What Is Our Long-term Growth Strategy?

Our Long-term Vision is to become "a company that provides Next-generation Social Infrastructure essential for development of a digital society." This section provides an overall picture of this vision and the various technological initiatives to achieve this in a manner that is easy to understand for non-engineer readers.

Long-term Vision

“Provide Next-generation Social Infrastructure essential for development of a digital society”

Challenges in realizing a “society that coexists with AI”

Since the release of the interactive AI-powered *ChatGPT* in November 2022, generative AI has increasingly spread. We predict the arrival of a “society that coexists with AI” in which AI will be incorporated into various products and services, enabling people to enjoy convenient and comfortable lifestyles.

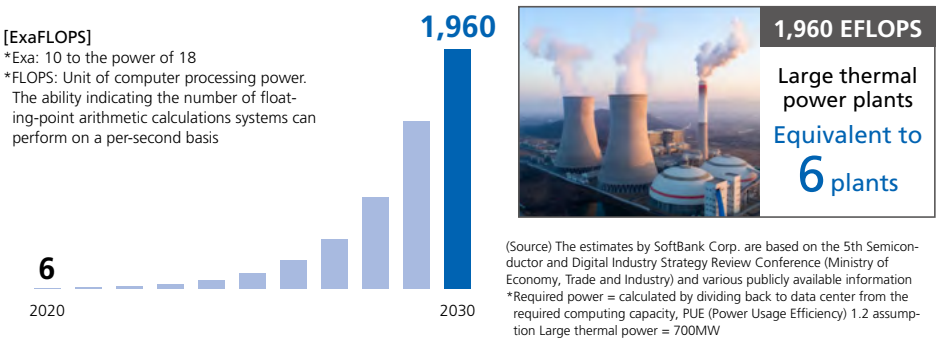
Meanwhile, the use of AI requires significant data processing and power consumption at data centers. The graph on the right shows the outlook for data processing demand in Japan. Against the backdrop of the spread of generative AI, we expect that by 2030, there will be more than 300 times as much data processing as in 2020, with a corresponding enormous demand for power. To achieve a “society that coexists with AI” and is also sustainable going forward, this demand for power must be met by renewable energy sources that do not emit greenhouse gases. In addition, data centers that process the vast amount of data pertaining to the use of AI are currently concentrated in Tokyo and Osaka. If the number of data centers continues to increase as the use of AI expands in the future, the demand for power will be strained, which could lead to large-scale power outages.

Providing solutions through building “Next-generation Social Infrastructure”

To address these issues, in May 2023, we announced our Long-term Vision of becoming “a company that provides Next-generation Social Infrastructure essential for the development of a digital society.” This Long-term Vision includes the construction of sustainable, distributed AI data centers where renewable energy generated in each region will be consumed in each regional data center. Through these efforts, we aim to become an essential part of a “society that coexists with AI,” thereby realizing a sustainable society and enhancing our corporate value.

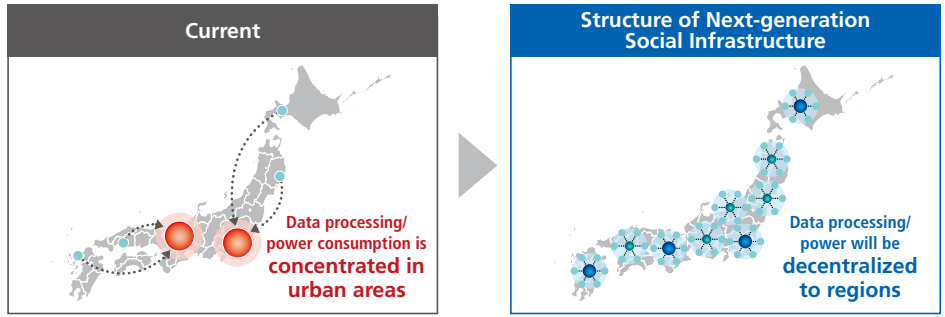
(Please refer to P22 for an overview of “Next-generation Social Infrastructure” and our technology strategy for its realization.)

Demand for data processing and power requirements in Japan

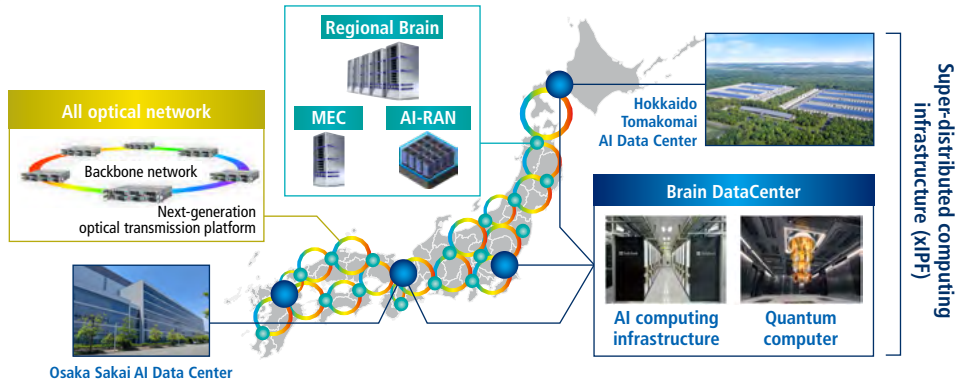


(Source) The estimates by SoftBank Corp. are based on the 5th Semiconductor and Digital Industry Strategy Review Conference (Ministry of Economy, Trade and Industry) and various publicly available information
*Required power = calculated by dividing back to data center from the required computing capacity, PUE (Power Usage Efficiency) 1.2 assumption Large thermal power = 700MW

