**Imaging-IoT Solutions Business**

October 6, 2021

Toshiya Eguchi,

Executive Vice President and Executive Officer

Responsible for Imaging-IoT Solution Business Unit and Visual Solutions Business Unit

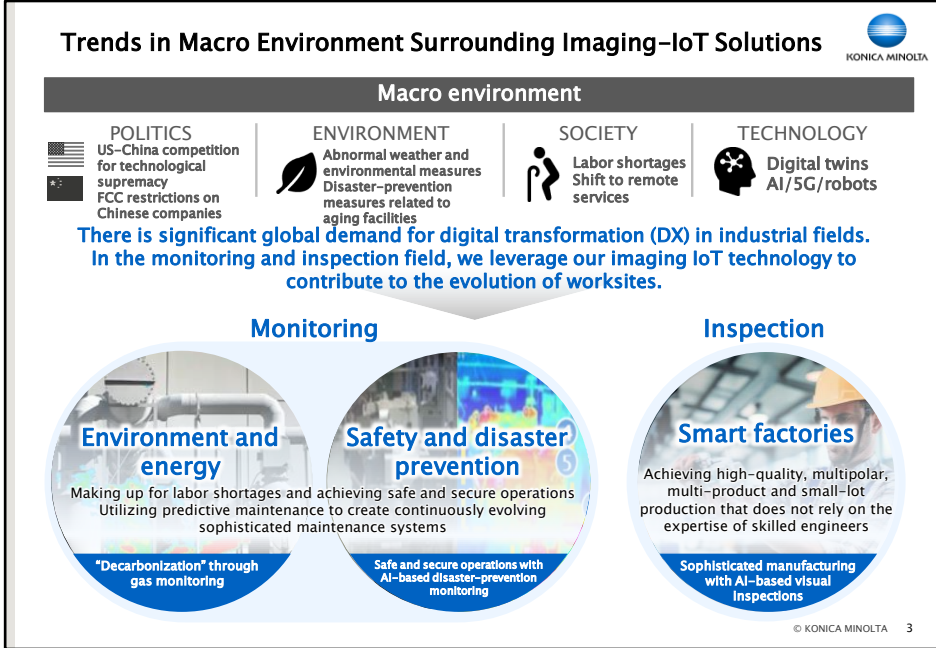Let me explain imaging-IoT solution business.

For 150 years, we have inherited our proprietary "imaging technologies" in cameras, copiers, medical diagnostic equipment, and other products as our DNA. By multiplying this DNA with the cutting-edge AI and IoT technologies, we have acquired the new advantage of "visualizing the invisible ."
In the intelligent monitoring and inspection image analysis services market, which is expected to grow rapidly in the future, imaging-IoT solution business aims to contribute to the evolution and safety of worksites and grow significantly as a new pillar of our business.
We have learned in the past that it is difficult to grow a business significantly in the field of businesses that provide solution services based solely on the strengths of our proprietary technologies. Therefore, we believe that a mechanism for growing together through collaboration with partners is needed, and we started to develop the "FORXAI Platform" in 2016 and announced it in November last year.
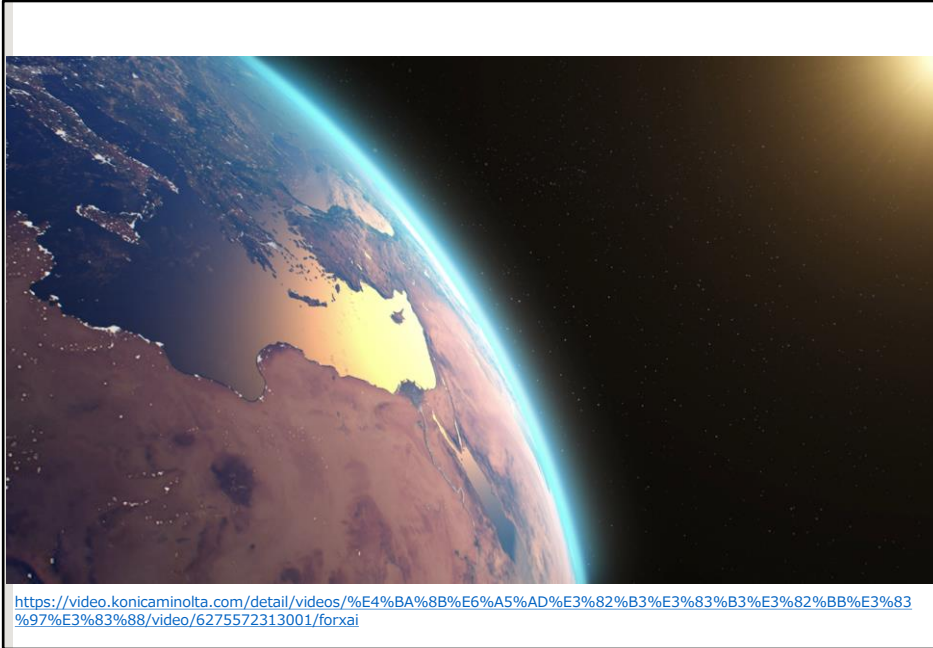Using this FORXAI, we will work together with our partner companies to accelerate the resolution of social issues and expand our business on a global level.
Today, I will explain the concepts and progress of those efforts.

**Trends in Macro Environment Surrounding Imaging-IoT Solutions**

**Macro environment**

| POLITICS | ENVIRONMENT | SOCIETY | TECHNOLOGY |
|---|---|---|---|
| US-China competition for technological supremacy  FCC restrictions on Chinese companies | Abnormal weather and environmental measures  Disaster-prevention measures related to aging facilities | Labor shortages  Shift to remote services | Digital twins  AI/5G/robots |

There is significant global demand for digital transformation (DX) in industrial fields. In the monitoring and inspection field, we leverage our imaging IoT technology to contribute to the evolution of worksites.

