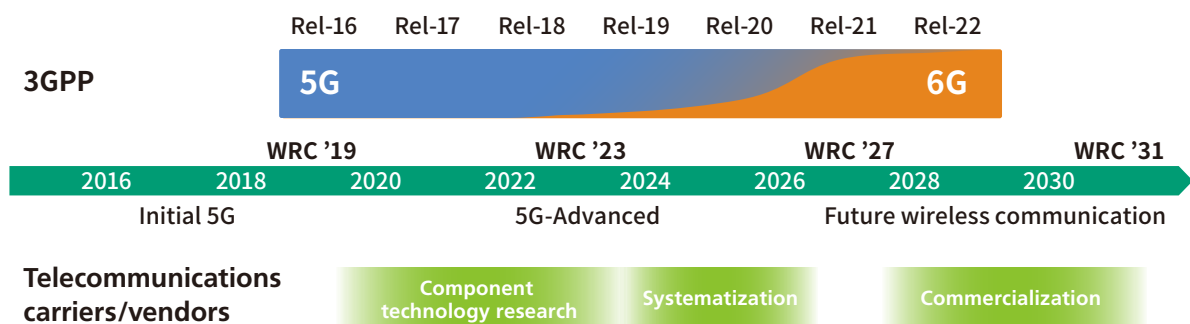
Expectations for 6G

Relevant parties have been discussing 6G since 2018 and companies at the vanguard are already pushing forward research on the fundamental technologies of 6G. 6G aims to take the role not only as the base of telecommunications but as the foundation of the social system, by enhancing 5G and targeting tenfold performance of its three pillars: high-speed/high-capacity, massive simultaneous connection and ultra-low latency.

In addition there are new features aimed for 6G such as; (1) the "extreme coverage extension" that expands the radio connectivity into the sky, sea, and space, (2) the "ultra-low power consumption" that significantly reduces the electric power consumption for which demand is expected to increase due to ever-increasing data volume,

(3) the "ultra-high reliability" that ensures the quality of services in various use cases as well as security and privacy protection,
(4) the "autonomy" where equipment are autonomously interacting therefore the networks are optimized according to the needs.

While 5G worked for technological innovation between wired and wireless communications networks, 6G widens the applicable scope and comes to include on-network processing and control functions of information from terminals and sensors, with goals of delivering the end-to-end performance. For example, reducing latency is one of these goals. With such application, sensors and cameras act like our eyes within factories, and acquired data through them are processed in the computer over the network. In order to send responses to factory equipment, it is impera-

▊ **Illustration of Transitioning from 5G to 6G Following 3GPP Standards**

	Rel-16	Rel-17	Rel-18	Rel-19	Rel-20	Rel-21	Rel-22
3GPP	5G						6G

	WRC '19		WRC '23		WRC '27		WRC '31
2016	2018	2020	2022	2024	2026	2028	2030
Initial 5G			5G-Advanced		Future wireless communication		

Telecommunications carriers/vendors	Component technology research	Systematization	Commercialization

WRC: World Radiocommunication Conference
*Source: created by Anritsu using publicly available information

In order for Anritsu to be a company that continues to support society 10 to 20 years and beyond in the future, we believe that it is necessary to drive the advancement of "testing" technology and expansion of applicable fields, while also expanding into further fields beyond "testing". The first step in that journey was establishing the Advanced Research Laboratory in 2020, then commencing research activities at that facility. The Laboratory conducts research into 6G technology expected to be commercialized around 2028. At the same time, the Laboratory also carries out basic research looking further into the future as we strive to address challenges for making NEMS technology viable. Through these activities, we are providing technological support for the future of Anritsu's business, while working on test and measurement, ensuring safety and security of food and pharmaceutical products, as well as acquisition of sensing technology that is expected to deliver value beyond our current focus on "testing."

The aim of the Forum includes the realization of new communication platforms through innovative approaches based around optical technology. Therefore, the aim of both IOWN Global Forum and 6G towards the future are well aligned. To that extent, Anritsu has recognized the necessity to carefully watch the situation of both and decided to participate in IOWN Global Forum since 2020.

*IOWN Global Forum: The Innovative Optical and Wireless Network Global Forum, established in 2019
The Forum covers three core technologies: full photonic networks (which adopt photonics-based technologies for all areas reaching networks and devices), what is called "cognitive foundation" (a concept for using information and AI to predict the future and build autonomously optimized networks), and digital twin computing (which uses computers and AI technology to take the information of our physical world and perform computations on it in a virtual (cyber) environment in order to predict the future, provide feedback to the physical world, and intimately connect the two domains).
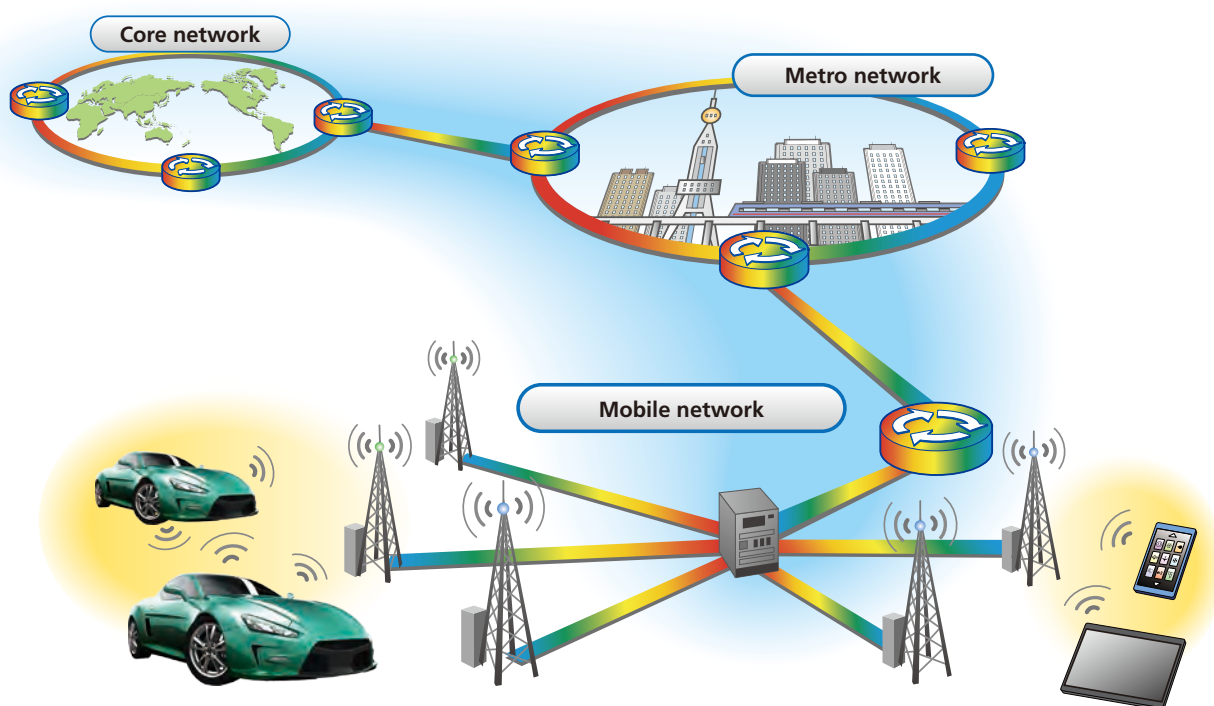
Leading-Edge Technology Research Initiatives for 6G