Issues in the current infrastructure



“Next-generation Social Infrastructure” that we aim to build



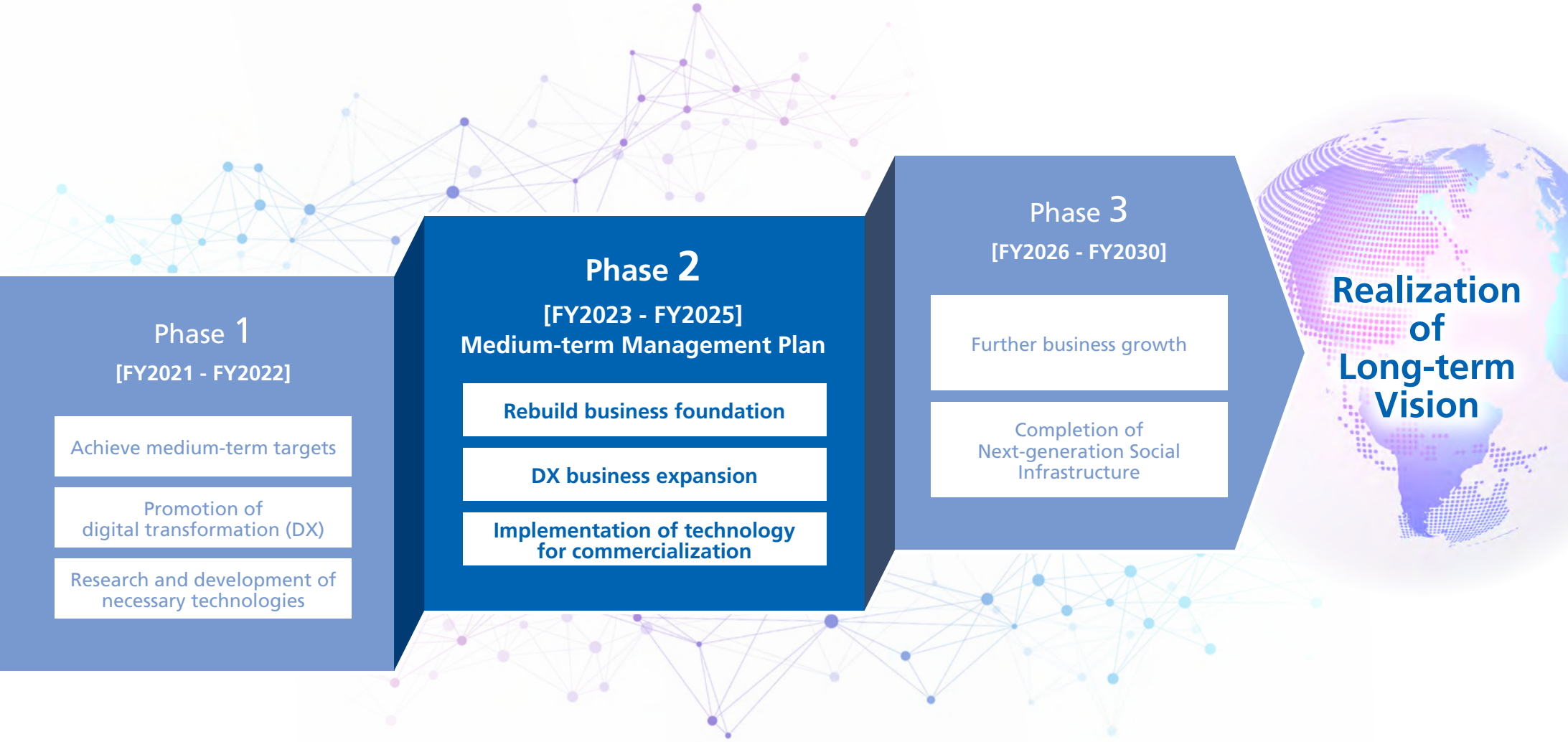
Roadmap to realizing the Long-term Vision

To achieve this Long-term Vision, we are promoting initiatives by dividing the 10-year period into three phases as shown in the figure below.

In the first phase, we worked on various technological developments in parallel with our initiatives to achieve our medium-term management targets and to promote our DX business. During this period, we identified the fundamental technologies needed for Next-generation Social Infrastructure and strengthened our structure by establishing a new advanced technology research laboratory.

We positioned the second phase as the period for focusing on the Mid-term Plan. During this phase we are rebuilding the business foundation affected by the mobile service price reductions, while expanding the DX business and implementing technologies aimed at developing the Next-generation Social Infrastructure into a business.

Finally, in the third phase, we will further grow our business and complete the Next-generation Social Infrastructure in order to achieve our Long-term Vision and sustainable growth.



Technology Strategy for Realizing "Next-generation Social Infrastructure"

Advancing research and development to realize the "Next-generation Social Infrastructure" supporting a "society that coexists with AI"

We predict the arrival of a society that coexists with AI in which AI will be incorporated into various products and services, enabling people to enjoy convenient and comfortable lifestyles. Meanwhile, the use of AI requires significant data processing and power consumption. This section presents an overview of the technology strategy we are pursuing and its progress toward realizing the "Next-generation Social Infrastructure" that will address these issues and enhance our corporate value.

Overall picture of "Next-generation Social Infrastructure"

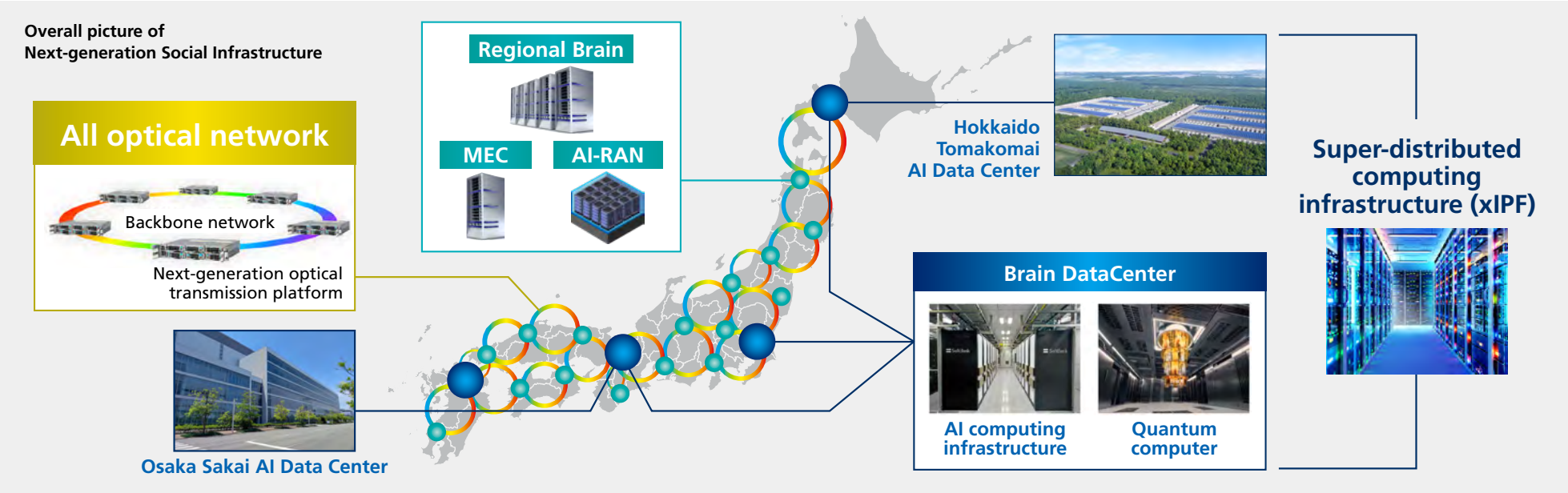
To meet the significant data processing demands generated by AI, the large-scale data center "Brain DataCenter" (P23) and the medium-scale data center "Regional Brain" will be distributed and deployed. The "Brain DataCenter" will be equipped with an AI computing infrastructure (P25) and quantum computers (P24). We intend for these data centers to be "locally produced for locally consumed" sustainable data centers (green data centers) where renewable energy generated in each region will be consumed in each regional data center.

By incorporating NVIDIA's cutting-edge superchip into our mobile service base stations, we will achieve both efficient deployment of "MEC*1" and "AI-RAN*2" (P29).

In addition, we plan to introduce a "super-distributed computing infrastructure" (P23) that will run physically distributed data centers in different regions in parallel, virtually operating as a single data center.