**Monitoring**  —  **Inspection**

**Environment and energy**
Making up for labor shortages and achieving safe and secure operations Utilizing predictive maintenance to create continuously evolving sophisticated maintenance systems
"Decarbonization" through gas monitoring

**Safety and disaster prevention**
Safe and secure operations with AI-based disaster-prevention monitoring

**Smart factories**
Achieving high-quality, multipolar, multi-product and small-lot production that does not rely on the expertise of skilled engineers
Sophisticated manufacturing with AI-based visual inspections
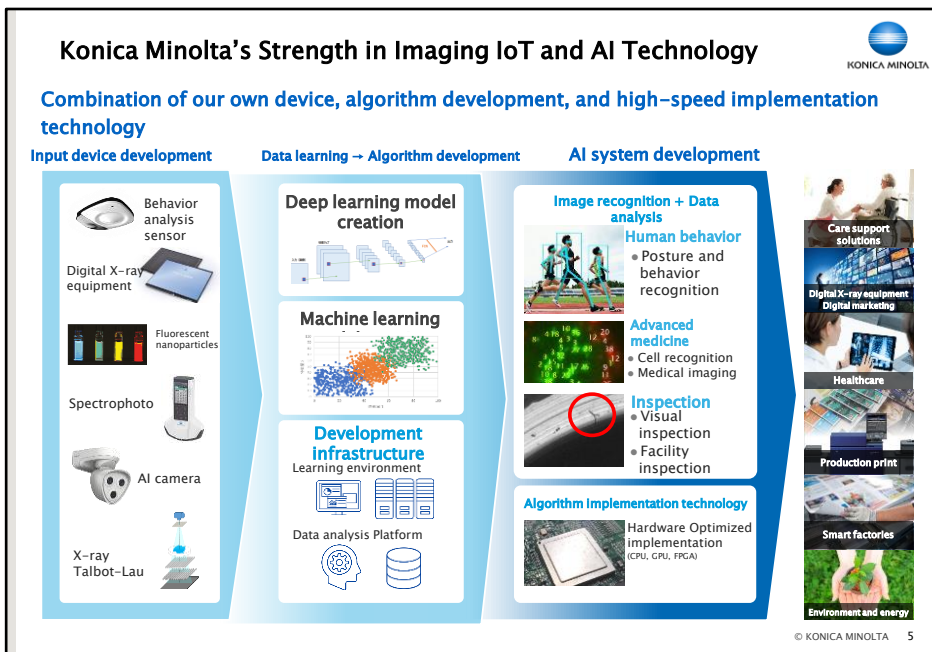
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We feel the changes in which there are rapidly increasing the importance and urgency of issues that customers need to resolve, and the demands of customers for workflow transformation according to changes in society and the environment, as well as technology evolution.
We have compiled 2:30 video of the world, in which we are aiming to address the various challenges of these customers by using "imaging IoT technologies" to assist them in solving issues and progressing DXs of them. Please take a look at this first.

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https://video.konicaminolta.com/detail/videos/%E4%BA%8B%E6%A5%AD%E3%82%B3%E3%83%B3%E3%82%BB%E3%83%97%E3%83%88/video/6275572313001/forxai

2:30 video
You can watch the video on the website.

Konica Minolta's Strength in Imaging IoT and AI Technology

I would like to add a few explanations of the strengths of "imaging IoT technologies," which were introduced in the video that you have watched. Our technology has 3 strengths.

The first is to combine our core technologies of "materials, optics, imaging, and nanofabrication" to develop and possess unique sensor devices that can only be made by manufacturers.

The second point is using the data acquired from that sensor device. Since 2015 we have developed an environment for developing AI algorithms using deep learning technology as one of the earliest companies in Japan. To date, we have enhanced our imaging AI technology and possessed advanced AI human resources.

The third point is that we possess the high-speed data-processing technology that we have cultivated in MFP and medical devices, while it is critical to posses the technology that implements the developed algorithms into systems for providing customers.
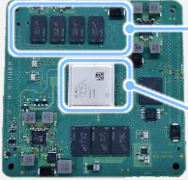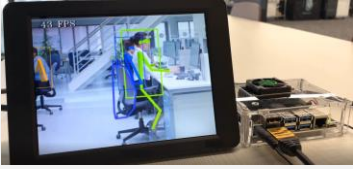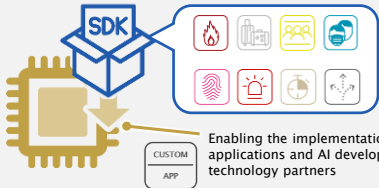
There are a limited number of companies that can combine these three technologies. In particular, we are able to sophisticate technologies in the fields of human behavior, advanced healthcare, and inspection, and provide systems that solve complex customer issues. This is one of our strengths in technology that surpasses IT companies and other companies as the

manufacturer that has strength in imaging technology.

AI Technology for Monitoring Solutions

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**Strengthening our competitiveness in the intelligent camera field, where high growth is expected**

**Technology**

Making more competitive products through joint development with MOBOTIX

Memory
(Capable of multistreaming on 4K cameras thanks to 4x the amount of storage)

AI processing chip (2.4x processing capabilities compared to our conventional ones)

Differentiation through Konica Minolta AI technology

Object/outline/skeletal identification/person tracking (simultaneous)

**Solutions**

Speeding up development through co-creation with technology partners

SDK

CUSTOM APP

Enabling the implementation of applications and AI developed by technology partners

