Konica Minolta Day

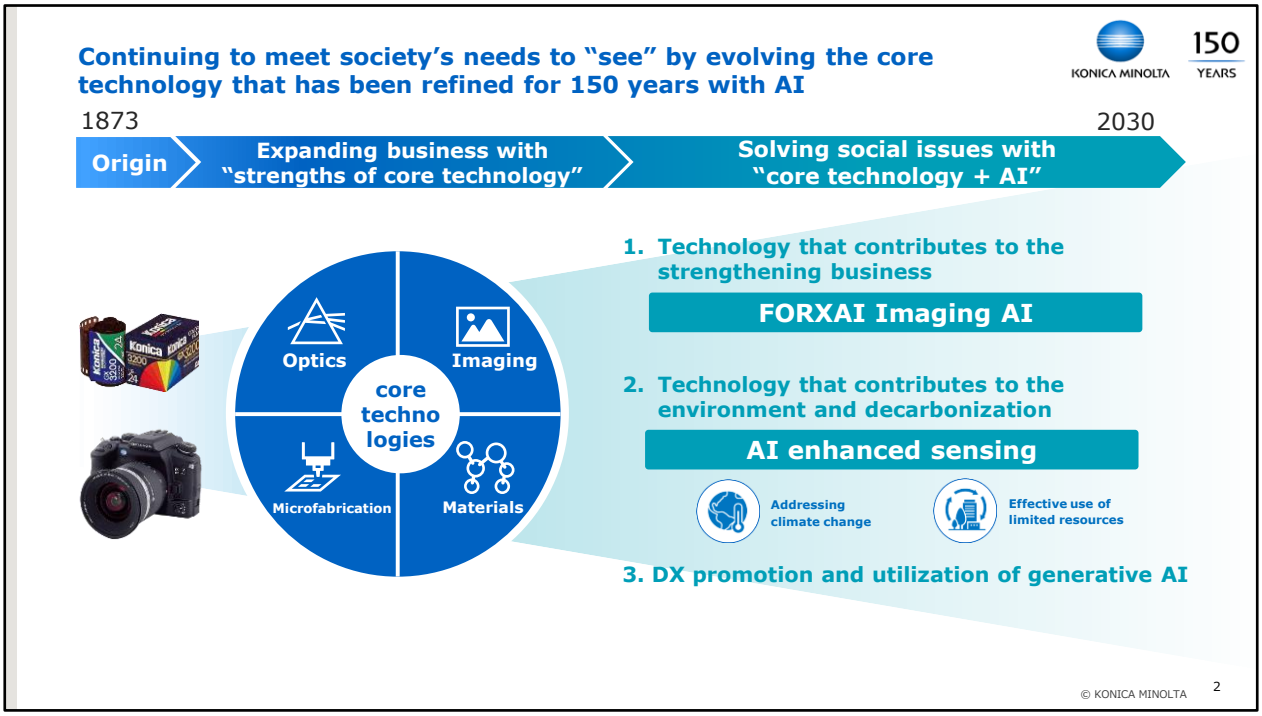
KONICA MINOLTA 150 YEARS

TECHNOLOGY

December 12, 2023
Toshiya Eguchi
Executive Vice President and Executive Officer

Giving Shape to Ideas

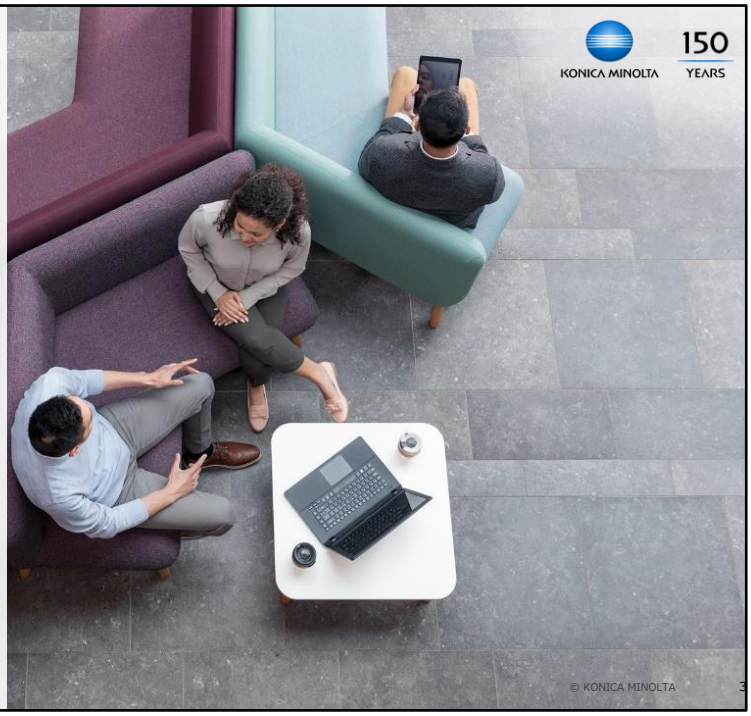
Hello, everyone.
My name is Toshiya Eguchi, and I am in charge of technology.
Now, I would like to talk about our view on technology.