We have already deployed the nationwide "all optical network" (P24), a power-efficient, low-latency, high-capacity network that connects distributed data centers.

We have expertise in data centers and telecommunication networks that we have cultivated, human resources who have been involved in the development of generative AI, and security-related know-how that we have accumulated in operating telecommunications infrastructure. By further developing these resources, we will build a "Next-generation Social Infrastructure" and enhance our corporate value over the medium- to long-term.



*1 MEC: abbreviation for Multi-access Edge Computing. Computing infrastructure installed near devices requiring real-time processing, such as autonomous cars and robotics
*2 AI-RAN: a radio access network (RAN) consisting of antenna equipment and base stations integrated with AI processing infrastructure

Technology Strategy for Realizing "Next-generation Social Infrastructure"

Construction of "Hokkaido Tomakomai AI Data Center"

In November 2023, SoftBank announced the construction of the "Hokkaido Tomakomai AI Data Center," which will be one of the "Brain DataCenter" facilities. The data center plans to maximize the use of renewable energy from within Hokkaido Prefecture, making it a model case of a "locally produced for locally consumed" green data center. We are aiming to complete the first phase of construction of the data center and commence operations in FY2026, with an expected scale of 50 megawatts at the time of opening. The total project cost is expected to be approximately ¥65 billion, with up to ¥30 billion to be covered by subsidies from Japan's Ministry of Economy, Trade and Industry.

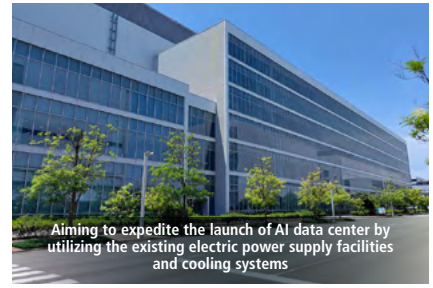
In addition to being used for in-house generative AI development and other AI-related projects, the data center will also be made available to a wide range of universities, research institutes, and companies to meet the growing need for AI-related usage.

In the future, we plan to expand the capacity of the data center to a maximum of 300 megawatts, making it one of the largest data centers in Japan.

Construction of "Osaka Sakai AI Data Center"

In March 2025, we acquired from Sharp Corporation the land, buildings, and other facilities related to its LCD panel plant in Sakai City, Osaka Prefecture for approximately ¥100 billion to construct a large-scale AI data center. By taking over the plant's land, buildings, electric power supply facilities, and cooling systems, we aim to expedite the construction and begin operations of an AI data center with a power capacity of approximately 150 megawatts in 2026. In the future, we plan to expand the capacity to over 250 megawatts.

In addition to utilizing this AI data center for the development of generative AI and other AI-related businesses, we will offer it to a wide range of universities, research institutions, and companies to meet various external needs. We will also create a model case for an industrial hub centered on the AI data center, aiming to solve problems and advance various industries, including primary industries, by leveraging AI. Furthermore, as a data center with a low environmental impact, we will also promote carbon neutrality.

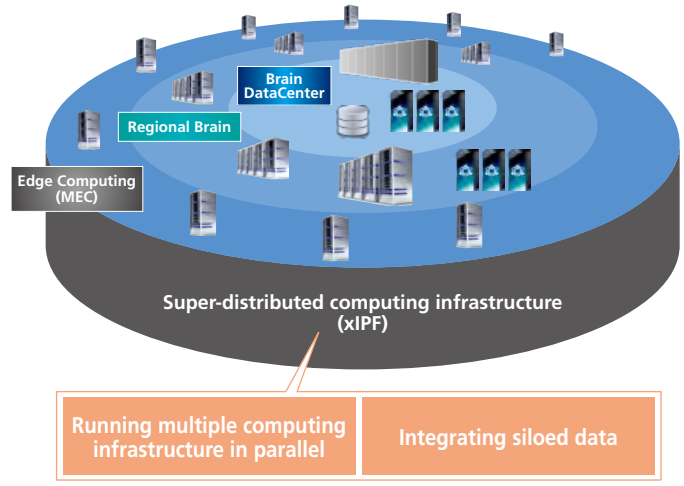


Development of "super-distributed computing infrastructure"

SoftBank is currently advancing research and development on a "super-distributed computing infrastructure." This platform allows data centers distributed across various regions, including Hokkaido, to operate virtually as a single data center. This eliminates the isolation of data within each data center (commonly referred to as "silo"), thereby enhancing convenience. It also reduces the risk of important data being corrupted or lost in the event of damage to a data center caused by a natural disaster or other incidents.

The platform is also anticipated to integrate data from IoT devices, sensors, and other instruments, in addition to data held by companies, governments, municipalities, universities, and other institutions. By handling this information in an integrated manner on the platform, we believe that it will lead to overall optimization of society through DX. We anticipate this platform to be widely adopted given that integrating vast amounts of data is crucial for applications such as autonomous cars and smart cities, as well as simulations in various fields such as road construction, urban planning, and disaster prevention. Additionally, we plan to offer in-house developed cloud services featuring AI capabilities (e.g., generative AI, quantum computing functions) on this platform for enterprise customers. Through these services, we expect to generate revenue opportunities such as flat-rate subscription fees for platform usage and pay-per-use API (Application Programming Interface) usage fees.

Integration and equalization of data processing nationwide toward overall optimization of society through DX



Research and development on a "quantum/supercomputer collaborative platform"

In the future, we envision integrating quantum computers into our "Brain DataCenter" to meet the significant data processing demands associated with the implementation of autonomous cars and smart cities, as well as various simulations, as previously mentioned.

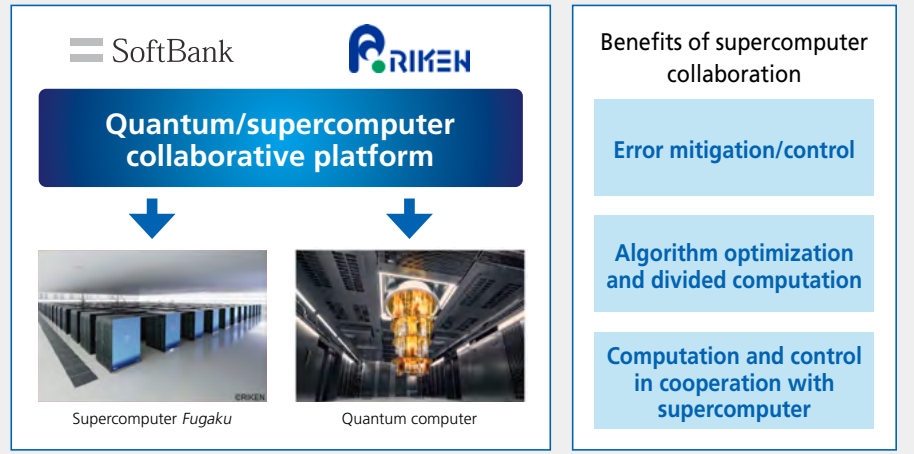
By applying quantum mechanics, quantum computers can perform more advanced calculations in a shorter period of time than conventional computers, which is why they are of great interest to us.