Sales growth with AI camera solutions

Recognition of human attributes

Detection of facility abnormalities

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I would like to explain how we can compete by leveraging the strengths of our "imaging IoT technology" in detail with an example of our monitoring solutions.
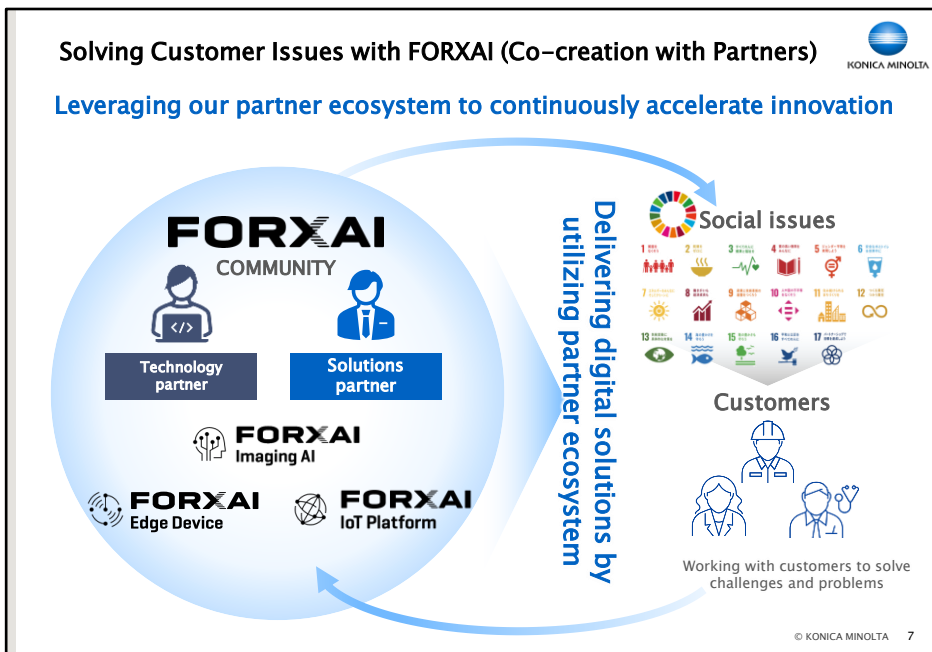
The cutting-edge AI cameras jointly developed by Konica Minolta and Mobotix GmbH, a German group company, are equipped in a circuit with industry-leading processing capacity.

Our world's fastest-class AI algorithms, which enable to simultaneously recognize the people and objects, demonstrate superior performance to IT giant companies in the International Convention of Computer Vision. Combining the strengths of these two technologies, hardware and AI algorithms, we are able to realize the high performance and functions required for AI image analysis. Our strengths are recognized by partner companies, and projects for joint development are expanding.

In addition, this AI camera offers an open environment for the development of applications to be implemented in cameras, allowing technology partners to easily customize to meet customer demands by themselves.

In this way, we are able to enhance our competitiveness in the high-growth rate "intelligent image analysis market" by highlighting the strengths of our AI image analysis service through "imaging IoT technology."

Solving Customer Issues with FORXAI (Co-creation with Partners)

Leveraging our partner ecosystem to continuously accelerate innovation

Next, I will explain how we will expand our business by utilizing our FORXAI platform, which consists of the three technologies of imaging AI, edge device, IoT-platform that we have developed.

In recent years, the needs for AI image analysis services has grown rapidly. But customer issues have become more complex year by year, and in some cases, we have been unable to respond quickly to solve them on our own.

At the same time, many other companies, even technology-related ventures with outstanding technologies, are unable to develop their businesses because they do not have the infrastructure such as IoT-platform to deliver the developed solutions to their customers. Also, solution-development companies with customer channels in various industries also face difficulties in meeting customer requests because they do not possess the AI imaging technology, which requires a high level of expertise. So, each of these companies face challenges currently.

Accordingly, we have decided to provide our IoT-Platform and our edge devices and AI imaging technologies openly to enable to complement together by bringing the assets of each of these companies. We proposed a structure of FORXAI community that enables us to quickly provide services to our customers with lower initial investments with partners.

Many companies have experienced POCs as highest hurdles to new service
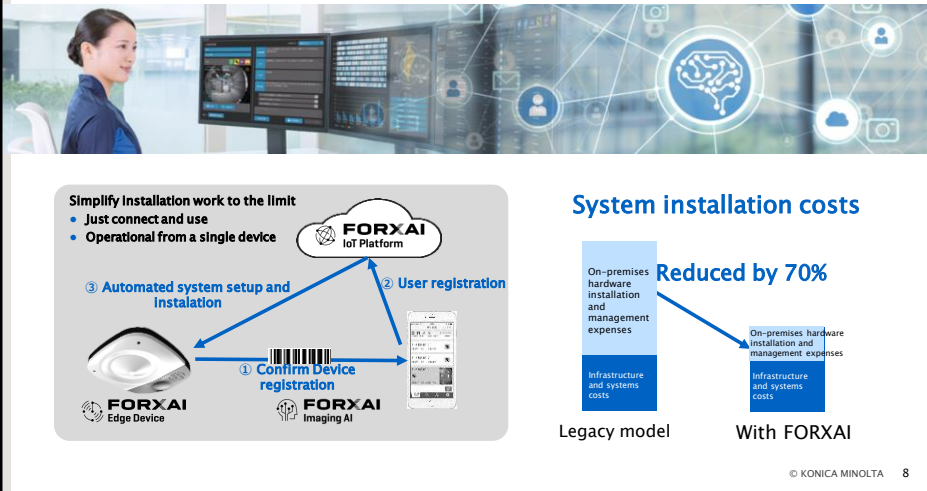
creation, and many partners are empathizing with the idea of our FORXAI strategy. Cooperation is accelerating.

**FORXAI In-house Utilization Example – Nursing Care Solutions**

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**Utilizing FORXAI IoT platform to significantly reduce system installation costs**

**Simplify installation work to the limit**
- Just connect and use
- Operational from a single device

FORXAI IoT Platform

③ Automated system setup and instalation
② User registration
① Confirm Device registration

FORXAI Edge Device
FORXAI Imaging AI

**System installation costs**

On-premises hardware installation and management expenses
**Reduced by 70%**

On-premises hardware installation and management expenses

Infrastructure and systems costs

Infrastructure and systems costs

Legacy model          With FORXAI

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We began developing our FORXAI platform in 2016 and have completed our primary development investments. It has already been utilized in a variety of in-house businesses. Here is an example of how the business operations of solution services have been streamlined by using FORXAI.
Our DX support services for nursing care facilities help them streamline nursing care operations by providing a system which detects and informs changes in the behavior of inhabitants using sensor devices.
By utilizing FORXAI for setting up the system at contracted nursing care facilities, we can do it remotely anywhere in Japan. It enables operational monitoring and remote version upgrades 24 hours and 365 days.
As a result, system installation costs have been reduced by 70%. Not only has the number of facilities that can install the system significantly increased in a month and business efficiency increased, but also FORXAI has enabled us to continue to connect with customers by data. This has led to new high value-added services through collaboration with partners by leveraging on-site data.