At the Advanced Research Laboratory, we are engaging in R&D on two measurement technologies needed for 6G.

(1) R&D on 300GHz Band Wireless Signal Wideband/High-Sensitivity Measuring Technology

Anritsu's 6G initiative was prompted by the Ministry of Internal Affairs and Communications' research and development for expansion of radio wave resources in 2014 the "300GHz band wireless signal wideband/high-sensitivity measuring technology."

tive to minimize overall latency of the communication cycle from data acquisition to sending instructions to equipment. 6G aims to complete the role that 5G originally aimed for, that is to become the social infrastructure.

At the same time, the IOWN Global Forum* has been established with the objective of sophisticating optical technology-based social infrastructure.

■ **Illustration of a Full-Photonic Network**

CTO Message

When the research first began, there were not yet ideas of frequencies being used for 6G, but in the four years during which research progressed, the possibility gradually increased that frequencies above 100GHz would be used.

Terahertz waves (generally 100GHz–3THz) fall in the frequency band between radio waves and visible light and had not conventionally been used. However, with the current progress in radio wave and light wave device technologies, as well as the fusion of those technologies, expectations are rising for the use of this frequency band. In 2020, our Laboratory started on core component R&D necessary for developing new measuring instruments for the 300GHz band.

Even with the 28GHz band that is being newly adopted for 5G, it was said that the signals could not reach far distances, so the level of difficulty rises even further when trying to communicate at 300GHz. Many similar challenges accompany the development of measuring instruments, which the Laboratory is striving to tackle.

(2) R&D to further advance 5G mobile communication systems

Prompted by the Ministry of Internal Affairs and Communications' expansion of radio wave resources in 2019, "R&D to further advance 5G mobile communication systems," Anritsu is working on the establishment of radio interference monitoring techniques relevant to full-duplex communications for highly efficient frequency utilization.

In 4G systems, a method called FDD (Frequency Division Duplex) is used, which employs different carrier frequencies for uplink and downlink signals. When these types of multiple signals with different frequencies were propagated in the air, it had been easy to separate each signal by focusing on their different frequencies. However, 5G adopted TDD (Time Division Duplex) (Figure 1) that shares the same frequencies for uplink and downlink between terminals and a 5G base station. Consequently, it became difficult to separate multiple signals of the same frequency moving between many terminals and one base station. In reality, when the base station is interacting with two or more terminals, it is only possible to send data from the base station or from one terminal at the same time so that the communication per terminal becomes less efficient.

Full-duplex is an approach that was developed as a technological solution to this issue. Basically, full-duplex (Figure 2) allows simultaneous sending and receiving from each base station and terminal so that the efficiency of frequency usage doubles.

Meanwhile, when the base station and terminal are simultaneously sending and receiving, it becomes necessary to ensure that the transmitted signal is isolated so that it does not interfere its own receiver. For FDD using different frequencies for uplink and downlink, you can easily pick up desired signals on the specific target frequency using a relatively small component called a filter. In other words, you can block the unnecessary signals at certain frequencies from its own receiver. However, with the full-duplex method using the same frequencies, the filter solution does not work (signal separation is not possible). Therefore, it is not practical to introduce simultaneous sending and receiving with the terminals as eliminating self-interference requires complex and large sized signal processing that results in higher cost and terminal size becoming larger. In fact, we are progressing our research by implementing signal processing to eliminate self interference only with the base station so that a base station communicates with two terminals with the scheme, when one is receiving the signal, the other sends the signal in order to improve communication efficiency. (Figure 3)
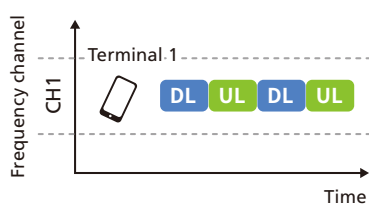
▌ Illustration of the New Communications Method
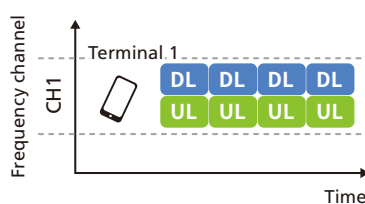