At present, however, running a quantum computer by itself faces numerous technical challenges, including scaling up and ensuring computational accuracy. For this reason, utilizing quantum computers in combination with supercomputers to expedite practical use is considered a promising approach.

As the first step in our research and development on a "quantum/supercomputer collaborative platform," we are developing software that will link quantum computers and supercomputers. After that, we will build platforms and develop applications to operate various quantum computers and supercomputers in combination. Through these efforts, we will work to accelerate the practical application of quantum computers.

This research and development is being conducted in collaboration with RIKEN, which developed Fugaku, one of the world's most powerful supercomputers. The project was also selected as a development theme publicly solicited by Japan's Ministry of Economy, Trade and Industry and the New Energy and Industrial Technology Development Organization (NEDO), who are covering all necessary expenses related to research and development as a contract project.

Development of "quantum/supercomputer collaborative platform"



Nationwide deployment of "all optical network"

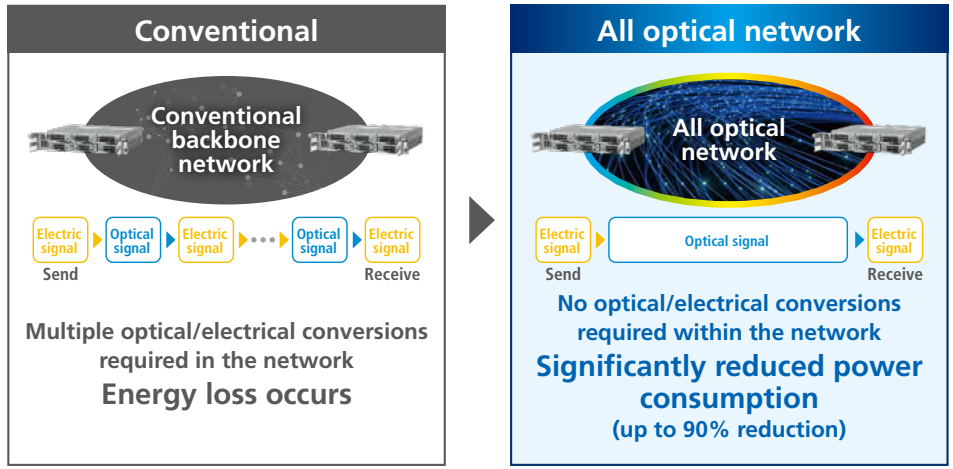
In October 2023, we completed the nationwide deployment of an "all optical network" in core areas of Japan. This deployment has not only significantly increased the capacity of the nationwide transmission network to handle huge amounts of data, but also transformed it into a power-efficient, low-latency network.

The greatest feature of this network is that by using optical technology, power consumption has been reduced to one-tenth of that of conventional networks. Here is a brief overview of how it works.

In a conventional network, data has to pass through multiple routers to get from the sender to the receiver. During this process, optical and electrical signals are converted multiple times, resulting in a large amount of energy loss. However, the "all optical network" enables communication with no conversion from optical signals to electrical signals in the network, resulting in a significant reduction in power consumption.

The practical deployment of this network has made it possible to reduce power consumption, electricity fees, and other costs while meeting the growing demand for data communications through "Beyond 5G/6G" and "Next-generation Social Infrastructure."

Features of the all optical network



Interview with Head of Homegrown Generative AI Development

Sovereign AI as a growth driver: How the development of homegrown LLMs will drive SoftBank's next leap forward

SoftBank is leveraging the full capabilities of the Group to develop homegrown Large Language Models (LLMs). In FY2024, the Company completed *Sarashina,* a foundation model with 460 billion parameters, and is accelerating toward commercialization by conducting internal trials of *Sarashina mini,* a model that leverages that expertise. Hironobu Tamba, President & CEO of SB Intuitions Corp., who leads the forefront of homegrown LLM development, explains the current status of development, its competitive advantages, and how this AI strategy will enhance SoftBank's corporate value.

Development status and expectations toward commercialization

Q: SB Intuitions developed an LLM with 460 billion parameters in FY2024. How do you view this achievement?

I see the development of this foundation model as a crucial initiative that lays the cornerstone for the future of AI development in Japan. Today, AI development starts by developing a very high-performance, large-scale AI that acts as a "teacher." This "teacher" AI possesses a vast amount of knowledge, but it requires significant computing resources and electricity to operate. This presents challenges in terms of cost and response speed for everyday business use. Therefore, from the knowledge held by this "teacher" AI, we are developing a lighter, faster, and more power-efficient "student" AI. It is this optimized "student" AI that will actually be used by many of our customers.

In other words, to continuously create high-performing "students," a superior "teacher" that serves as their source is essential. If we were to depend on "teachers" from other countries, we would face the risk of suddenly losing our freedom of development due to changes in licenses or regulations. This is the background to why SB Intuitions took on the challenge of developing a large-scale foundation model with 460 billion parameters, and I believe it was an essential step for Japan to build its own AI ecosystem for the future.

Q: SB Intuitions developed the 70 billion-parameter *Sarashina mini*. What is the strategic intention behind this?

The strategic intention behind developing this model is to accelerate the practical deployment of AI across society and to enable further advancement of future LLMs.

First, a model that is well-balanced in terms of response speed, answer accuracy, and cost is essential for many client companies to implement AI. *Sarashina mini* has been optimized using techniques such as "model distillation*" to meet diverse needs while maintaining, as much as possible, the high-level performance of the large-scale foundation model developed earlier.

However, the role of this model does not end there. *Sarashina mini,* while being an outstanding "student," also becomes an important component for creating the next generation of AI. Specifically, by combining multiple 70 billion-parameter models with different areas of expertise, we will evolve them into an even more powerful AI, like a "team of specialists." By continuously training this "team of specialists," we will efficiently build the next-generation "teacher" AI with even higher performance in a short period, aiming to accelerate the development of a one trillion-parameter scale LLM.

Q: Internal trials for *Sarashina mini* are underway. How is progress toward commercialization?

The response has been highly encouraging, and we are steadily preparing for commercialization in the fall of 2025, as originally planned. SoftBank employees, who regularly use cutting-edge AI like *ChatGPT Enterprise* and *Gemini,* have high standards, so to be honest, the initial internal feedback was tough. However, this feedback was extremely valuable to SB Intuitions, and we have made updates almost weekly, incorporating the high-level requests from employees. As a result, employee satisfaction has steadily improved, and I am confident that the product is heading in the right direction.

Competitive advantages and "multi-LLM strategy"

Q: With LLMs from overseas becoming more prevalent, what do you see as the strengths of *Sarashina*?

The strengths of *Sarashina* lie in being a "high-quality LLM rooted in Japanese language and culture" and in its ability to realize "sovereign AI."