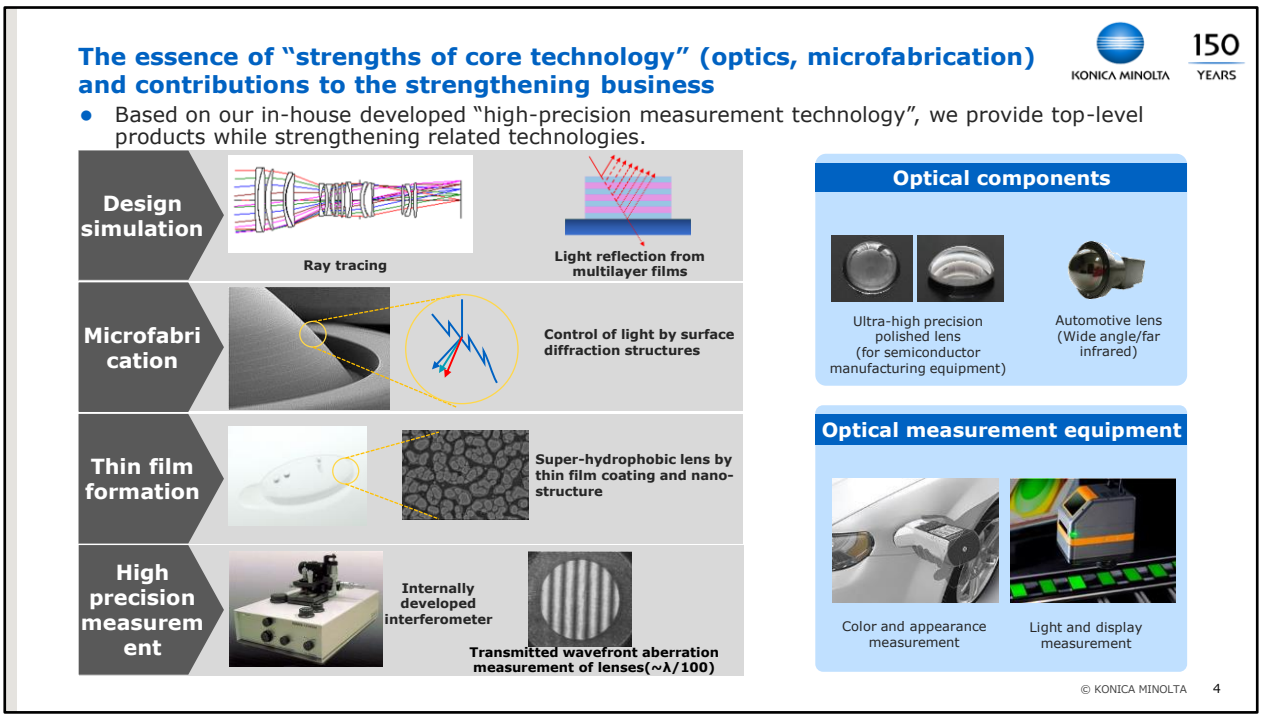


This year marks the 150th anniversary of Konica Minolta's founding. In drafting a new medium-term plan for technology, we would carefully look back over the past, thoroughly review and ascertain the essence of Konica Minolta's strengths of core technologies. At the same time, we would take advantage of our technological strengths in optics, microfabrication, materials, and imaging, each of which is a distinctive element of our business, taking into account how these technologies will benefit Konica Minolta in the future. We will then integrate AI into the technologies to meet the changing needs of the times and fully utilize them, leading to significant expansion of our business.
This is the fundamental view that has led us in moving forward.
I touch on the three points that we want to strengthen today.
Firstly, the strengthening business for our growth in the future. In this business, we aim to further expand the scope to grow our business by thoroughly leveraging the FORXAI Imaging AI, an imaging AI technology to increase added value.
Secondly, we have decided to develop technologies that respond to the environment and decarbonization with our desire to contribute to society and the world, although this is a preliminary step. AI-enhanced sensing is typical of such technologies, and we have begun to combine this sensing technology, which is one of our strengths, with Konica Minolta's unique AI technology in an effort to implement it in society as a technology for

reducing environmental impact.
Thirdly, to fully utilize these AI technologies in the company, we will promote DX in our internal operations and in collaborative creation with our customers, by drawing on human resources, the AI engineers and data scientists we have hired and trained over the past decade or so. This is what we need to do thoroughly. I also want to highlight how we will adopt generative AI, which has been gaining momentum since last year.

1. TECHNOLOGIES THAT CONTRIBUTE TO THE STRENGTHENING BUSINESSES





Now, let me explain the essence of how Konica Minolta's core technologies benefit the strengthening business.

First, optics and microfabrication technology. This is a group of technological elements in which we have strived for mastery through the production of high-precision lenses for cameras and CD pickup lenses, for which we held a large market share in the past.

The first is the design simulation technology to create ultra-high precision lenses, the second is the advanced microfabrication technology to realize the lenses, and another is the thin-film formation technology to achieve high added value. To date, these comprehensive technologies have increased the added value of various optical products, enabling us to continue to produce world-first products.

We believe that what lies behind this is our ability to develop evaluation technology in-house for manufacturing high-precision lenses, which is the essence of our strength.

Here you can see "Transmitted wavefront aberration measurement of lenses, λ/100," which is a numerical value to evaluate how precisely a lens can be polished. To be specific with the "λ/100," as mentioned here, when you want to design a lens the size of the Kanto Plain, the evaluation of how much convexity and concavity error you can allow is an evaluation technique that can capture as little as 5 mm.

We have pioneered the creation of these technologies and the technology

to evaluate them, and developed new advanced technologies and lenses. As such, in the optical components area, we offer high-precision lenses for the semiconductor industry, produce high-performance automotive lenses, and conduct both color and appearance measurement and light and display measurement that have become industry standards. These are the businesses we will continue to support.
Such technologies will be applicable to semiconductors, displays, and other new areas, and we hope to further enhance and expand them.

The next is materials technology, which is a group of technologies that we have accumulated in the process of producing films and copier toners and whose performance and functions we have gradually improved and mastered.

Our unique feature is the technology to form particles and properly disperse them in the material, which started in the film production process, and this has become our strength. Further, the compounds used in such technology that we are able to create with high purity, and as an imaging company, our asset is the vast library of materials, including luminescence and pigment materials.

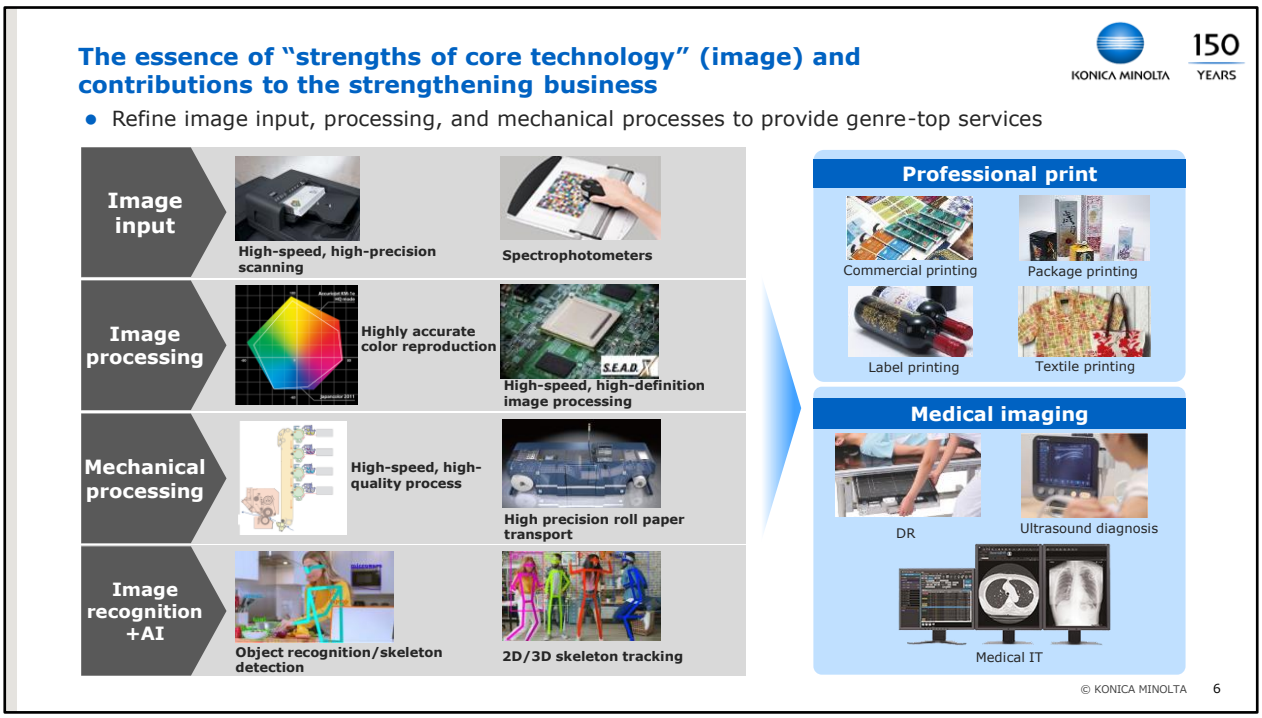
Another is the film-casting technology that we have developed in the film production process, a technology that a few companies in the world have. It enables us to pour a solution, stretch it, and produce an optically superior film.