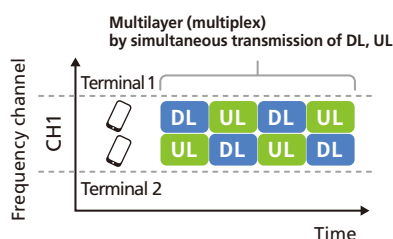Figure 1: Current approach (TDD cellular)
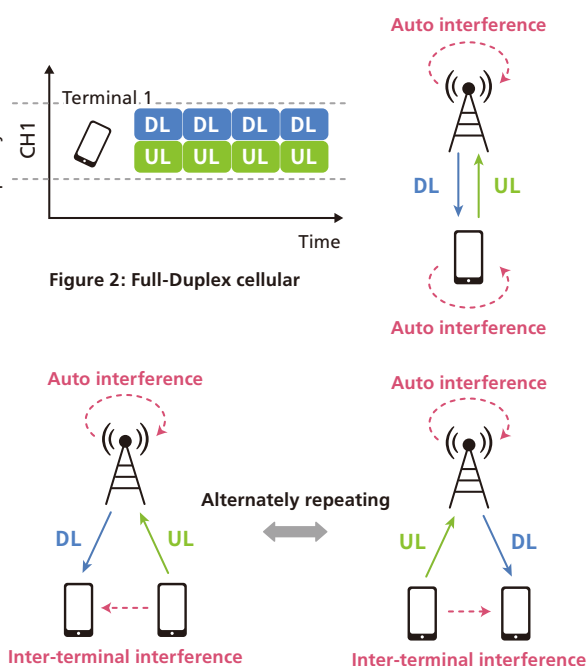
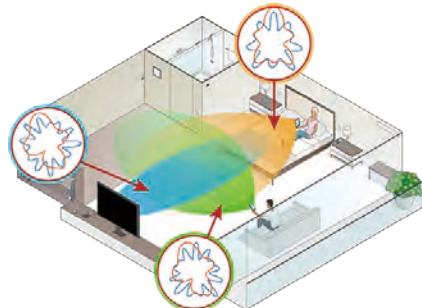Figure 2: Full-Duplex cellular

Figure 3: Objective（Full-Duplex cellular）

▍ Illustration of Radio Frequency Interference Monitoring

Conventional technology	Proposed technology
Only able to measure spatial power distribution	Able to measure, for example, interference between terminals through signal division

With this method, when multiple terminals are within the distance where the signal of one reaches another, the radio wave signal from the base station is mixed with the radio waves from the second terminal so that communication quality may be degraded. It then becomes necessary to know ahead of time the status of signals from the other terminals in order to determine whether the full-duplex approach can be used.

The radio frequency interference monitoring technology that Anritsu is tackling for this research project enables the user to understand the status of signals from each terminal by using AI to separate and visualize signals that arrive on the same frequency. With this technology, even if signals from the base station or multiple terminals are mixed, each can be separated by their transmission sources and the user can identify the direction where the signal comes from and its power.

Open Activities to Go Beyond "testing"

Research at the Advanced Research Laboratory are conducted with highly diverse members. For our NEMS research, we invited an expert in this field from an university and we have opened a new laboratory as well. The team members are individuals with various backgrounds, including those with professional experiences, one who was involved in research overseas, an expert in specialized equipment, a physical measurement specialist, and a micro-fabrication specialist. Also, the 6G research team is comprised of members with specialties in physics, optics, chemistry, signal processing, and various other fields. Team members with this level of diversity can offer input from each of their speciality perspectives, thereby helping make discussions on each research theme more dynamic. Additionally, when pursuing research, an open approach is used in order to quickly reach objectives not insisting on domestic approaches. We first identify target technology areas to

tackle internally and proceed with R&D, while also welcoming in external knowledge through joint projects with university research laboratories and independent research institutions.

We provide a forum for discussions, mainly centering on technology, in order to internally share the knowledge from these research activities. We also receive feedback from business divisions on applications of the technology, and we engage in human resource exchanges. Both optical and microwave technologies are Anritsu's core competencies and we are called upon to foster them and utilize them in business. As part of research programs on microwaves, the Advanced Research Laboratory is working on core components for millimeter waves. This effort has been progressed under close cooperation with our Test & Measurement Company and Sensing & Devices Company.

Additionally, once we enter a 6G world, communications devices are expected to be placed at a density of 1,000 devices per square kilometer, with various types of sensors working with each of these devices. For example, there is a light detection technology called LiDAR that emits laser light and calculates distances based on the time it takes for the light to return after reflecting off objects. LiDAR is expected to have applications for self-driving vehicles that need to recognize pedestrians and other objects. It is also the technology used in the iPhone 12's autofocus feature in dark environments.

To date, Anritsu's optical technology has mainly been used in businesses in the field of optical communications, including test and measurement equipment and optical communication devices. Going forward, we will leverage our strength in compound semiconductor technology and push R&D for optical sensing technology targeting wider uses also in fields other than communications.

Although there are some differences in terms of timeline and viewpoints between future-oriented fundamental research conducted by the Advanced Research Laboratory and business-oriented development effort, discussion should impart positive stimulation to both. Going forward, we will continue to engage in internal debate and exert our full effort to contribute to the future of Anritsu.

Test and Measurement Business

Contributing to the advancement and enhancement of social infrastructure with high-speed communications networks leveraging cutting-edge 5G technology

Accelerating Initiatives for the New Society that 5G Will Support

Takeshi Shima
Director, Senior Vice President,
Test and Measurement Company President

SWOT Analysis

Strengths — S
- Test & Measurement technology covering wired and wireless communications and a wide variety of solutions
- Global development, sales, and support network
- Extensive partnerships with industry-leading customers and suppliers

Weaknesses — W
- 5G/IoT utilization markets are still under development
- High dependence on the telecommunications market

Opportunities — O
- Increased demand for equipment for development, manufacturing, construction, and maintenance due to expansion of 5G services
- Increasing network speed and capacity through DX for meetings, entertainment, purchasing, and various control functions
- Promotion of 5G utilization (local 5G/IoT) in non-telecom industry fields by taking advantage of higher speed and lower latency (local 5G, IoT)

Threats — T
- Reduced economic activity due to the spread of COVID-19 variants and delay in deployment of 5G services
- Increased tensions over trade and geopolitics, and restrictions on business activities, due to conflicts between major powers
- Business fluctuations for specific customers

Business Areas

Since Anritsu was founded, and over our long history, we have contributed to the evolution of communications technology through innovations that have paved the way for the future of information and communications and by providing society with original and sophisticated products. The Test and Measurement Business delivers measuring instruments and test systems to customers worldwide. These instruments and systems are essential for the quality assurance of communications equipment and facilities that are the core elements of communication network infrastructure.