As a homegrown LLM, being a "high-quality LLM rooted in Japanese language and culture" allows it to accurately understand the complex nuances and contexts of the Japanese language and respond appropriately to specific wording and professional tasks. For example, the concept of "guardrails," which control inappropriate expressions that AI should not generate or information it should not output, differs greatly depending on the country and culture. Even interpretations of copyright vary across nations. This level of meticulous attention to legal regulations, social norms, and even the sentiments of native Japanese speakers is a strength that only a homegrown LLM can achieve. With this homegrown LLM as a foundation, we want to evolve it into a truly customized AI that aligns with the specific operations of each client company, thereby contributing deeply to their businesses. Such initiatives are already underway. For example, we are jointly developing an LLM and AI agents specialized for the pharmaceutical industry with Chugai Pharmaceutical Co., Ltd., aiming to speed up new drug development. We have also begun joint research and development of an LLM specialized for finance with Mizuho Financial Group, Inc.

Being a "sovereign AI" becomes even more important when AI plays a core role in business. Dependence on overseas LLMs carries not only the concern of a company's confidential information being unintentionally transferred abroad, but also serious risks related to business continuity itself. For example, if an AI is controlling a manufacturer's production line, and its use is suddenly restricted due to changes in foreign laws or international affairs, the factory's lines could be shut down. To solve this challenge, SoftBank emphasizes three types of sovereignty—"technology," "data," and "operations"—as well as the nation's own "laws and regulations." "Technological sovereignty" means developing our own LLM and controlling what data it learns; "data sovereignty" means safely managing customer data in domestic AI data centers; "operational sovereignty" means having domestic operators manage that infrastructure; and "laws and regulations" means establishing rules for AI use and development based on Japanese laws and ethics. By building a sovereign AI that fulfills these elements, we can meet the high-level needs of government, universities, research institutions, and corporations that handle confidential information.

Q: SoftBank advocates a "multi-LLM strategy" that handles various LLMs. How will *Sarashina* be positioned within this strategy?

SoftBank's "multi-LLM strategy" is based on the idea of selecting the optimal AI according to the sensitivity of information handled by the client company.

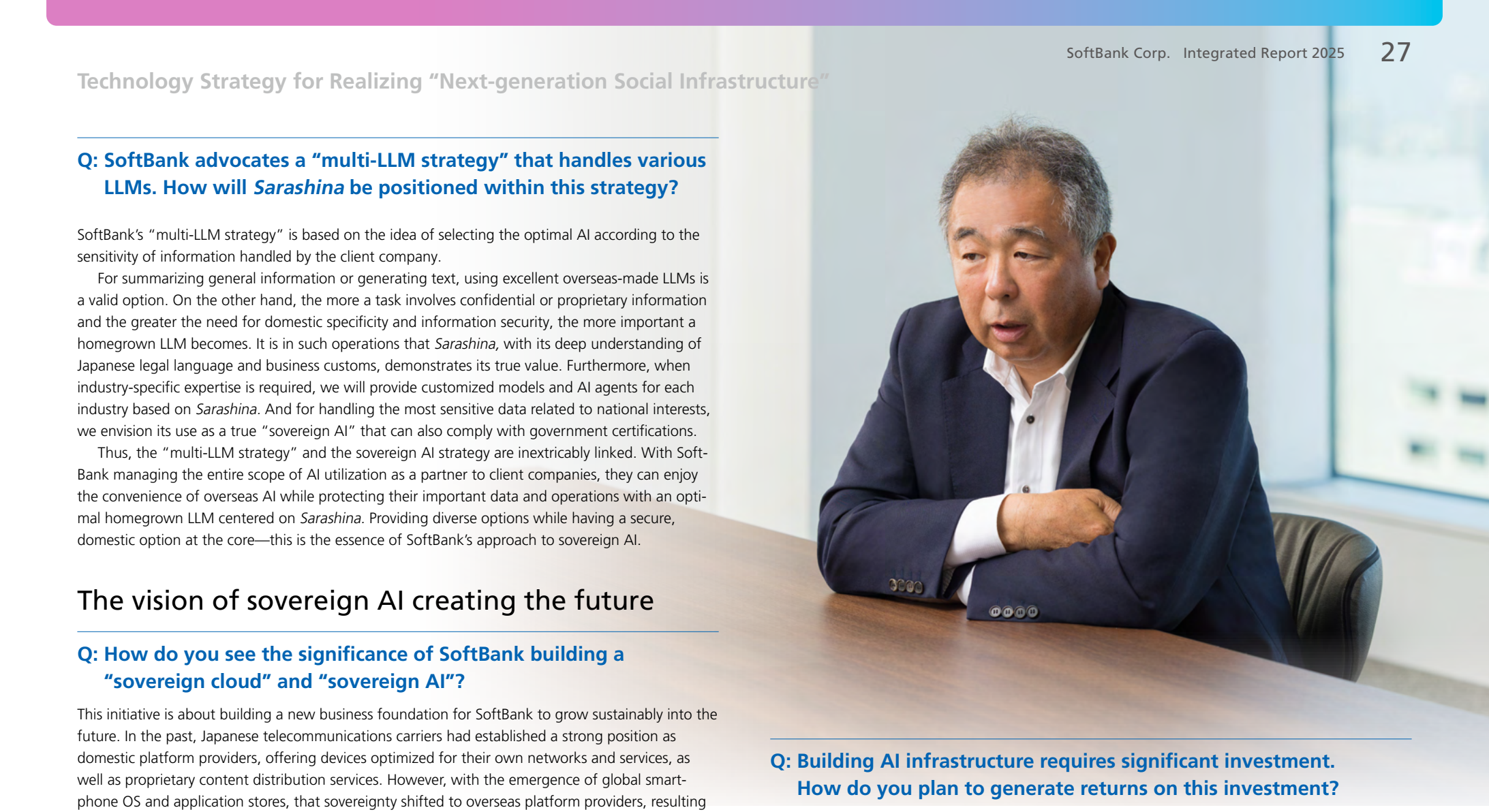
For summarizing general information or generating text, using excellent overseas-made LLMs is a valid option. On the other hand, the more a task involves confidential or proprietary information and the greater the need for domestic specificity and information security, the more important a homegrown LLM becomes. It is in such operations that *Sarashina*, with its deep understanding of Japanese legal language and business customs, demonstrates its true value. Furthermore, when industry-specific expertise is required, we will provide customized models and AI agents for each industry based on *Sarashina*. And for handling the most sensitive data related to national interests, we envision its use as a true "sovereign AI" that can also comply with government certifications.

Thus, the "multi-LLM strategy" and the sovereign AI strategy are inextricably linked. With SoftBank managing the entire scope of AI utilization as a partner to client companies, they can enjoy the convenience of overseas AI while protecting their important data and operations with an optimal homegrown LLM centered on *Sarashina*. Providing diverse options while having a secure, domestic option at the core—this is the essence of SoftBank's approach to sovereign AI.

The vision of sovereign AI creating the future

Q: How do you see the significance of SoftBank building a "sovereign cloud" and "sovereign AI"?