When it comes to materials technology, our strength lies in composite and integrated technologies, which differentiates us from a company that sells materials and components. That is the essence of our strength.

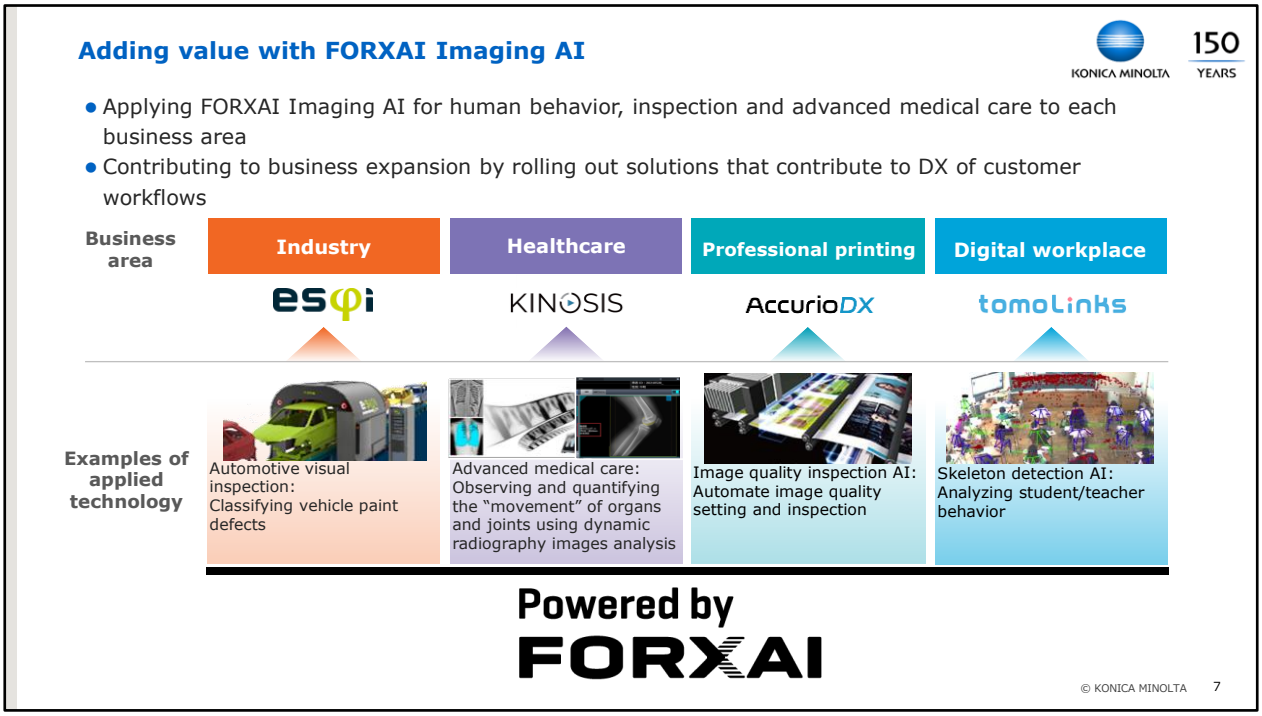
By applying precision analytical technology as the two pillars to support these processes, we can quickly and accurately create the desired materials. We believe that there is still a very broad range of applications.

We still continue to respond swiftly to what our customers want, such as environmentally friendly chemical toners and display materials. We see

the area as having many opportunities for the future.



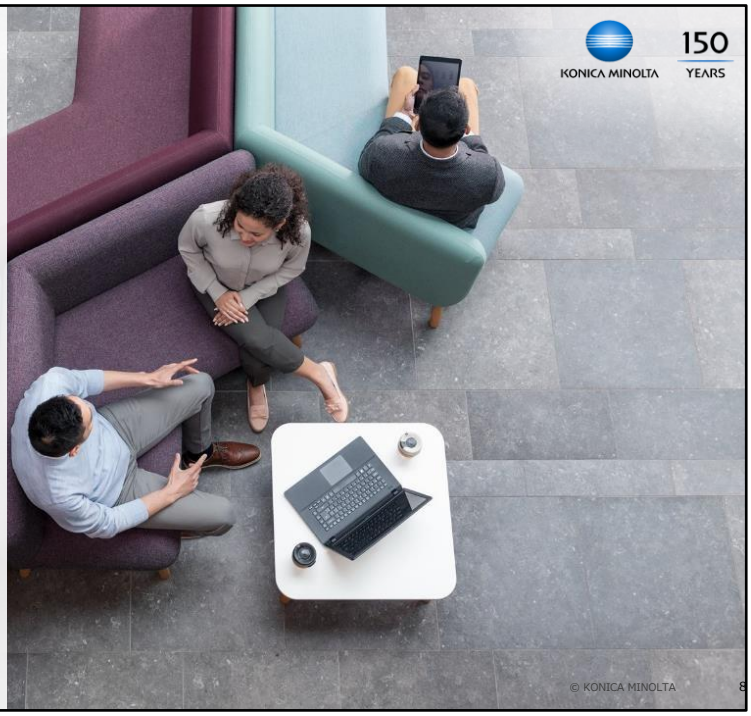
The next is image. Konica Minolta's specialty is the creation of images, e.g., photographs, copiers, medical equipment.
Input, processing and capture, and mechanical processing are always combined in a trinity to create the image. If any one of these were missing in the technologies, we would not be able to produce our image or color.
All of these were digitalized along the way, so image recognition is also our imaging AI technology that was built on this kind of past experience and know-how, which is different from the basis of today's general AI image recognition. We thus consider the scope of what we can do to be very broad.
Now that we have acquired such imaging AI technology, I believe that in our existing professional print and medical imaging businesses, we are transforming into a company that not only sells devices and modalities, but also can continue to build genre-top services on top of the existing ones to enhance added value.