- Providing test solutions for all phases in the mobile communications market, as represented by smartphones, including chipset development, device development, conformance testing and manufacturing inspections.
- Providing measuring instruments and systems required for evaluating and assuring the quality of connectivity quality of communications modules in IoT devices installed in vehicles, home appliances, and industrial equipment, for use in development and in manufacturing inspections.
- Providing measuring instruments for performance evaluations and manufacturing inspections of network devices that deliver high-definition video and images from data center cloud networks at high speeds over the Internet.
- Providing a wide range of wired and wireless measuring instruments for the manufacturing and construction/maintenance of various types of communication equipment and devices, including the base stations that make up mobile networks.
- Providing monitoring solutions that contribute to the improvement of network operations, including network failure analysis and capacity expansion, by visualizing the network operational status of telecommunications carriers.

The importance of the internet has been reaffirmed in the COVID-19 pandemic and there is demand for its further development as infrastructure supporting new ways of living. With the launch of 5G, we are at a point where anyone can receive high-level services regardless where one lives as high-speed and high-capacity wireless communication is now available.

Anritsu's Test and Measurement Business provides the global market with test and measurement systems that are crucial for establishing and expanding the use of sophisticated communications technology. As a partner to our customers, we will contribute to the development of information and communications technologies, such as 5G, and create test solutions to solve problems in new applications and use cases for communications technology. As we do so, we will accelerate initiatives for addressing the needs of a communication-oriented society.

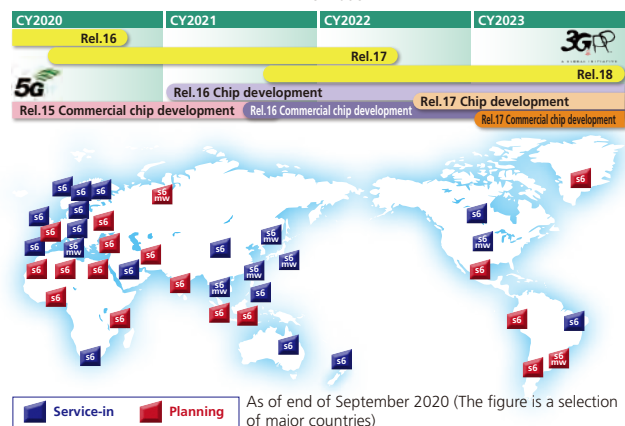## Market Environment and Business Opportunities

In 2019, 5G services were first launched in the U.S. and South Korea, then in China, and now include 143 commercial 5G networks (of varying sizes) in 68 countries around the world. The number of subscribers has also increased to 220-230 million worldwide, led by China (as of the end of

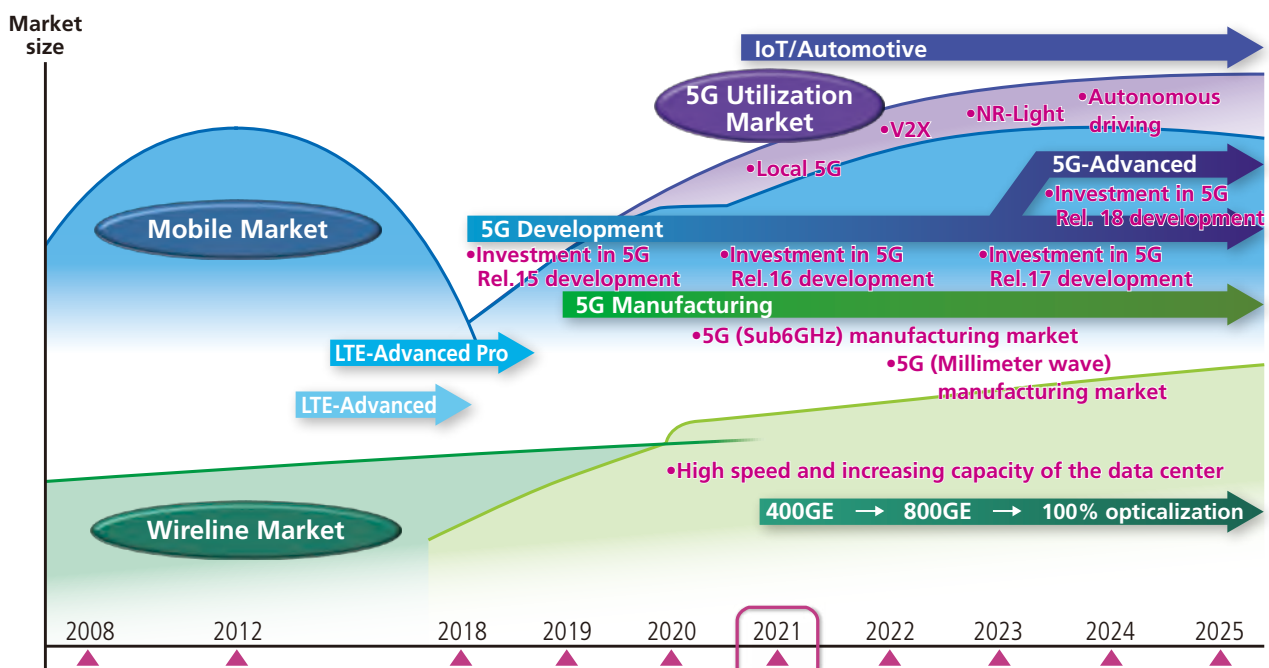December 2020, according to "5G America" and the "Ericsson Mobility Report").