This initiative is about building a new business foundation for SoftBank to grow sustainably into the future. In the past, Japanese telecommunications carriers had established a strong position as domestic platform providers, offering devices optimized for their own networks and services, as well as proprietary content distribution services. However, with the emergence of global smartphone OS and application stores, that sovereignty shifted to overseas platform providers, resulting in an expansion of the "digital trade deficit" as Japan's wealth flowed abroad. This bitter experience of relinquishing our position as a platform provider is a lesson we must not repeat in the age of AI. Now that AI is becoming a cornerstone of society, we have a strong determination to learn from this lesson, protect our national interests, and this time, take the initiative in business with our own hands. The "digital public infrastructure" that SoftBank is building, including our homegrown LLMs and AI data centers, is the foundation for developing a huge domestic market and deploying diverse services within it. This will create new growth opportunities for SoftBank.



Q: Building AI infrastructure requires significant investment. How do you plan to generate returns on this investment?

SoftBank's strategy is not to wait until the entire infrastructure is fully built out before monetization. Rather, we aim to consistently generate profits along the way from individual businesses such as AI solutions and cloud services. It might be easier to understand if you imagine the business model of Japan's private railway companies. They did not wait until their entire railway lines were completed before monetization. Instead, in the process of extending their lines, they generated revenue by developing commercial complexes at stations to offer various services and by developing residential areas along the railway lines. Similarly, SoftBank believes that this combination of a long-term development perspective and short-term business viability is the key to achieving sustainable growth.

Q: Some have expressed concerns about the return on investment due to the rapid pace of technological evolution, with emerging companies like DeepSeek developing high-performance models with less funding. How do you view this risk?

At SoftBank, we see movements in the industry like DeepSeek not as a risk, but rather as an opportunity that validates the soundness of our strategy.

The case of DeepSeek is a prime example of the latest trends in AI development, and SB Intuitions has been closely monitoring and analyzing it in detail. Traditionally, in the “tuning phase” after a foundation model has completed its basic learning, it was common to have the AI learn from a set of questions and answers created by humans. However, the brilliance of DeepSeek’s approach is that they have the AI, not humans, generate this question-and-answer set itself, making the process more efficient. Through this, they have succeeded in enhancing logical reasoning for tasks with definitive answers, like mathematics. This “training AI with AI” method is a clear validation of the development strategy that SB Intuitions has been promoting, where a “teacher AI nurtures a student AI.”

However, the important point here is that this tuning method is only possible with a powerful “teacher” AI at its base—in other words, a high-performance foundation model. To build this foundation model from scratch and continuously evolve it, large-scale investment in AI computing infrastructure is still essential. In the competition to develop the core part that determines a model's performance, the scale and quality of the AI computing infrastructure remain the key to success.

Therefore, these industry trends actually highlight the importance of SoftBank's investment in large-scale AI computing infrastructure and our development of a high-performance foundation model. The technological evolution shown by DeepSeek is not a risk to SoftBank's strategy; on the contrary, it proves its validity.

Q: How will SB Intuitions contribute to the enhancement of SoftBank’s corporate value?

I believe the homegrown LLMs developed by SB Intuitions will become a high-value-added proprietary technology that drives SoftBank’s future growth. SoftBank is making large-scale investments to build one of Japan's largest AI computing infrastructures and is also planning to open massive AI data centers in Hokkaido and Osaka Prefecture. By integrating SB Intuitions’ LLMs with SoftBank’s state-of-the-art AI infrastructure, we will realize a “sovereign AI” and “sovereign cloud” with competitive advantages that no other company can match.

Until now, SoftBank has been an operator that excels at quickly introducing superior products and services from around the world and popularizing them among consumers and businesses. From now on, in addition to this strength, we will evolve into a company with product-creation capabilities—what in Japan is called “monozukuri”—to develop the foundational technologies for society and pioneer new markets. I am confident that the challenge undertaken by SB Intuitions will lead to the sustainable growth of the entire Group and the enhancement of its corporate value.

* Model distillation: a technique to improve the performance and optimize smaller, lighter models by generating training data with a large-scale, high-performance AI model.

“AI-RAN” Initiative

“AI-RAN”: Evolving mobile networks into AI networks

“AI-RAN” is a technical concept for integrating a radio access network (RAN), which consists of antenna equipment and base stations, with AI on the same hardware infrastructure (see the figure on the right).

Conventional RAN operated on expensive, dedicated telecommunications hardware. The basic idea of “AI-RAN” is to implement its functions in software using GPUs, which excel at parallel processing of complex calculations, and to also utilize these GPUs for providing AI applications such as inference. By running RAN functions on relatively inexpensive general-purpose servers, cost benefits and network scalability can be achieved. Furthermore, we also aim to improve capital expenditure efficiency by generating revenue from providing AI applications. The Company has been working in close collaboration with NVIDIA since 2019 to make this a reality.

Key feature (1):
Enhancing the competitiveness of mobile services and significantly reducing electricity consumption

With current RAN, which is not equipped with AI, communication areas are adjusted for each base station. This created imbalances in the use of radio waves and electricity when traffic surged within a communication area. As a result, there are issues such as localized degradation of communication quality and inefficient electricity consumption. With “AI-RAN,” the AI of adjacent base stations coordinate autonomously, leading to the efficient use of radio waves and enabling the provision of an optimal communication environment according to the situation. Furthermore, because computing resources can be shared among base stations, this also leads to a significant reduction in electricity consumption.

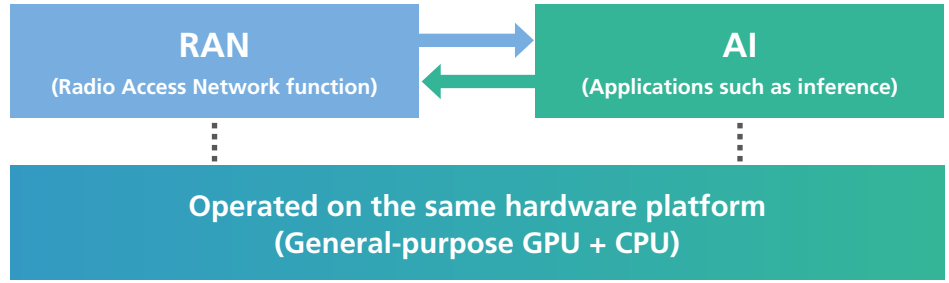
Key feature (2):
Realizing distributed AI data centers

By installing GPUs near mobile base stations, we will evolve the mobile network into a distributed AI data center. Currently, AI computation is mainly performed in the cloud via the Internet, but this results in response times of several hundred milliseconds. However, if GPUs are installed near mobile base stations and AI computation is performed closer to the user, the response time can be significantly reduced to several tens of milliseconds. This will make it possible, for example, to analyze road conditions in real-time based on camera footage from autonomous driving vehicles and make instantaneous decisions. Another advantage is that high security can be ensured because data is handled within a closed network.