Next, I will explain the growth plan of this business by dividing it into Mobotix organic businesses and the other new business, which have differing business models.

Regarding Mobotix's organic businesses, we will expand sales by proposing differentiated, high-performance AI cameras. We target the intelligent camera market, which can be expected to grow at a high rate of 20% or more.

We will acquire market shares in North America by taking advantage of opportunities in the U.S.-China trade restriction and increasing the presence with reliability due to Made in Germany.

As for the monitoring and inspection service businesses as the new business, we will introduce examples later on. We will efficiently expand our business by utilizing FORXAI by accelerating the development of solution packages that can be deployed globally through partnerships with industry players who have contact with customers.

Through these strategies, we aim high growth of the entire sales plan for this business by strengthening AI intelligent devices with analytical functions and solution package development.

In FY2025, sales will continuously improve our profit by reducing operating costs and the SG&A ratio by utilizing FORXAI, with the aim of increasing the software and recurring ratio to 20% or more of total sales.

**Quickly offering solutions by co-creating with technology and solution partners**

**Technology partners**

Continuously enhancing our range of partners with cutting-edge technology

FORXAI Imaging AI

AXELL CORPORATION
TRUST GAITH & COMPANY
cinnamon AI

HIPERDYNE
iSiD
+ three other companies

FORXAI Edge Device

AVNET Reach Further
AVAL DATA
socionext

FUJITSU
HAILO Empowering Intelligence
:::i·PRO

FORXAI IoT Platform

ACCESS
eSOL
cybertrust

silex technology
LINEO Solutions Powered by Cybertrust Japan
+ one other company

**Solutions partners**

Collaboration with partners utilizing FORXAI

ASTRO
EAGLE EYE NETWORKS
OKI Open up your dreams

Sky
Daitron
talk

Marubeni
Marubeni Network Solutions
MOBOTIX

YANMAR

Between announcement of FORXAI (Nov. 2020) and Oct. 1, 2021

Partnered with 30 new companies

* Total of 85 companies, together with partners as of Oct. 2020

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Regarding FORXAI, collaboration with partners is vital to accelerate growth in this business. I would like to explain the progress in this area.
Since announcement of FORXAI in November last year, we have been interested by many companies, and have concluded FORXAI partner agreement with 30 new companies.
Through collaborative development with "technology partners" that have strengths in respective fields, we have a lineup of technologies that enable us to develop products that meet diverse and sophisticated needs. In addition, we are accelerating the development of new solution services by receiving many contacts from "solution partners" such as trading-company-affiliated solution providers with channels in various industries and Systems Integrators  with a wide range of system development experience.
It took time to win and close deals on a case-by-case basis, which had been an issue in the past. Also, It was difficult to speed up the development by only our own technical resources, and there was some limitation in the extent to which we were able to respond. And our partner companies had the same issue. The issue was resolved through this system.
 We believe that FORXAI community has enabled us to build Win-Win relations.

**Diverse Range of Examples of FORXAI Utilization**

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**Utilizing FORXAI technology to enhance and deploy a diverse range of solutions**
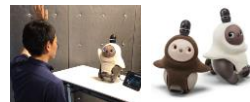
| Smart factories | Safe movement support with 3D LiDAR | LOVOT, a robot for home use |
|---|---|---|
| Daitron Co., Ltd. | Collaborative company: Sohgo Security Services Co., Ltd. | GROOVE X, Inc. |
| Enhancing productivity and transferring technical expertise | Reducing accident risk and burden of management | Creating a society where people and robots work together |
| People flow marketing | Remote sensing for agriculture | Runalytic |
| Marubeni Network Solutions Inc. | Kobe City, KOBE SHU-SHIN-KAN BREWERY, LTD., JA Hyogo Rokko | Sports gyms and equipment stores |
| DX of marketing strategy | Regeneration of phosphorus fertilizer for highly profitable agriculture | Using DX to enhance service value |

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Our collaboration with FORXAI partners has created new opportunities for partner collaboration and services that have not been available in the past. I would like to introduce these opportunities.
With Daitron, we are enhancing productivity in smart factories. With Sohgo Security Services, we aim to reduce accident risk as safe movement support in factories. With Groove X, we are targeting to create a society where people and robots work together. With Marubeni Group, we are working to DX for store marketing. With Kobe City and KOBE SHU-SHIN-KAN , we aim regeneration of phosphorus fertilizer and highly profitable agriculture. With sports-related companies, we are working to create DX services.
All of these cases are not one-time service development projects. We are discussing the expansion of jointly developed services. We are working on them as projects that lead to expand our business together with our partner companies.