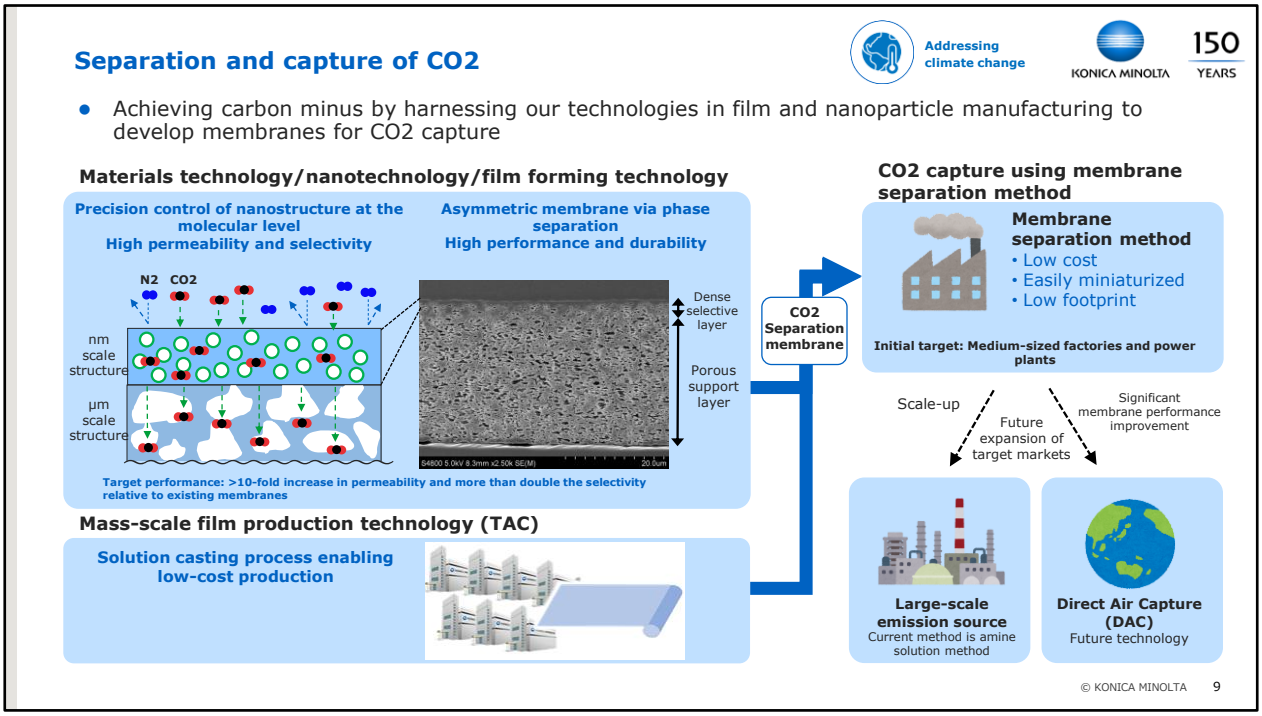
This imaging AI technology is a strength of the entire company, and our strengths lie in the areas of human behavior, inspection, and advanced medical care, and these are the areas we have focused on and strived for mastery in the imaging AI technology.
For this reason, we have created an environment in which the company's original algorithm is made available as an API in each business, in order to quickly deploy solutions that can stick and contribute to our customers' workflows. This is the idea behind Powered by FORXAI, and we are in the process of deploying this imaging API in all of our businesses.
For example, Eines's automotive visual inspection in the Industry Business can detect small paint stains and scratches that skilled inspectors would be able to identify using deep learning-based image recognition. Similarly, in healthcare, it is now possible to aid diagnosis by quantifying and evaluating the movement of organs and joints through dynamic analysis based on the inspection of moving images. In professional printing, what used to be done by expert print operators adjusting image quality with their professional eyes can now be done with the eyes of AI and image recognition. In education, it is now also possible to analyze the behavior of teachers and students.
We intend to continue applying the FORXAI technology to all of our businesses, and thereby accelerating our efforts to rapidly create innovative solutions. In doing so, we will advance the technology to the

extent that it contributes to the growth of our businesses.

2. TECHNOLOGY THAT CONTRIBUTES TO THE ENVIRONMENT AND DECARBONIZATION

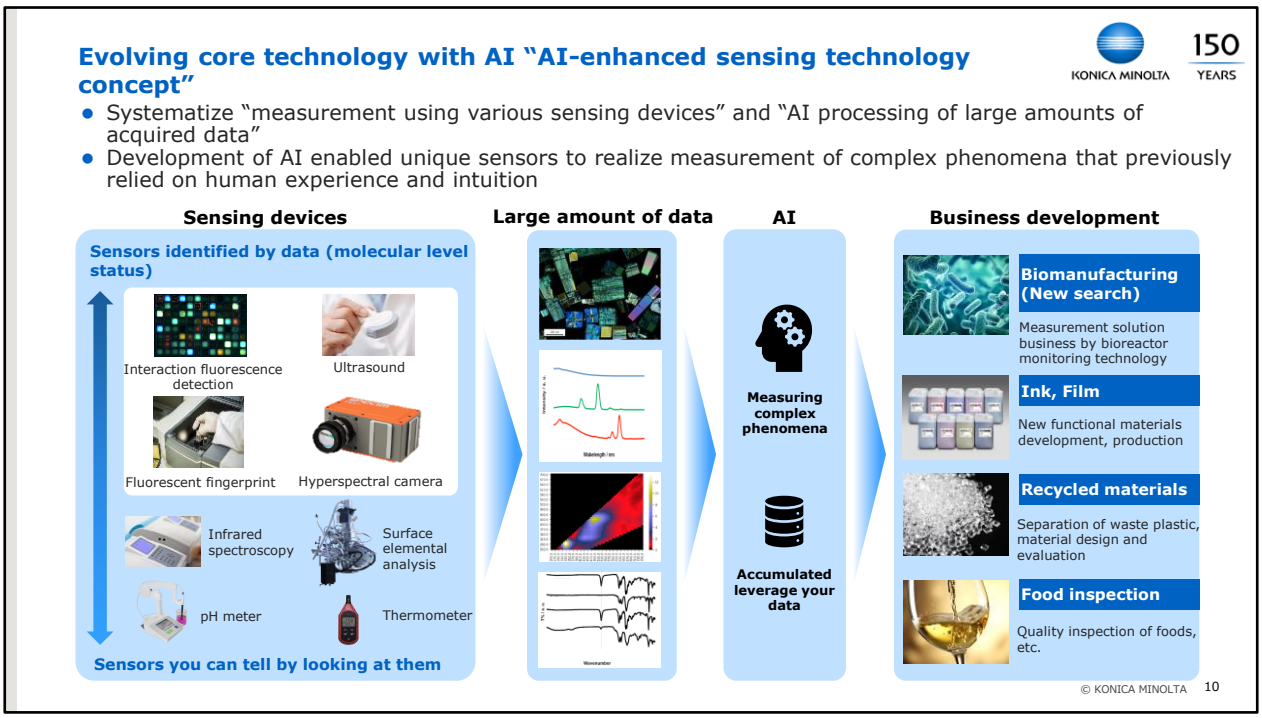


Next, let’s move on to technology for the future, which relates to the environment and decarbonization.