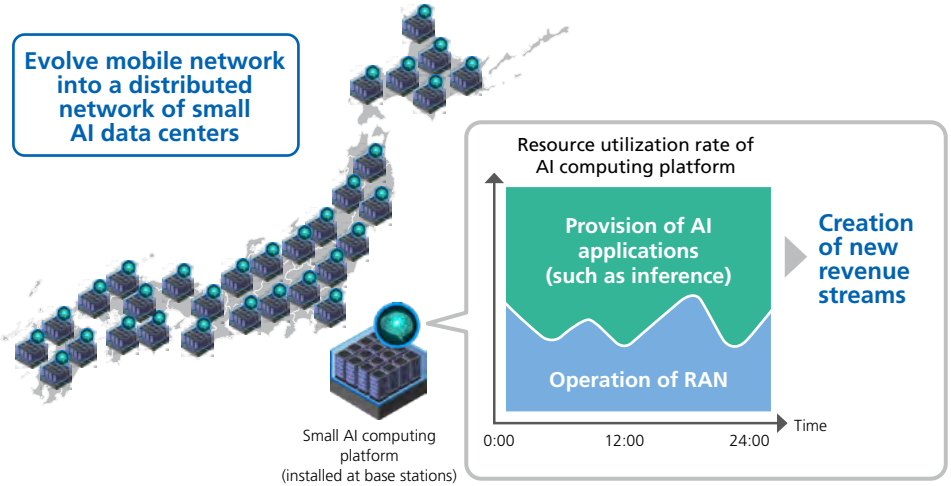
Key feature (3):
Creating new revenue streams

By integrating RAN and AI on the same hardware infrastructure, it is possible to sell surplus computing resources when they are not allocated to RAN operations. There is a surplus of computing resources most of the time because a ceiling is set to prepare for peak mobile traffic (see the figure below). By providing these computing resources as AI applications for inference and other purposes, we will create new revenue streams.

“AI-RAN”: Integrating RAN and AI on the same hardware infrastructure



Realizing distributed AI data centers and creating new revenue streams



Interview with Head of the Research Institute of Advanced Technology

Strategy of the Research Institute of Advanced Technology: Taking on the challenge of business creation as a "technology compass"

Ryuji Wakikawa
Vice President & Head of the Research Institute of Advanced Technology

Q: Please tell us about the background and overview of the Research Institute of Advanced Technology.

We established the Research Institute of Advanced Technology in April 2022. Our Company has long excelled at rapidly launching services that incorporate new technologies. On the other hand, "R&D" was seen as an activity somewhat distant from our business, and we were not always proactive in this area. Because we emphasize speed, we considered acquiring necessary technologies through investment or acquisition of companies that possessed them to be an effective option. However, when our current President & CEO, Junichi Miyakawa, was the CTO (Chief Technology Officer), he set a policy that "R&D is an important investment for the future of the Company and should be pursued properly." In response to this policy, the Advanced Technology Division was formed in 2016, and I became its head.

A major achievement during the Advanced Technology Division era was the R&D of "HAPS*1," or flying base stations. Our Company is a global leader in HAPS R&D, holding the world's largest number of related U.S. patents*2. Additionally, in 2018, anticipating the era of autonomous driving and MaaS (Mobility as a Service), we led the establishment of MONET Technologies Inc., a joint venture with Toyota Motor Corporation, working to create the future of transportation and solve social issues.

Following Miyakawa's appointment as President & CEO in April 2021, the division came under his direct control in April 2022 and was renamed the "Research Institute of Advanced Technology." Currently, over 70 projects are underway on themes such as "AI-RAN," "HAPS*1," autonomous driving, and quantum computers, with more than 150 members engaged.

*1 HAPS (High Altitude Platform Station): generic name for a system that provides telecommunication services over wide areas by operating an unmanned aircraft that continually flies in the stratosphere for extended periods of time like a telecommunication base station.
*2 Using PatSnap's "PatSnap Analytics," the number of U.S. patents with CPC (Cooperative Patent Classification) H04B7/18504 granted that are still in force is aggregated on a case-by-case basis (as of May 8, 2025).

Q: What are the main differences between SoftBank's Research Institute of Advanced Technology and the research institutes of other companies?

First is the difference in how we set our goals as a research institute. At our Research Institute of Advanced Technology, we set our goal as "bringing technology to market," in other words, "business creation." This is a major difference from other companies. I believe it is common for many research institutes at other companies to have hundreds of researchers with doctoral degrees who advance their research based on their own interests, and their performance is evaluated by the papers they publish. Of course, we also value the publication of papers, and we have many cases where our papers are selected as the best at academic conferences, but that is not our top priority.

Second is the motivation we provide to our researchers for business creation. I often tell researchers: "Do not just develop the technology; constantly think about how it will generate revenue. Sketch out a P&L." Since the researcher is the most knowledgeable and passionate about the technology, we have them build a simple business plan. We believe that if they do not consider the

business model and how to bring it to market, the technology will not be commercialized when it is taken to the business divisions.

Third is our personnel composition. The institute is not composed solely of researchers. About half of our members are from business development and legal affairs, which is a feature that allows us to approach things quickly from both technological and business perspectives. If a simple business plan built by a researcher looks promising, these members get involved and begin a detailed examination. We make the business plan more concrete from the perspectives of market size, potential costs based on detailed amortization, and potential legal risks. Our Company has very strict cost management, so it can be difficult to secure a budget just by saying "Please give us an additional several billion yen for R&D." However, if we present a concrete business plan and propose that "We expect several tens of billions of yen in revenue, so we would like a business budget of several billion yen," it becomes easier to get a decision like, "If you have such a solid business plan, you can move forward."

Fourth is our use of partnerships with other companies. Our policy is not to develop everything in-house; we emphasize improving speed and quality by teaming up with partners. With "business creation" in mind, we carefully examine what our institute should work on as core technology and where we should collaborate with partners, and we strive for speedy R&D.

Q: What is the background that makes such research possible?

The foundation lies in the mindset of our President & CEO, Junichi Miyakawa. Having been a university faculty member and worked on technology development at an automotive manufacturer's research institute and writing papers, I used to think, "If we have good technology, we can make money without making any effort." However, what I keenly realized after joining this Company is that "Technology is merely a trigger for business success. What is important is the business model you create afterward, how you secure resources, and how you market it." I learned this through years of working with Miyakawa, thus I am now putting it into practice as the head of the Research Institute of Advanced Technology.

Q: How was the "AI-RAN" concept born?

The "AI-RAN" concept was born as we addressed the massive computation associated with virtualization (realizing with software the processing previously handled by dedicated communications hardware).

In 2019, Rakuten Mobile, Inc. announced that it had achieved virtualization on its network, which became a major topic in the telecommunications industry. Virtualization has significant merits such as flexibly scaling base stations according to mobile traffic demand, cost, and the ease of adding functions via software updates. However, our assessment was that the technology was not yet mature enough to handle the massive traffic by our more than 20 million smartphone subscribers at that time.

So, when we considered how to achieve virtualization in the future, we focused on the GPU. We thought that the technology cultivated in graphics processing and its parallel processing capabilities were well-suited for the massive signal processing of radio units. Initially, the GPU performance was not sufficient, and we could not get the performance we wanted. As we continued through trial and error, NVIDIA announced an AI computing infrastructure equipped with a high-performance GPU, which led to the hypothesis that "If we use this to create a mechanism for signal processing of radio units with AI, we could create something amazing." This was the catalyst for the birth of the "AI-RAN" concept.