The importance of communications services has risen further as the human race has been confronted with the global turmoil of COVID-19. Face-to-face interaction had been the norm for many types of sales and service activities that have now switched to online formats and there is demand for further development of 5G as the infrastructure supporting this new way of living. The range of fields utilizing 5G is showing breadth and is expected to go beyond current online services to include the remote operation of robots and vehicles, as well as education and healthcare. As these types of social activities continue to be carried out remotely (i.e., a non-face-to-face economy) going forward, it is predicted that there will be test and measurement needs for using AI and VR to deliver high-definition, low-latency video and image information, and to build product assurance frameworks that guarantee quality.

▊ Roadmap of 5G
*Created by Anritsu referring to publicly available information

| Service-in | Planning | As of end of September 2020 (The figure is a selection of major countries) |

▊ Test & Measurement Business: Mobile market trends and Business opportunity

Test and Measurement Business

In terms of technological progress, research has already gotten underway on 5G-Advanced, 6G, 800 Gbps that expect to become the successing technologies for already commercialized 5G for wireless, 400Gbps ethernet for wired and various types of low-power wireless technologies.

Over and above further honing our development of these technologies, we will aggressively develop and propose solutions, while also continuing to work on accumulating expertise for fulfilling requirements that arise accompanying a wider and more diverse range of customer use cases, including local 5G and various remote services such as autonomous driving and healthcare.

Growth Strategy

FY2020 Results
With revenue of 74.8 billion yen and an operating profit margin of 23.6%, we were able to meet our initial targets for FY2020, the final year of GLP2020; however, we did not reach 77.0 billion yen in revenue—the target we set at the beginning of FY2020—due to market impacts from COVID-19. Even under such environment, being able to continue and extend collaboration with global customers pursuing development of cutting-edge technologies was a major success for us to accelerate efforts in FY2021 and beyond. We completed setting up a development environment for engineers to be able to progress development even when they are at home in the early part of FY2020 so that our development plans were progressed almost equivalent to the schedule as when employees were working in office. As a result, we released new products that included fading functions for our 5G base station simulator (MT8000), C-V 2X solutions, a 400 Gbps field tester (MT1040A), and the world's only new-standard Wi-Fi 6E-compliant single-box Wireless Connectivity Test Set (MT8862 A).

Basic Policy for GLP2023
With the completion of GLP2020, we embarked in April 2021 on our new Mid-Term Business Plan, GLP2023. The plan targets considerable growth, with revenue of 100 billion yen and an operati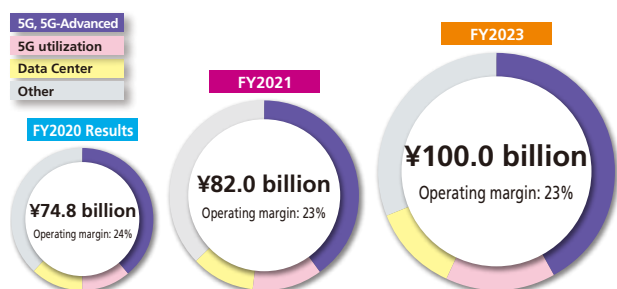ng profit margin of 23%. The vision set forth in GLP2023 is to become a "leading company supporting a communications society built on 5G." As we head toward the peak of 5G smartphone-related business in 2023-24, we aim to accelerate efforts and expand our business in fields further developing 5G or derived from 5G. We have three policies for achieving the plan: 1. Increase the ratio of 5G utilization and solutions for the network infrastructure market within our business portfolio; 2. Transform our business solutions from simple provision of "measurement" tools to provision of value by "resolving through measurement"; and 3. Increase investment in growth areas (5G-Advanced, self-driving vehicles, O-RAN/IOWN). Under these policies, we will continue to create solutions that contribute to a broad range of customers pursuing business leveraging communications technology. We are placing priority on "co-creation" initiatives for collaborating and growing together with customers in each industry as we pursue this three-year activity plan.

Of the three basic policies, we are particularly emphasizing the transformation of our business solutions to provide value by "resolving through measurement," which we recognize as a formidable challenge. As the scope of 5G utilization broadens, there has been an increase in customers who are not skilled in communications technologies unlike traditional chipset or smartphone manufacturers. The challenge for those customers is to identify what kind of business to develop using communication technologies, but not the communications technology itself. We must think of how results gained from our measurement solutions can be used to serve the businesses of these customers, and then convert them into new values. Through collaboration and co-creation, we are working with customers in the new fields such as IoT, automotive, and local 5G operators in order to generate these values. We are adding the findings and the new knowledge gained from this process to Anritsu's advantages, advanced and accurate measurement and testing technologies, to contribute to building a more sophisticated social infrastructure.

Human Resource Hiring and Training
With an untiring commitment to Anritsu's concept of "Original & High Level," we are striving to broadly and globally hire and train talented personnel who align with this commitment and come from a broad, global pool that spans solutions development, manufacturing, and sales. We are expanding our development bases in the U.S. and the U.K., as well as in the Asia region, including the Philippines and other countries. With regard to engineers involved with leading-edge R&D, we are conducting thorough training in Japan (the home base for our development), and then distributing them to the development sites in other countries so that under a consistent mindset based on company policies they pursue development effort taking into account the particular cultures and environments of each country. With regard to manufacturing and sales as well, we are striving to strengthen the

Test & Measurement Business: GLP2023 revenue and operating profit plan

Legend:
- 5G, 5G-Advanced
- 5G utilization
- Data Center
- Other

FY2020 Results
¥74.8 billion
Operating margin: 24%

FY2021
¥82.0 billion
Operating margin: 23%

FY2023
¥100.0 billion
Operating margin: 23%

framework above while simultaneously engaging in person-nel development through trainings, meetings, and human resource exchange programs. The number of female employees working in development and marketing has increased and, going forward, we will further build out programs for advancing the careers of all employees.