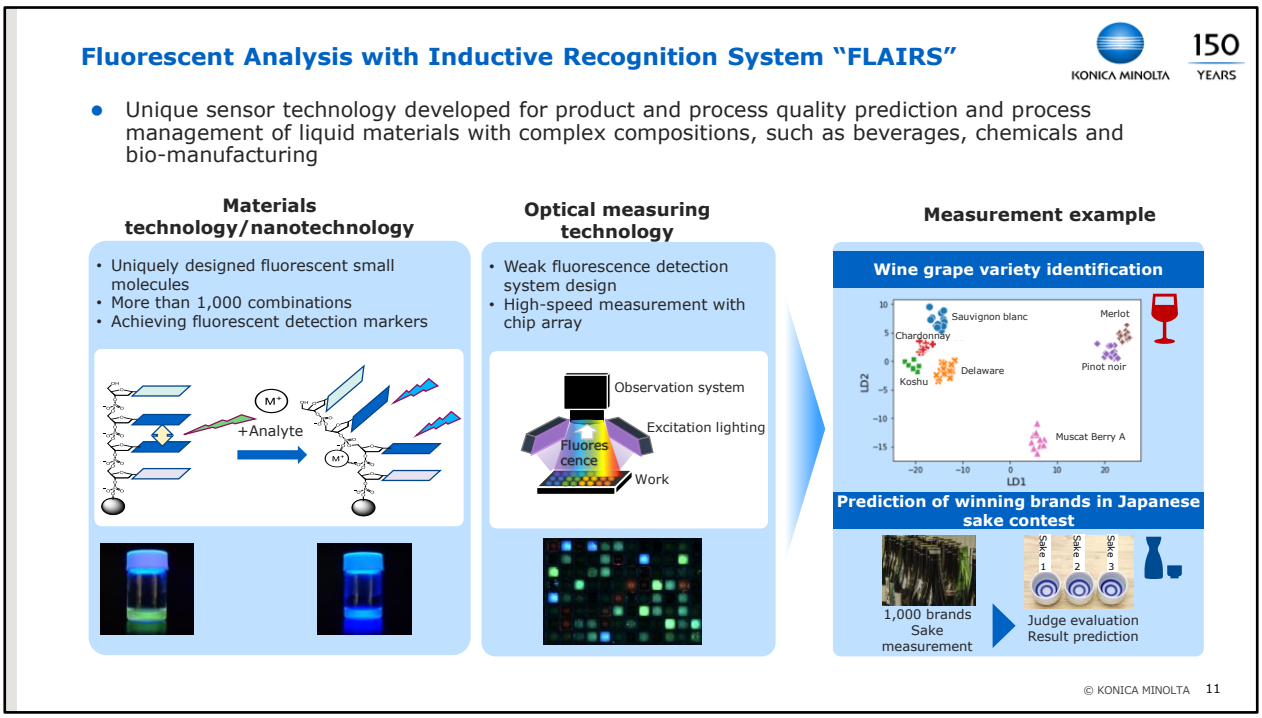
First, let me start with the technology of CO_2 separation and capture.
As mentioned in the environment part, the global environment has become increasingly severe and extremely abnormal.
We anticipate that the technology of not only reducing CO_2 emissions but also capturing CO_2 will become important in the future. Although there exists a variety of CO_2 capture methods , the technology that captures CO_2 by passing it through a membrane called "separation membrane" is expected to be the most energy-efficient and cost-effective, but the world's technology has not yet caught up with this technology. This is the challenge we are taking on. We do have the technology and a factory to produce films. For example, TAC films fundamentally have the performance of separating CO_2. Besides them, as shown in the picture on the left, we also have the technology to create both dense and sparse porous layers, so when we build such a structure, CO_2 is selectively separated and permeated and absorbed in the porous layers. We expect that if we can control such process the way we want, we will be able to produce the things that are expected by the market. And in fact, at the laboratory level, we have confirmed the potential to achieve the market's expected level of performance.
In the future, we will supply modules made from films that can be used in medium-sized factories, power plants, and other places that emit large amounts of CO_2, as they are becoming a management issue. By expanding

the business to larger scale and other areas, we will take on this challenge as both a great business opportunity and a chance to contribute to society.



Further, the world is now overflowing with manufacturing using fossil-derived materials, as well as plastics and other fossil-derived products. Bio-manufacturing is the process of manufacturing products using non-fossil derived or biological materials. It is considered to be the key to addressing global environmental issues, and I want to talk about Konica Minolta's unique concept of AI-enhanced sensing technology to support this endeavor.

Most conventional measuring instruments, such as pH meters, thermometers, and elemental analysis, for example, as shown in the lower left of the image, are designed to narrow down and measure how much of a certain thing there is and what kind of condition it is in. With AI technology now so advanced, it is now possible to see what the object is, for example, whether a plant is healthy or not, by collecting a large number of sensors and processing the data that comes out of them with AI. This means that we can now use the data to determine the state of the object down to the molecular level of its contents. As explained in the first half of the session, a hyperspectral camera can sort out the material of plastic resin. This would suggest that the data is collected and deduced by breaking down the wavelengths. In the same way, we have come to understand that collecting a series of sensors can do this.