FORXAI Sales Channels and Business Model
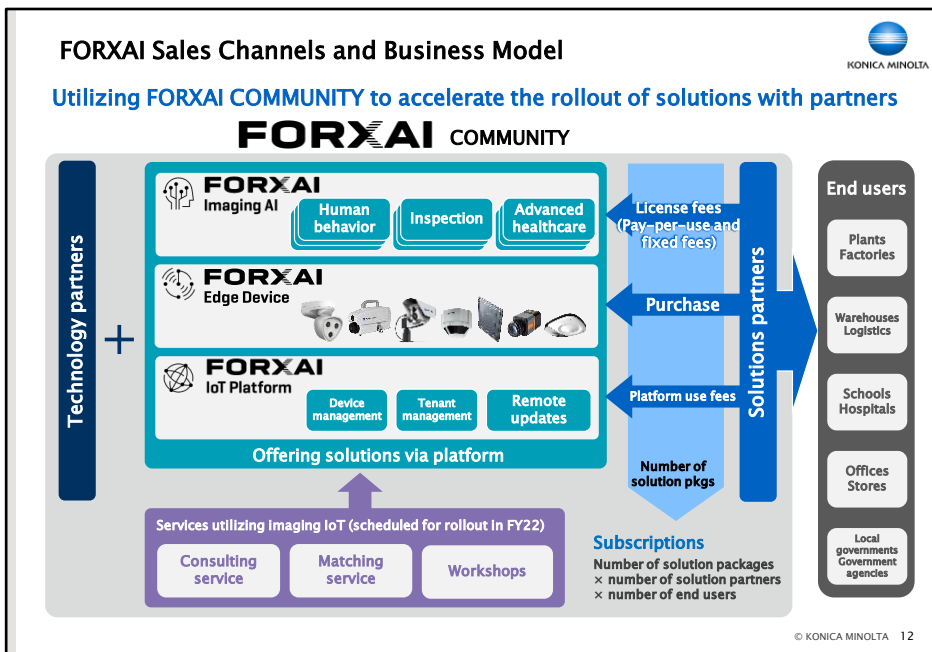
Here, I will explain what business model the business utilizing FORXAI takes, and how players in FORXAI community are involved and expand their businesses.

I explain in the case of a "solution partner" that has a channel to end users in various industries that could not be approached only by us. In the case, it acquires projects that require advanced imaging AI analysis technology with FORXAI technology to develop services.
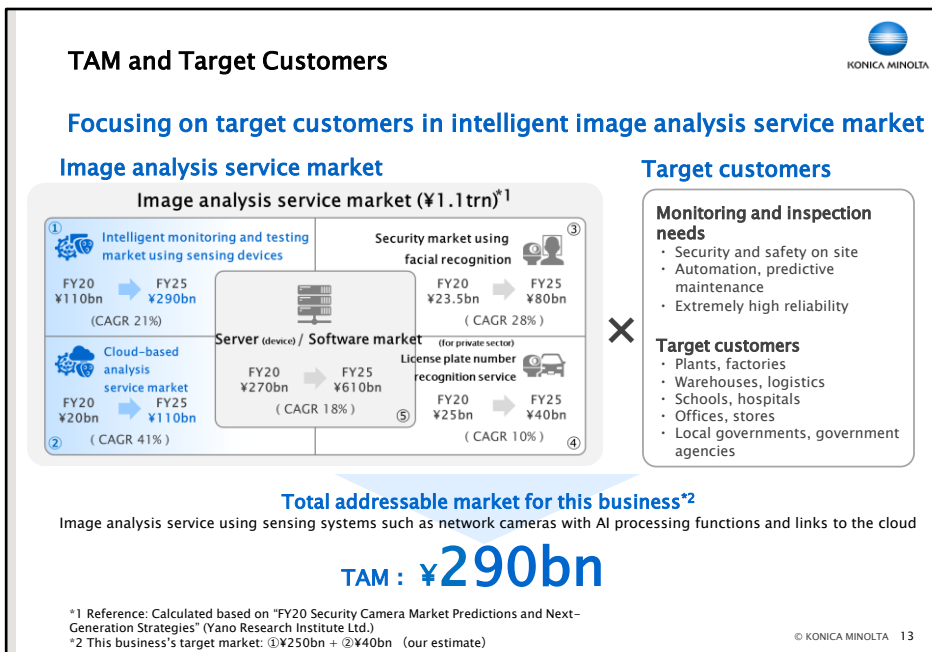
Solution Partners combine the technologies we and our technology partners provide in FORXAI community and are able to develop new solution services on their own using the development-environment SDKs we provide. In this case, the solution partner is responsible for everything from service development to delivery and operation. And the developed solution package is registered in the community as an asset for the developer and can also be provided to other partners with a fee.

In this case, our and our technology partners' revenues are distributed as subscription agreements, such as license fees for AI libraries utilized in the services they provide, device purchase fees and platform use fees.

One existing solution partner has already created more than 10 solution package development projects alone, which can be generally utilized. We believe that we and partner companies will be able to establish a highly

profitable business model and grow together by firmly designing the billing of subscription contracts in line with the business growth phase without much increase in development investment in the future.
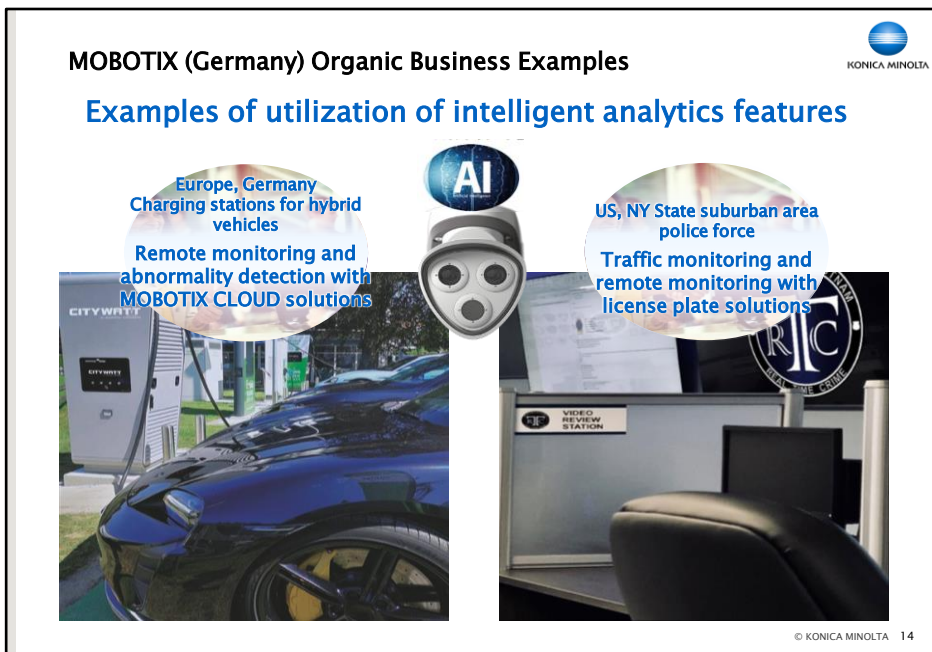In the area of AI image analysis, there are many complex and advanced development projects that our solution partners cannot develop on their own. Therefore, we will continue to enhance our FORXAI technologies while also responding to customized development to meet customer demands. Also, we will provide consulting and matching services as menu of imaging IoT utilization services. Therefore, we will develop services that enhance our development capabilities and profitability as the community