Accumulating Intellectual Capital and Participating in External Organizations

In addition to acquiring patent rights for technology emerging from our development, we are also dedicating effort to attaining new technology by joining various external organizations. Currently, we are members of the Third Generation Partnership Project (3GPP) for determining mobile communication standards, and some of our other affiliations include the following groups (for details on activities, please see the section of our website listing affiliations).

1. The Next Generation Mobile Networks Alliance (NGMN Alliance) for deliberating on the status of next-generation mobile communications
2. The Wi-Fi & Ethernet Standards Group, organized under the Institute of Electrical and Electronics Engineers (IEEE)
3. The Open Radio Access Network Alliance (O-RAN Alliance) for intelligent 5G communication networks and for devising open interface specifications
4. The Innovative Optical and Wireless Network (IOWN). A global forum for reviewing new communications platforms comprised of fully optical networks, and edge and wireless distributed computing

SDGs Undertaken by a Test and Measurement Company

By manufacturing and delivering value-added original products at a high level, Anritsu is in agreement with Goal 9 of the SDGs (Build infrastructure, promote industrialization, and foster innovation). We will also grow our contribution to Goal 11 (Sustainable cities and communities) by expanding our business in 5G, including utilization via the IoT. In recent years, natural disasters, epidemics, aging populations, and other social issues that require solutions have been increasing. SNS, photo sharing, video streaming, and other forms of communication over the Internet have received recognition as tools for solving these issues. The communication networks that support human safety and daily living by "connecting" now enable high-speed, large-capacity, ultra-low latency, and multiple simultaneous connections over 5G. 5G will be utilized in industries such as healthcare, agriculture, automotive, and disaster prevention and expected to become a communications infrastructure that solves various social issues such as information disparity, traffic accident prevention, and labor shortages.

Anritsu's test and measurement technology supports the advancement and quality improvement of communications, thereby contributing to creating a more comfortable and convenient society.

We will continue to take part in Anritsu Group's effort of contributing to the "realization of social sustainability" by maximally utilizing not only 5G but also other technologies we own.
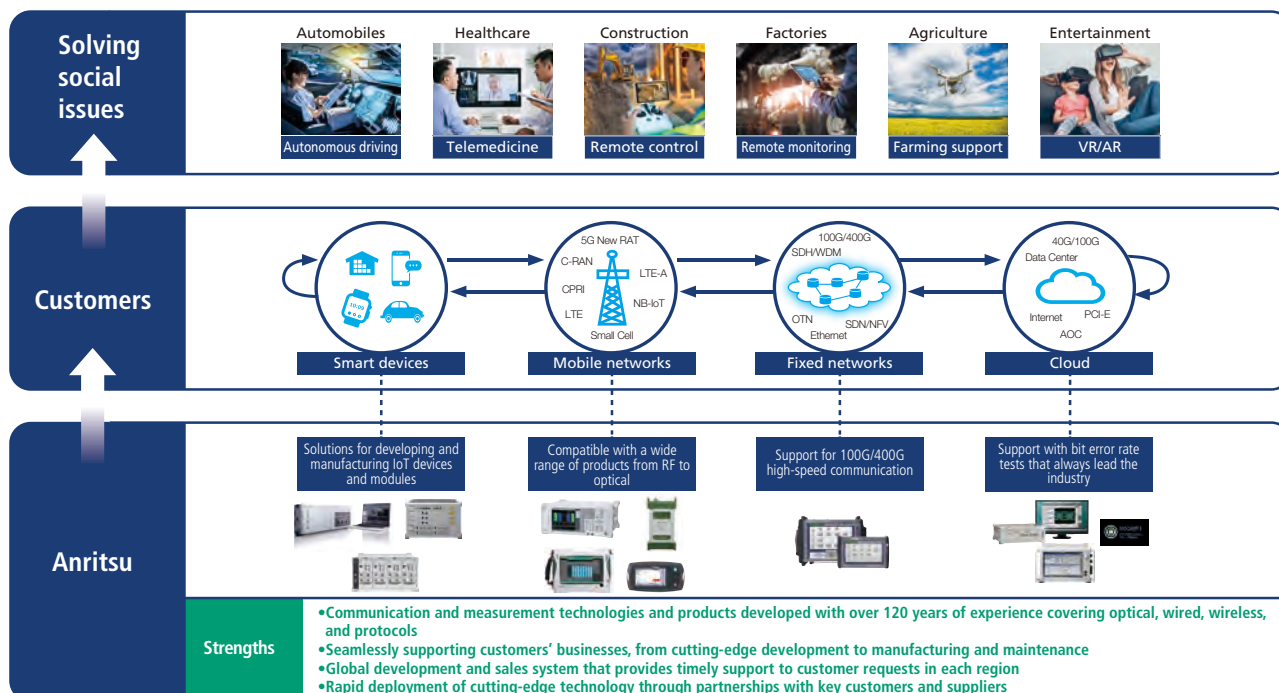
PQA Business

For a sustainable future together, we become the most trusted First-to-Call company in quality assurance.