We develop Konica Minolta's original sensors.
We have worked on our original sensor called the "Fluorescence Analysis with Inductive Recognition System," or FLAIRS. For example, FLAIRS can analyze the movement of microorganisms in beverages, chemicals, and bio-manufacturing and check the status of products and manufacturing processes that handle liquids with complex compositions in near real time, all at once. Instead of taking measurements that would take a week with traditional analyzers, we are able to understand them on the spot. We are developing in pursuit of such a thing.
Let me give you an idea of what it looks like. The far-left image shows a chain with four wings attached. We designed a number of fluorescent small molecules in this shape, each with a unique feature. When the target analyte acts on these small molecules, the shape of the chain changes, and the fluorescent part of the molecule changes the way it glows. In other words, it is a marker that by looking at the way it glows, we can see what is happening at the molecular level. For example, to study the state of a liquid, we can make many markers that are sensitive to trace amounts of inorganic ions, sugars, or proteins in food, or molecules of flavorings to measure taste. When the markers are arranged in an array like the image in the center, when an object is acted on there, the markers change into different patterns depending on the state of the object and the content of the substance. This is the FLAIRS sensor that can capture them

in an instant.
Then, to see what kind of things the FLAIRS could be used for, we tried it out. For example, we tested it with wine and sake, which can only be reliable through human's sensory evaluation. we wanted to classify wine, so we tested to see whether it could distinguish different grape varieties, and it proved to be able to identify them perfectly. For sake, we also tested 1,000 varieties of sake. We wanted to see if it could identify the sake that won a gold medal at a sake competition, and it was able to identify it.
This is exactly the kind of technology that can classify materials even though humans do not understand what is in them. We came to believe that this was a technology that had the potential to revolutionize the manufacturing process of food and chemical products.

"Bio-manufacturing" using non-petrified raw materials

Using limited resources effectively

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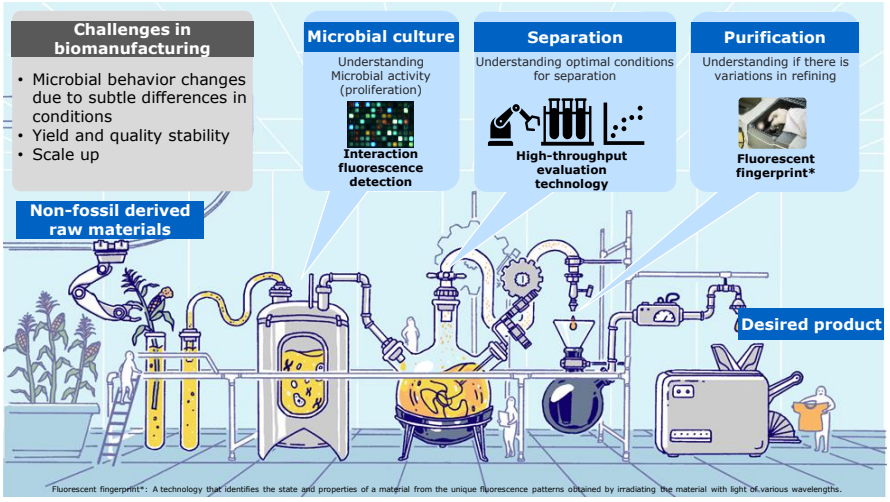
- Established Konica Minolta-AIST Bioprocess Technology Cooperative Research Laboratory (June 2023)
- Aiming for social implementation of next-generation manufacturing process monitoring for "bio-manufacturing"



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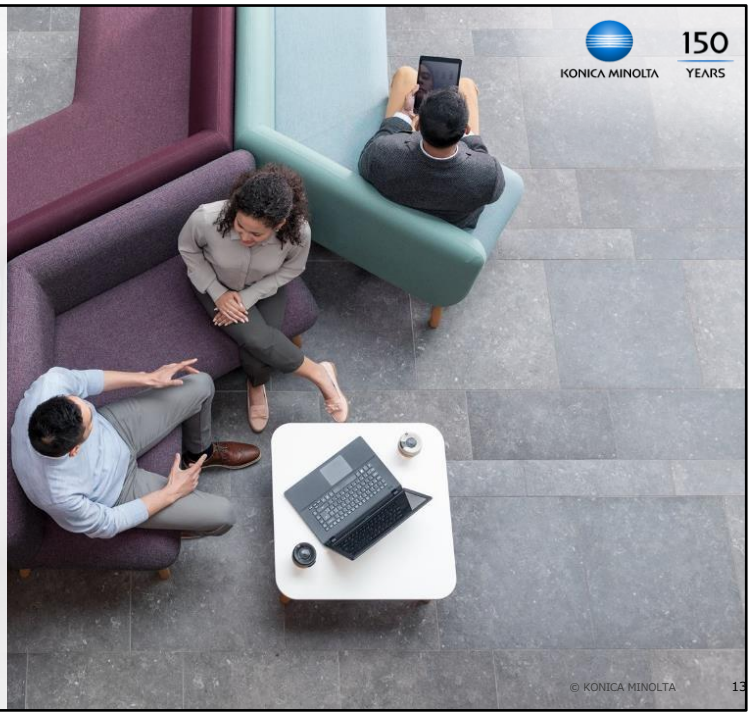
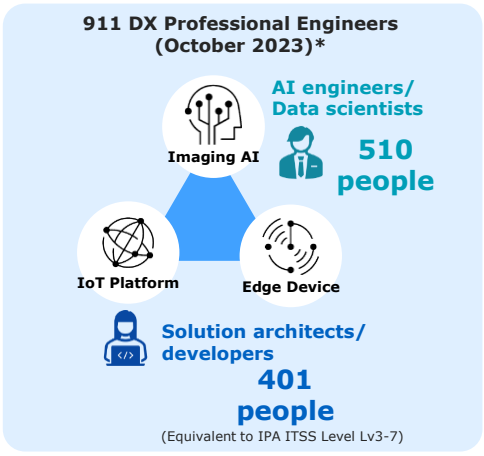
We are currently exploring the possibility of applying this technology to the bio-manufacturing of non-fossil derived raw materials.
It was the National Institute of Advanced Industrial Science and Technology (AIST) that drew their attention to our FLAIRS technology.
AIST was an early proponent of bio-manufacturing research. The challenges of bio-manufacturing are that the yield and quality are unstable because of subtle differences in conditions, since it uses microorganisms.
This means that although it can be done at the laboratory level, it has the barrier of not being able to be scaled up and mass-produced. By adding such sensing technology to the basic process of bio-manufacturing, i.e., microbial culture, separation, and purification as described here, Konica Minolta aims to systematize the process and apply it to various bio-manufacturing applications. In this way, we hope to contribute to reducing the environmental impact on society. This is the leading research and development project that we are pursuing.