TAM and Target Customers

Focusing on target customers in intelligent image analysis service market

Image analysis service market

Image analysis service market (¥1.1trn)[1]

① Intelligent monitoring and testing market using sensing devices
FY20 ¥110bn → FY25 ¥290bn
(CAGR 21%)

Cloud-based analysis service market
FY20 ¥20bn → FY25 ¥110bn
② (CAGR 41%)

Server (device) / Software market
FY20 ¥270bn → FY25 ¥610bn
(CAGR 18%)
⑤

Security market using facial recognition
③
FY20 ¥23.5bn → FY25 ¥80bn
(CAGR 28%)

License plate number (for private sector) recognition service
FY20 ¥25bn → FY25 ¥40bn
(CAGR 10%) ④

Target customers

Monitoring and inspection needs
· Security and safety on site
· Automation, predictive maintenance
· Extremely high reliability

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Target customers
· Plants, factories
· Warehouses, logistics
· Schools, hospitals
· Offices, stores
· Local governments, government agencies

Total addressable market for this business[2]
Image analysis service using sensing systems such as network cameras with AI processing functions and links to the cloud

TAM : ¥290bn

*1 Reference: Calculated based on "FY20 Security Camera Market Predictions and Next-Generation Strategies" (Yano Research Institute Ltd.)
*2 This business's target market: ①¥250bn + ②¥40bn （our estimate）

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Regarding the market for this business, we are targeting the market for intelligent monitoring and inspection, which are expected to grow and enables us to leverage the strengths of our devices and technologies. We are also targeting cloud-based analysis services, which are expected to grow at a high level in the future. We will aim the market of ¥290 billion in FY2025 and deploy the business.
In terms of the way we conduct our business, we will clarify the providing value  to each customer segment, and continue to respond to mission-critical social issues that enable us to leverage our imaging IoT technology superiority as "visualizing the invisible ." In this way, we will work to expand our market shares by being recognized as an essential company from around the world.

MOBOTIX (Germany) Organic Business Examples

Examples of utilization of intelligent analytics features

Europe, Germany
Charging stations for hybrid vehicles
Remote monitoring and abnormality detection with MOBOTIX CLOUD solutions

US, NY State suburban area police force
Traffic monitoring and remote monitoring with license plate solutions

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In the following sections, I will introduce some examples of the results that have been achieved in accordance with the respective strategies for Mobotix organic business and new businesses, which have been explained in the sales growth plan.

The first is an example of Mobotix original business gained through the appealing value of its intelligent functions and the high reliability of being made in Germany under U.S.-China trade restriction.

The left side is a case in which we won a large contract by proposing a solution with abnormality detection functions via the cloud to a company that operates an increasing number of charging stations for hybrid vehicles over a wide area in Europe.

The right side is a case in which we won a large contract by proposing a solution with traffic monitoring and license plate reading functions to police force in North America.

Both of these are examples of the success of a strategy that highlights the strengths of the combination of the reliability and intelligent monitoring functions of Mobotix Camera.

MOBOTIX + Monitoring: Sales Growth with Cloud VMS*

**Realizing a recurring service model (continuous fees) with Cloud VMS**

**Monitoring services for offices and stores**
Easier adoption thanks to cloud–based service
Better monitoring thanks to AI analysis

Example: CheckSmart (US)

500 stores across the US (finance)

Rapid increase in stores as a result of acquisitions

Cameras: 4,000 (FY21)

$120/yr/unit, continuous fixed fees

* VMS: Video Management System

**Partner companies**

abp Cloud VMS

**Ensure profitability through expansion within the industry, increasing the number of licenses, and growth in the fee–based model**

**Accelerate entry into regions such as Europe and Asia**

**Leverage FORXAI Imaging AI to develop better solutions and increase value offered and recurring business**

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The second is also an example of a Mobotix organic business. In collaboration with U.S.-based abp , which specializes in video management using the cloud, we were able to win large-scale orders. We responded to the needs of major financial companies with branches expanding across the U.S. which were to "make it easier to install in additional branches" and "strengthen intelligent monitoring functions."
It is an example of being able to implement a recurring model for monitoring function service. Going forward, we will expand to other customers and regions as one of FORXAI service package. And we will strengthen our approach to proposing such solutions as a strategy for high earning models.

New business + Monitoring: Video Analytics Solution

Using imaging AI technology to solve manufacturing, logistics, and warehouse issues related to quality inspections, occupational health and safety, etc.

Imaging AI services for manufacturing, logistics, and warehouses
Automating visual inspections as part of manufacturing processes, safety and security, and workflows for inventory management, etc.

H2 FY21 sales target: €1.0m+
Pipeline: 30+ end user companies
50+ partner companies
Example
Major engineering services company
● Fortune 500 global conglomerate
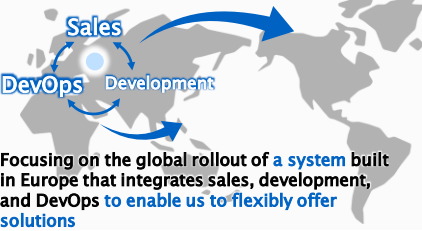● Considering simultaneous rollout across plants in North America, Europe, and APAC

Utilizing imaging AI technology to automate workflows that rely on human labor in manufacturing, logistics, and warehouses
Visual surface inspection

FORXAI
Video Analytics Solution
Occupational health and safety
Inventory management

Sales
DevOps   Development

Focusing on the global rollout of a system built in Europe that integrates sales, development, and DevOps to enable us to flexibly offer solutions

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The third example is the development and deployment of a monitoring solution as a new business in Europe.