Masumi Niimi
Director
Senior Vice President
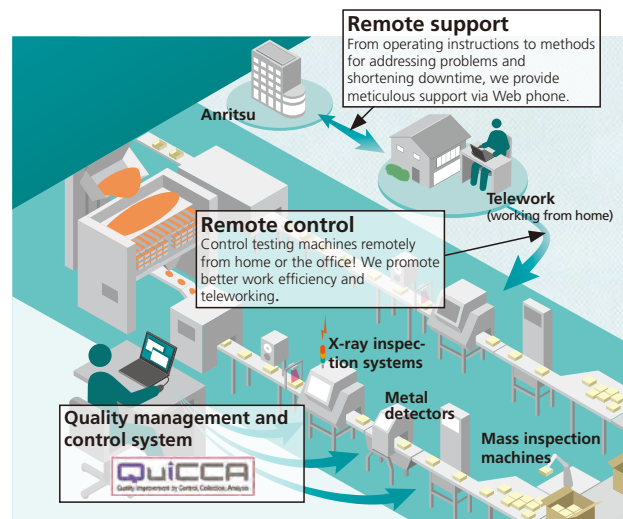PQA Business Group President

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SWOT Analysis

In FY2020, some customers postponed capital investment in testing equipment and other products in order to prioritize investment for combating COVID-19. However, we expect things to return to normal as vaccination is progressing. Seeing the after COVID-19 landscape as an opportunity, we will be making innovations to further advance our business.

Strengths — S
- High-speed, high-precision quality inspection technology for production lines
- Engineering responsiveness that can adapt inspection systems to various workplace environments
- Extensive maintenance service system and experienced technicians in regions of direct deployment
- Track record and top-class market position in the food inspection market in Japan
- Innovation through synergies with other businesses such as local 5G
- Possession of fundamental technologies applicable to the pharmaceutical manufacturing market

Weaknesses — W
- Lack of market recognition in Europe and other regions where Anritsu has yet to fully develop our business
- Lack of recognition in overseas pharmaceutical markets

Opportunities — O
- Growing global demand for safe and secure food
- Advancement of full automation and labor-saving on production lines to improve sanitation
- Growing demand for processed foods as consumers shift to eating at home
- Rapid development of innovative technologies such as AI and IoT

Threats — T
- Very strong competition in large markets such as Europe and U.S.
- Re-spreading of COVID-19 due to new variants, etc.

Business Areas

The PQA Business provides development, production, sales, and maintenance services of quality inspection machines and quality control systems for the food and pharmaceuticals industries globally. We are enforcing localization in major markets around the world so that we can listen to requests and issues of customers and respond quickly and flexibly.

In the food industry, on top of traditional issues such as ensuring quality that promises safety and security, productivity improvement, and stabilized supply, initiatives for realizing a sustainable society such as reduction of food loss and eliminating plastic waste are now required.

Remote support
From operating instructions to methods for addressing problems and shortening downtime, we provide meticulous support via Web phone.

Anritsu

Telework (working from home)

Remote control
Control testing machines remotely from home or the office! We promote better work efficiency and teleworking.

X-ray inspection systems

Metal detectors

Mass inspection machines

Quality management and control system
QuiCCA
Quality improvement by Control, Collection, Analysis

Anritsu's PQA solutions not only provide safety and security for foods and pharmaceuticals while improving our customers' productivity, they also contribute to reducing food waste, a necessary step in realizing a sustainable society.
In quality assurance, a PQA field, in order to achieve our management vision of "Beyond testing, beyond limits, for a sustainable future together," we are pursuing original, high-level quality assurance solutions that address our customers' key issues. Furthermore, along with performing localization aimed at rapidly and flexibly satisfying the diverse needs of customers around the world, we are bringing the technologies developed in the food field into the pharmaceuticals field as we work to achieve further growth and even greater business value.

To help our customers solve those issues, we are going beyond the traditional boundary of quality testing and actively invest in developing system solutions that cover entire areas of our customers' production lines.

Market Environment and Business Opportunities

In FY2020, even under the COVID-19 pandemic, food and pharmaceutical industries continued to be in full operation to support our everyday lives. However, as we had to refrain from entering our customers' factories as prevention measures for COVID-19 spreading, resulting in significant delays in business opportunities. Additionally, some customers postponed capital investment in testing equipment and other products in order to prioritize investment for combating COVID-19.

Looking at the food market by region, in Japan, segments such as the candy market, cosmetics market, and the restaurant industry market were sluggish due to a sudden drop of incoming travel-related demand. On the other hand, although investment is picking up for automation equipment for alleviating labor shortages and maintaining hygienic quality as demand is rising for home foods such as frozen, boil-in-the-bag, and instant noodle products, much time is spent on many of our business negotiations.

Although the U.S. and many other Americas countries have been among the most impacted by COVID-19, the demand for PQA Business in this region for the first half the exceeded that of the previous year thanks to strong demand in the meat market and global customers' continued engagement for planned investment.

Demand is currently on a recovery path but we observed a temporary slump in the third quarter due to many customers prioritizing investment for COVID-19 measures.

In the European market, lockdowns happened one after another in major countries and the situation repeatedly waxed and waned. The demands mainly of major markets such as Germany and France were almost at the level of the previous year up until third quarter. However, since the fourth quarter, the situation has remained unstable as many projects have been postponed due to re-spreading of infections in European countries.

In China, where the COVID-19 pandemic converged ahead of the rest of the world, the market has recovered from the sluggish previous year and remained strong. In particular, the segment for home consumed foods such as frozen foods, noodles, and precooked foods was strong. Meanwhile, Asian markets other than China were slow from the beginning of the year as economic activities became sluggish due to measures for the COVID-19 pandemic.

We expect the COVID-19 pandemic will accelerate the trend towards fully automated or semi-automated production lines. There is still much room for further automation in the quality testing processes where the tasks are complicated and sophisticated judgements are required. Leveraging this growing need, we will be proposing further advanced and refined automation solutions going forward.

In the pharmaceuticals market, quality assurance requirements are even stricter than those in the food market.

For more than half a century, Anritsu has provided customers in pharmaceutical production with checkweighers and other testing equipment. Although we have an extensive track record in Japan, our name awareness is not particularly high in overseas pharmaceuticals markets.

Many global pharmaceutical companies have their headquarters in the U.S., Europe, China, or India, and we plan to expand our business into these markets going forward.

Fiscal Year 2020 Review

The following are the main new products we launched during the GLP2020 period.