3. DX PROMOTION AND UTILIZATION OF GENERATIVE AI

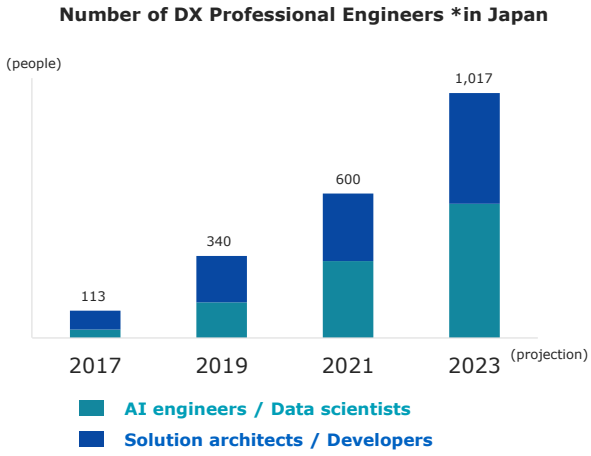


DX Professional Engineers (Imaging IoT Engineers)

- Strengthen AI engineers, data scientists, and solution architects/developers by training and hiring. Aiming to have 1,000 engineers by the end of FY23.



*Number of standard and expert certifiers.
1,831 people including entry certifiers.



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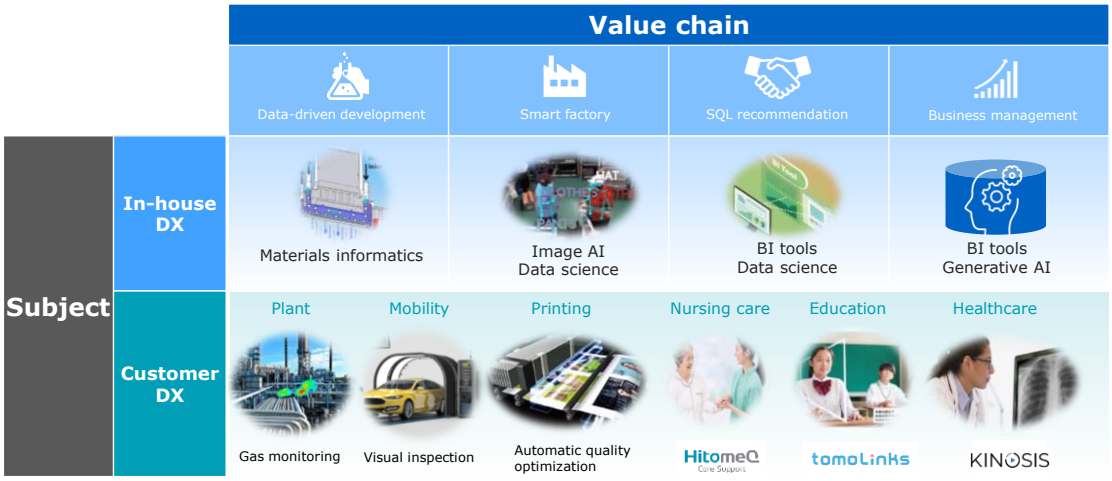
To grow our business using such AI technologies and data science, we need human resources.
This is what we have been working on for the past 10 years or so.
We increased the talents such as, AI engineers, data scientists, and solution architects who are familiar with the AI and data science by recruiting them, upgrading internal training systems,.
As planned, we are on track to nearly reach our goal of more than 1,000 engineers by the end of 2023.
They can be found in all departments, including production, human resources, general affairs and accounting, as well as R&D.
Now that we have reached this milestone, we are ready to fully expand our DX initiatives.

In-house and Customer DX initiatives

- We have placed DX specialists in all departments throughout the company to promote data utilization.
- DX specialist engineers and field members worked together on approximately 300 DX themes in two years.



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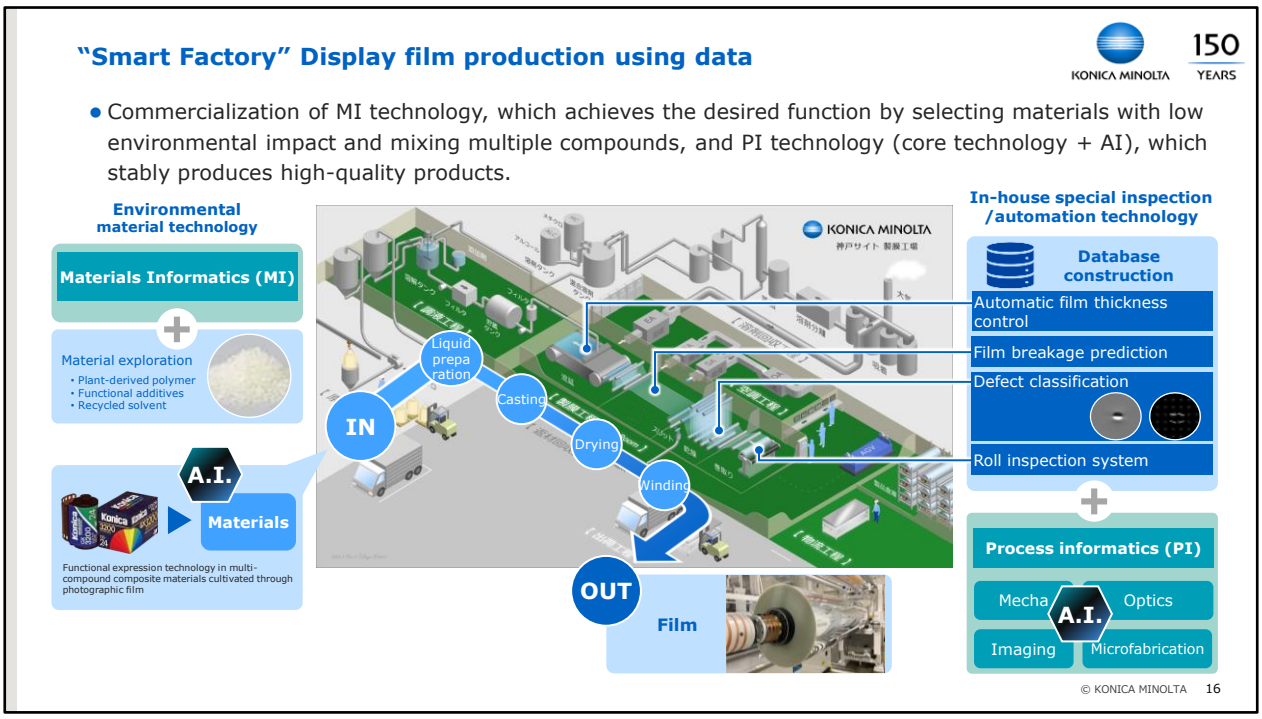
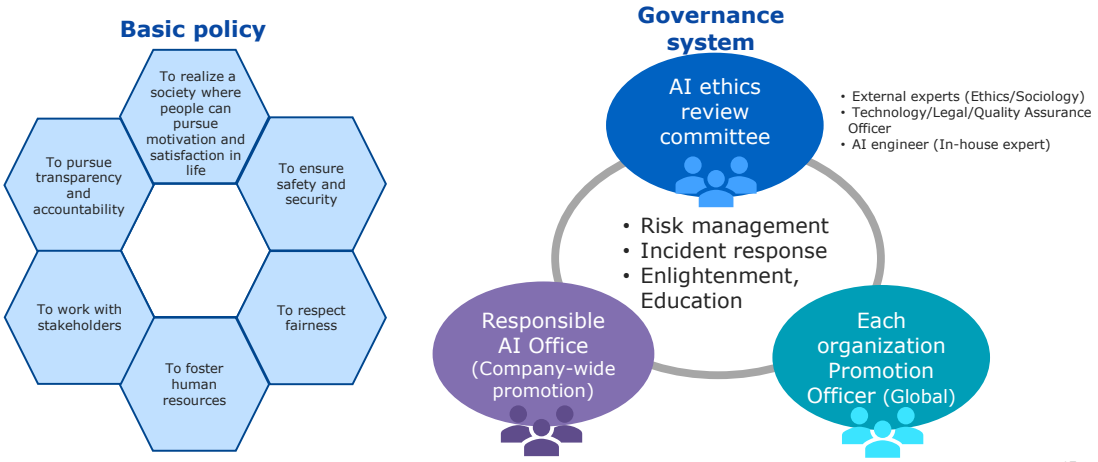
As explained in the first half of the session, it was about three years ago that these specialist engineers and field members started to form a team to work together.
In doing so, 300 in-house DX themes were implemented over the past two years, and produced positive results.
The results include production efficiency, sales efficiency, and accounting management, as well as a major shift to a data-driven development process, among many other situations.
Of course, even in customer DX themes, data from FORXAI-based solutions will be utilized to build new services on top of existing ones.
We came to realize that things like this are starting to happen now.