In Europe, there is a strong interest in DX in the manufacturing industry. And there is a demand to automate workflows with imag ing AI analysis technology for various issues such as good visual surface inspection, occupational safety, and inventory management. Many inquiries have been received for "Video Analytics Solution" based on our FORXAI technology. Projects by major engineering services company is being considered to expand to customer's plants globally at the same time. It is a good example of how our initiative will lead to efficient service sales.
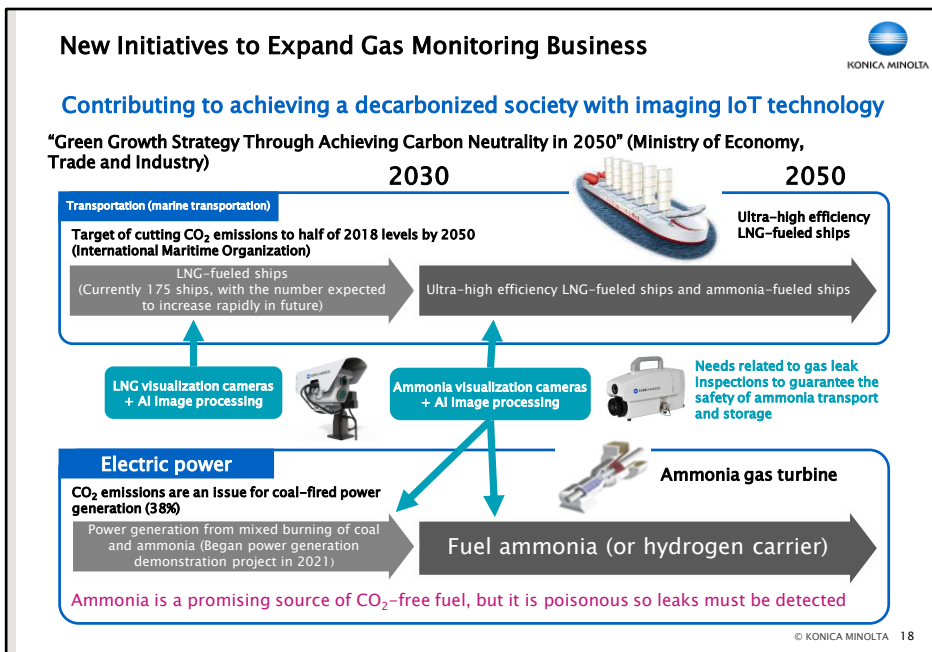
Another of our strengths is that our European R&D, sales companies, and DevOps entities, which realize agile development, work together to provide solutions and quickly respond to customer demands in local markets. The initiative brings us the reliability from customers. In this way, FORXAI will be developed as a global brand.
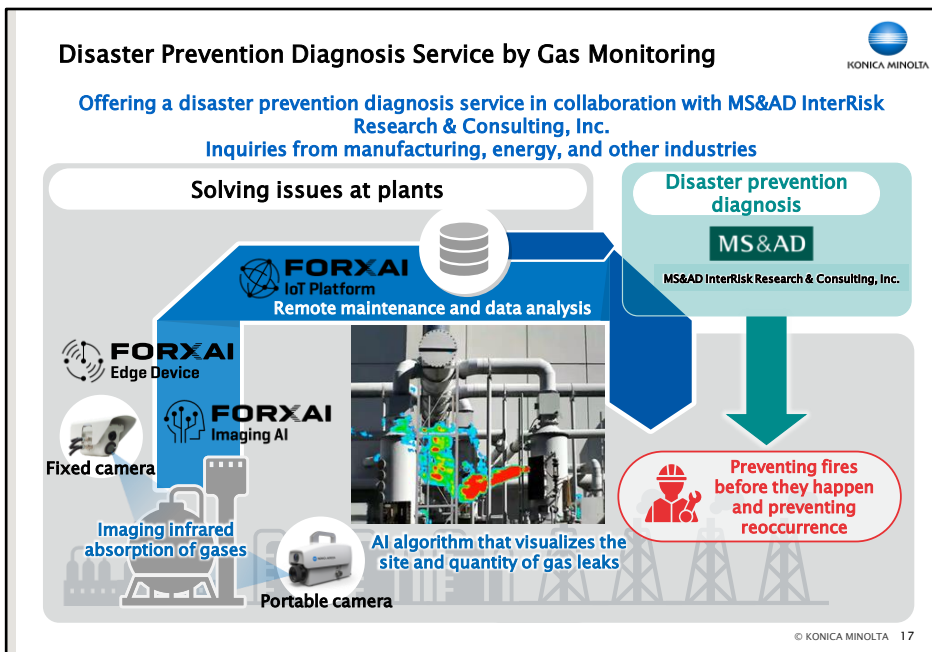
The fourth example is "gas monitoring" solution services as a new business. As you can see on the video, we have the "technology for visualizing invisible dangerous gases".

At the beginning of development, we made proposals for installing this system to customers of chemical plants. However, we have launched a disaster prevention diagnostic service using our gas surveillance cameras in collaboration with MS&AD since last fiscal year. As a result, we have received an increasing number of inquiries from various industries other than chemical plants, including the variety of manufacturing industry and the energy industry.

With the recent increase in fire accidents due to the aging of plant facilities, people raise awareness of corporate safety management and crisis management to protect the supply chain. In response, we, will use FORXAI technologies to respond to the needs to prevent fires at various manufacturing sites together with our partner companies, including the insurance companies.