Main New Products for the Food Market

- "QUICCA3," Overall Quality Management and Control System that contributes to productivity improvement by visualizing production and quality status
- "KXE7522," Dual Energy Sensor X-ray Machine with significantly improved contamination detection performance
- "M6-h" Series Free Fall Metal Detectors, which detects and removes metal contamination for granular foods and raw materials during production process.

PQA Business

Also, to help the needs of detecting faulty product packaging as food shelf lives grow longer, we have also promoted X-ray inspection machines specialized for detecting ingredients caught in the seal of the food packages.

QUICCA3
General quality management and control systems

KXE7522 X-Ray
Inspection system with dual energy sensor

KDS0010VNW
M6h series of free fall metal detectors

Main New Products for the Pharmaceuticals Market

- "KDS1004PSW" metal detector specialized for contaminant detection in pills and capsules for the pharmaceuticals market
- "QUICCA PHARMA" general quality management and control system for pharmaceuticals
- "GS1" Auto-Checker with seal detection function supporting traceability requirements for pharmaceuticals

For the aim to grow our PQA Business on the global level, we have worked to build a structure that can quickly and flexibly support diversified needs of different regions. However, we have been slightly behind the plan and were not able to reach the targets set in the GLP2020 during the period.

KDS1004PSW
Metal detector for pills and capsules

QUICCA PHARMA
Overall quality management and control system for the pharmaceuticals market

GS1
Auto-checker with seal detector

Meanwhile, we have drastically changed the organization in order to strongly promote our three initiatives raised when the plan was originally set, namely "continuous launch of world's best-performing machines," "transforming into a global company," and "penetrating the pharmaceuticals market."

Under a new system, we will accelerate efforts to achieve globalization and innovation by fully leveraging managerial resources that include the Anritsu Group's technologies and human capital.

Growth Strategy

GLP2023 Basic Policy

GLP2023, launched in April, establishes a vision for the PQA Business of "For a sustainable future together, we become the most trusted First-to-Call company in quality assurance," and the business aims to achieve ¥27 billion in segment revenues and a 10% operating profit ratio by FY2023.

Guided by the Group's Vision "Beyond testing, beyond limits, for a sustainable future together," we will bring our quality inspection technologies that play an active part in production lines, an area of Anritsu's strength, combined with advanced technologies and innovative services that include AI and IoT in order to build solutions to comprehensively support our customers' quality assurance activities.
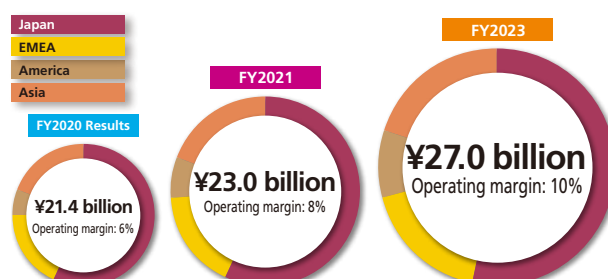
We will also boost investment ratios for the development of new sensing and information systems, and strategic products for the pharmaceuticals market.

Also, we will enhance our organizational structure that gathers feedback directly from local customers around the world and enables prompt provision of products and services that meet local customers' needs.

Furthermore, leveraging the technologies and know-how of "quality assurance" acquired in the food production field into the pharmaceutical field, we will make the pharmaceuticals market the second pillar for the PQA Business.

▌ PQA: GLP2023 Revenue and Operating Profit Plan

- Creation of solutions that resolve critical issues of customers
- Value creations beyond "testing", as well as rapid and appropriate response to the diversified needs of regions around the world
- Enhance profitability through advancement of X-ray inspection machines, improving presence in pharmaceutical market and enforcing operational innovations

Japan
EMEA
America
Asia

FY2020 Results
¥21.4 billion
Operating margin: 6%

FY2021
¥23.0 billion
Operating margin: 8%

FY2023
¥27.0 billion
Operating margin: 10%

Talent Recruitment and Development

To make strides with GLP2023, we will be aggressively recruiting engineers for cutting-edge technologies in such areas as image and signal processing, IoT, deep learning and other aspects of AI, as well as non-destructive sensing, that are the areas of focus for us.

We will promote growth of people and technology through interaction broadly with outside research organizations by removing insistence on internal effort.

Relationships with Outside Organizations and Collaboration with Leading Companies

Anritsu is actively collaborating with customer companies and other companies in the industry. For PQA Business, we have become a member of more than 20 industry associations in Japan including the Japan Measuring Instruments Federation, Japan Inspection Instruments Manufacturers' Association, and Japan Packaging Machinery Manufacturers Association. Furthermore, we have joined PMMI (Packaging Machinery Manufacturers Institute), a U.S.-based organization with more than 900 member companies.

In addition to interacting with and learning about issues faced by our customers in the industry by actively participating in activities of those associations, we contribute to solve these issues by working together with industry-leading companies and research institutes.

SDGs Undertaken by a PQA Business

It is a common wish of all humankind to bring about a society wherein everyone lives in safety and good health. By effectively using limited resources in sustainable ways and developing technologies for processing foods to make them safe and long-lasting, we hope to reduce the number of people suffering from hunger as much as possible.

Through provision of PQA solutions that support the stable supply of safe and secure foods and pharmaceuticals, as well as proactive efforts for food loss reduction, Anritsu will continue contributing to the realization of the society where everyone can always live in good health.

Solving social issues

Increasing the sophistication of quality assurance for food and pharmaceuticals to achieve:
・A safe and secure society
・A sustainable society with little food loss

Customers

Anritsu

| Automatic electronic weighing machines | X-ray inspection systems | Metal detectors | Checkweighers | Quality management/ control systems |

Strengths
• High-speed, high-precision, quality inspection technology for production lines
• Engineering capability to adapt inspection equipment to various food manufacturing environments
• Extensive maintenance service system and experienced maintenance engineers in Japan
• Past record and top-class market position in the food inspection market in Japan