One example of a thoroughgoing process is the smart factory.
This is a production process for display films. The entire process, from development to production to inspection, uses DX.
In the development stage, the compounds we are looking for and the combination of these compounds are not randomly experimented with, but rather, the development period can be significantly shortened by using materials informatics technology.
In the production site, by combining various sensors, film thickness can be automatically controlled, and film breakage, which used to occur from time to time, can be predicted and prevented from occurring. This has a tremendous effect on business.
Feedback based on results of the final inspection is fed back to the upstream process to improve the process. We believe that the outcome of advancing DX across the entire company has made this business stronger.

Initiatives for governance on AI usage

- June 2021: Established basic policy on the use of AI
- December 2021: Established AI governance system (AI Ethics Review Committee, regulations on the use of AI)
- May 2023: Established internal guidelines for the use of generated AI
  80 risk assessments conducted, approximately 10,000 employees trained



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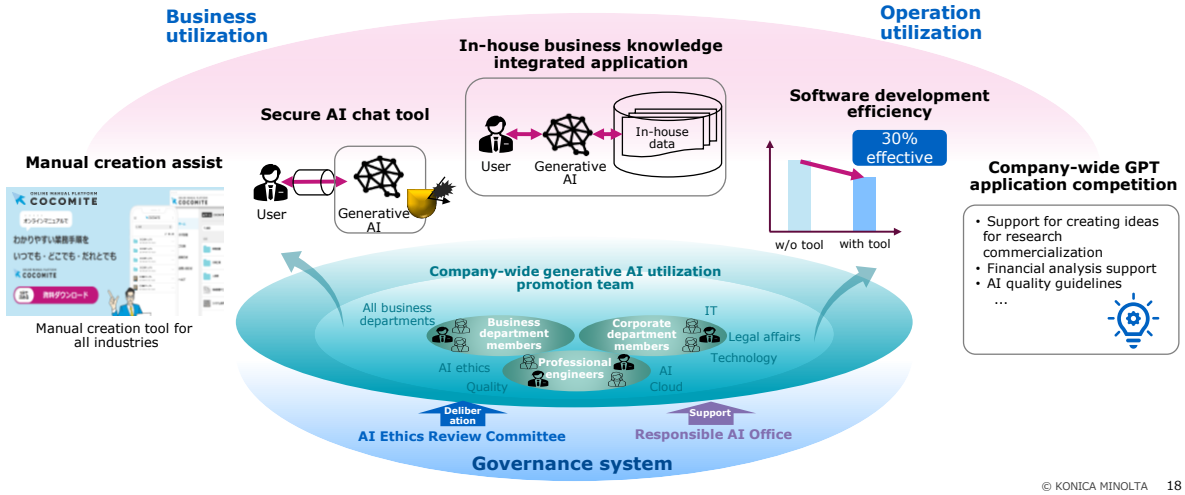
I'd now like to talk about the use of AI.
We all know from experience that the use of AI can create a lot of value, but at the same time it comes with various risks.
Among such risks are lawsuits and human rights issues. Therefore, in 2021, we established a basic policy for the use of AI, set up the AI Ethics Review Committee composed of members including external experts, and established a governance system led by the committee.
Since its launch in 2021, the committee has conducted 80 risk assessments to date, and 10,000 employees have completed the training program to convey the results.
On this basis, we have been able to steer the company in the direction of actively utilizing AI.

Flexible promotion of generative AI utilization, supported by the governance system

- Established company-wide generative AI utilization team. With the help of generative AI usage platform and business-specific tools, provided support for utilization of latest GPT to accelerate internal and external business.



Generative AI has begun to be adopted in internal business operations at a very fast pace.
With the governance system in place, a secure environment built in the workplace, and technical support and other consultations made available, departments have started to develop integrated business applications using the company data, and the efficiency of software development improved by 30%.
Commercial software known as “Manual Creation Assist” and services incorporating generative AI have become commercially available this summer.
It is our technology policy to actively utilize AI and incorporate generative AI into operations, and as I mentioned at the beginning, to ascertain the core technologies, which are Konica Minolta’s strengths, and work to strengthen our business that takes advantage of these strengths.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YEARS

Appendix

Glossary

●FORXAI Imaging AI
Part of our imaging IoT platform FORXAI, consists of high-speed, high-precision AI processing technologies mainly for images.

● esφi
EINES' tunnel-type paint defect inspection system, which has been installed by multiple European and American automobile companies.

● X-ray dynamic analysis/KINOSIS
KINOSIS is an x-ray dynamic analysis workstation, which enables more detailed diagnosis by continuously taking X-ray images to observe the movement of the affected area.

● AccurioDX
A co-creation platform that revolutionizes communication between people and companies through digital printing.

● tomoLinks
Educational support services that utilize ICT to understand the characteristics of each student and realize optimal learning.

● Imaging IoT engineers
Engineers with the skills to analyze image data and various sensor information using AI technology such as deep learning to support decision-making and judgment in various workplaces.