New Initiatives to Expand Gas Monitoring Business

Contributing to achieving a decarbonized society with imaging IoT technology

"Green Growth Strategy Through Achieving Carbon Neutrality in 2050" (Ministry of Economy, Trade and Industry)

2030                          2050

Transportation (marine transportation)

Target of cutting $CO_2$ emissions to half of 2018 levels by 2050 (International Maritime Organization)

LNG-fueled ships (Currently 175 ships, with the number expected to increase rapidly in future) → Ultra-high efficiency LNG-fueled ships and ammonia-fueled ships

Ultra-high efficiency LNG-fueled ships

LNG visualization cameras + AI image processing

Ammonia visualization cameras + AI image processing

Needs related to gas leak inspections to guarantee the safety of ammonia transport and storage

Electric power

$CO_2$ emissions are an issue for coal-fired power generation (38%)

Power generation from mixed burning of coal and ammonia (Began power generation demonstration project in 2021) → Fuel ammonia (or hydrogen carrier)

Ammonia gas turbine

Ammonia is a promising source of $CO_2$-free fuel, but it is poisonous so leaks must be detected

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The fifth example is the same gas monitoring solution, but we will introduce an example of new business deployment.

International Maritime Organization (IMO) has set a target of cutting CO₂ emissions to half of 2018 levels by 2050. To achieve this goal, they plan to rapidly increase the number of LNG-fueled ships that can significantly reduce CO₂ emissions in the future and convert them to ammonia-fueled ships in the further future.

On the other hand, it is essential for LNG and ammonia fueled ships to take countermeasures against accidents caused by invisible gas fuel leaks. To respond the issue, our gas monitoring cameras were adopted this year as safety monitoring for LNG-fueled ships, and gas monitoring has begun on LNG-fueled ships that are actually in operation.

Going forward, we will shift from coal-fueled to gas-fueled power generation not only by transport ships, but also in the electricity field, where they have entered the field of proof of concept. Therefore, we believe that the necessity for invisible gas monitoring will undoubtedly increase widely. We will expand the scope of our contributions by imaging IoT technologies to realize a carbon-free society.

The following is introduction of the status of our planetarium business, which is included in the same segment as "imaging-IoT solutions" business, even we are not able to provide a detailed explanation today.

The Planetarium business is a directly managed hall business, which consists of three halls: the MANTEN in Ikebukuro, TENKU in TOKYO SKY TREE TOWN and PLANETARIA TOKYO in Yurakucho. They have been visited by about 1 million customers a year before the COVID-19 pandemic. We will open two the LED self-luminous dome-shaped halls which are the first introduction in Japan. They will be operated directly by ourselves in this month and the beginning of FY2022, respectively.

We are also advancing digitizing innovations in the equipment and content business. B y the initiative, we provide projection equipment and video content to planetarium facilities, which are said to exist 2700 facilities worldwide. Through our connected dome strategy, we have proposed and launched the world's first DX of the planetarium, which enabled content distribution via the Internet and remote maintenance that had not been possible before. With this DX, local planetariums can also be expected to improve profitability by showing a variety of entertainment contents. And the introduction of our digital equipment is also being promoted.

In FY2021 H1, the directly managed hall business was extremely difficult due

to the declaration of the state of emergency because of COVID-19. However, we will rewind the project by opening a new directly managed hall which will open in FY2021 H2. From FY2022 onwards, we will aim to grow as a new source of profit through the innovation of visual expressions using LED domes and the proposal for DX conversion of planetarium.

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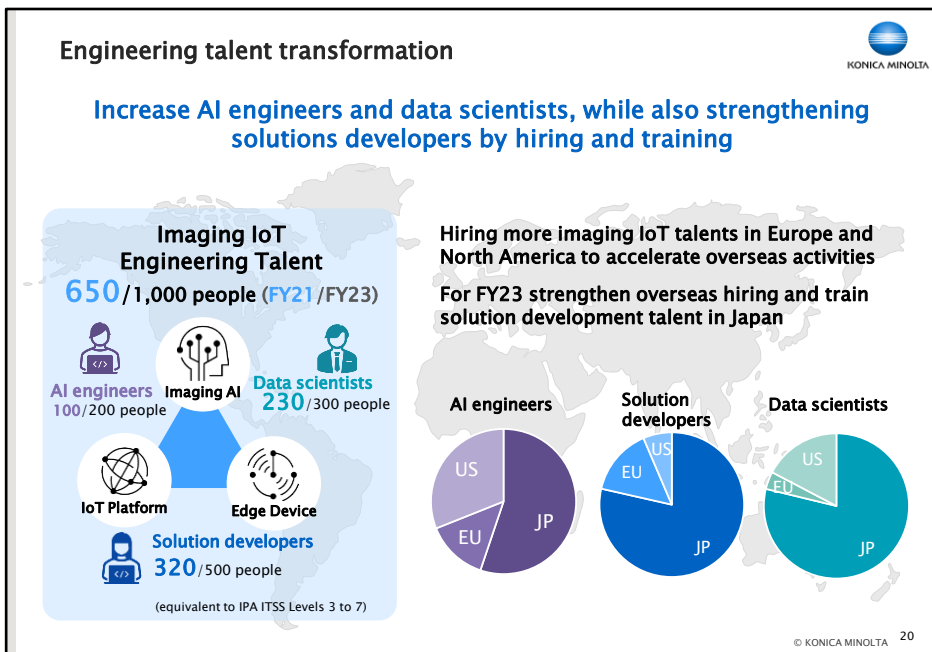
Finally, I will explain the state of human capital needed to grow imaging-IoT solutions business.
We develop intelligent image analysis services and to deploy efficient businesses using cloud technology and other technologies. To achieve it, we believe it is necessary to have "engineers specializing in imaging AI" and "data scientists," and "solution developers" who understand these technologies and develop optimal solutions. We are continually promoting training and strengthening recruitment.
Assuming the size of our business in 2025, we aim to increase the number of personnel required to 1000 by 2023. These three skills are defined as "imaging IoT talents." Currently, we have almost as many as 650 people as planned.
Imaging IoT talents are not human capital for this business alone, but are cooperating globally. We will utilize them as human capital that respond flexibly to develop imaging-IoT services in Konica Minolta Group.
Looking ahead, in line with the growth of related businesses in each region, we will strengthen our human capital in Europe and the U.S. through local recruitment. In Japan, we strengthen raising the talents of solution developers who can develop the project in cooperation with overseas talents.

The explanation of imaging-IoT solution business is completed. Thank you for your attention.