Q: How did you come to work so closely with NVIDIA?

The collaboration with NVIDIA started with a project to provide a cloud gaming service leveraging the ultra-low latency feature of 5G. That project itself did not go very well, but it became an opportunity to deepen our relationship with the company. Also, when I learned that a long-time acquaintance had joined the company to work on initiatives to utilize GPUs for telecommunications, I reached out to explore collaboration.

People often assume, "Masa (Masayoshi Son, Chairman & CEO of SoftBank Group Corp.) has a close relationship with Jensen Huang (Founder, President and CEO, NVIDIA), so it must have started with a word from Masa, right?" But "AI-RAN" is a project that we started from the bottom up. Even when this project was on the verge of being shelved internally, we continued to provide resources in terms of both human resources and funding, and we have been working together for several years, so the relationship of trust between our teams on the ground is very strong.

I believe that the reason we were able to reach a position where we can lead globally together with NVIDIA is largely due to our corporate culture. I think other companies also had the idea of using GPUs for telecommunications. However, the speed with which we verified the idea, created an integrated solution product for "AI-RAN" called *AITRAS* for which we have already implemented a demonstration environment in Fujisawa City, Kanagawa Prefecture, was made possible by our culture of emphasizing swift decision-making and investing significant resources in necessary areas.

Demonstration environment for "AI-RAN" implemented in Fujisawa City, Kanagawa Prefecture

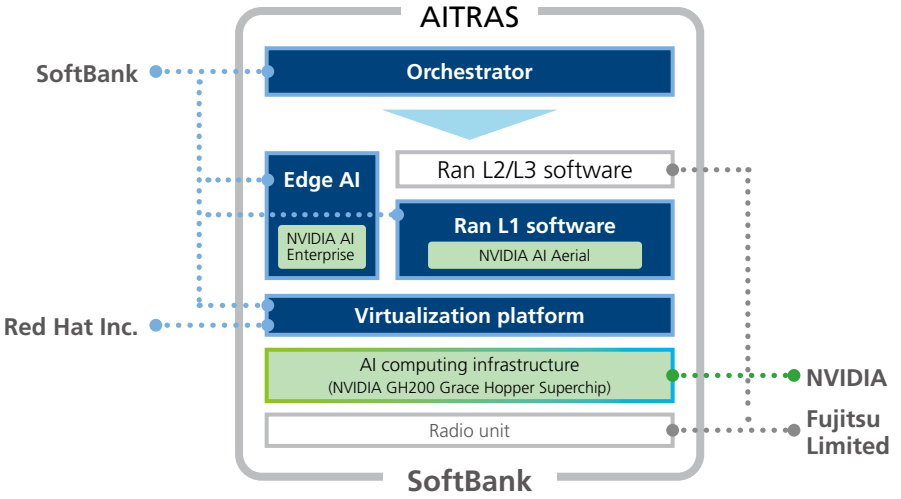

Q: Please tell us about *AITRAS* and how you think it will contribute to SoftBank's growth.

AITRAS, announced in November 2024, is our original integrated solution that embodies the "AI-RAN" concept we advocate. The diagram below shows the components that make up *AITRAS*, illustrating that we are building it in collaboration with various partner companies. We have Fujitsu Limited for the radio units and RAN L2/L3 software*3, U.S.-based Red Hat Inc. for part of the virtualization platform*4, and NVIDIA for the AI computing infrastructure used as the base hardware. I believe this is a good example of our policy of "not developing everything in-house, but emphasizing improving speed and quality by teaming up with partners."

On the other hand, to ensure the quality and operational efficiency required of a telecommunications carrier, we are taking the lead in developing the orchestrator that optimizes the entire system and the RAN L1 software*5 based on the NVIDIA AI Aerial platform. This collaboration allows us to achieve carrier-grade (the high quality standards required of a telecommunications carrier) stability and performance, power saving, and efficient allocation of computing resources to AI and RAN in the aforementioned demonstration environment.

There are two main ways the development of this *AITRAS* can contribute to our Company's growth. One is by introducing *AITRAS* into our own mobile network infrastructure, making the mobile network "AI-native." Not only will the AIs of adjacent base stations be able to collaborate to autonomously provide optimal communication quality, but by turning the mobile network into a small AI data center (P29), we also expect to generate a new revenue source by selling computing resources externally. The other is to sell this *AITRAS* to global telecommunications carriers. In the telecommunications industry, network investment has often been considered from a cost-reduction perspective, and there have been concerns about the stagnation of innovation in the industry. However, *AITRAS* opens up the possibility of generating new revenue with AI using telecommunications infrastructure. We believe this is a very positive approach that can promote investment and contribute to the sustainable development and revitalization of innovation in the entire telecommunications industry. We are working to introduce it into our own network and sell it to global telecommunications carriers starting in FY2026 at the earliest.

The components of *AITRAS* and its development companies



*3 RAN L2/L3 software: software that manages the traffic of data transmission and reception.
*4 Virtualization platform: a system platform for running communication functions on general-purpose servers instead of dedicated hardware.
*5 RAN L1 software: software that handles the most fundamental aspects of communication, such as the physical signal processing for transmitting and receiving radio waves.

Q: The AI-RAN Alliance was formed in February 2024. What is its aim?

The "AI-RAN" concept has enormous potential, but it would take a long time for SoftBank to realize it alone. Therefore, we launched the AI-RAN Alliance to involve base station vendors and others to unite the entire industry and create a major innovation. In particular, it was important to have major base station vendors such as Nokia (Finland), Ericsson (Sweden), and Samsung (South Korea) participate. As a telecommunications carrier, it is crucial to have base station vendors compete in a healthy manner and to be able to flexibly select the optimal technology. It is very rare for three base station vendors to participate in such an alliance from the outset. However, by appealing to the theme of "AI," which no one can ignore, and by showing the results of the "AI-RAN" that we had been developing in advance and already running in a demonstration environment, we persuaded them to become Founding Members in just about three months. As a result, when we announced the AI-RAN Alliance at the MWC Barcelona 2024 (one of the world's largest mobile-related exhibitions), we were able to attract a great deal of attention.

Also, the participation of Dr. Alex Jinsung Choi in the AI-RAN Alliance was met with surprise in the industry. He served as the chairman of the O-RAN (Open RAN) Alliance for two years, from June 2022 to June 2024, and has been a leader driving innovation in the industry. I personally persuaded him, saying, "Let's do AI-RAN together."

More than a year has passed since the announcement of the AI-RAN Alliance, and it has grown to include over 100 member companies and organizations (as of July 2025). We expect this number to continue to increase, and we feel that the ecosystem is expanding rapidly. We have created a wonderful framework, and we want to accelerate the efforts for "AI-RAN" throughout the industry.

Q: Besides "AI-RAN," what other research areas at the Research Institute of Advanced Technology are you excited about?

Besides "AI-RAN," I have high expectations for "Free Space Optical Communication" and "quantum computers."

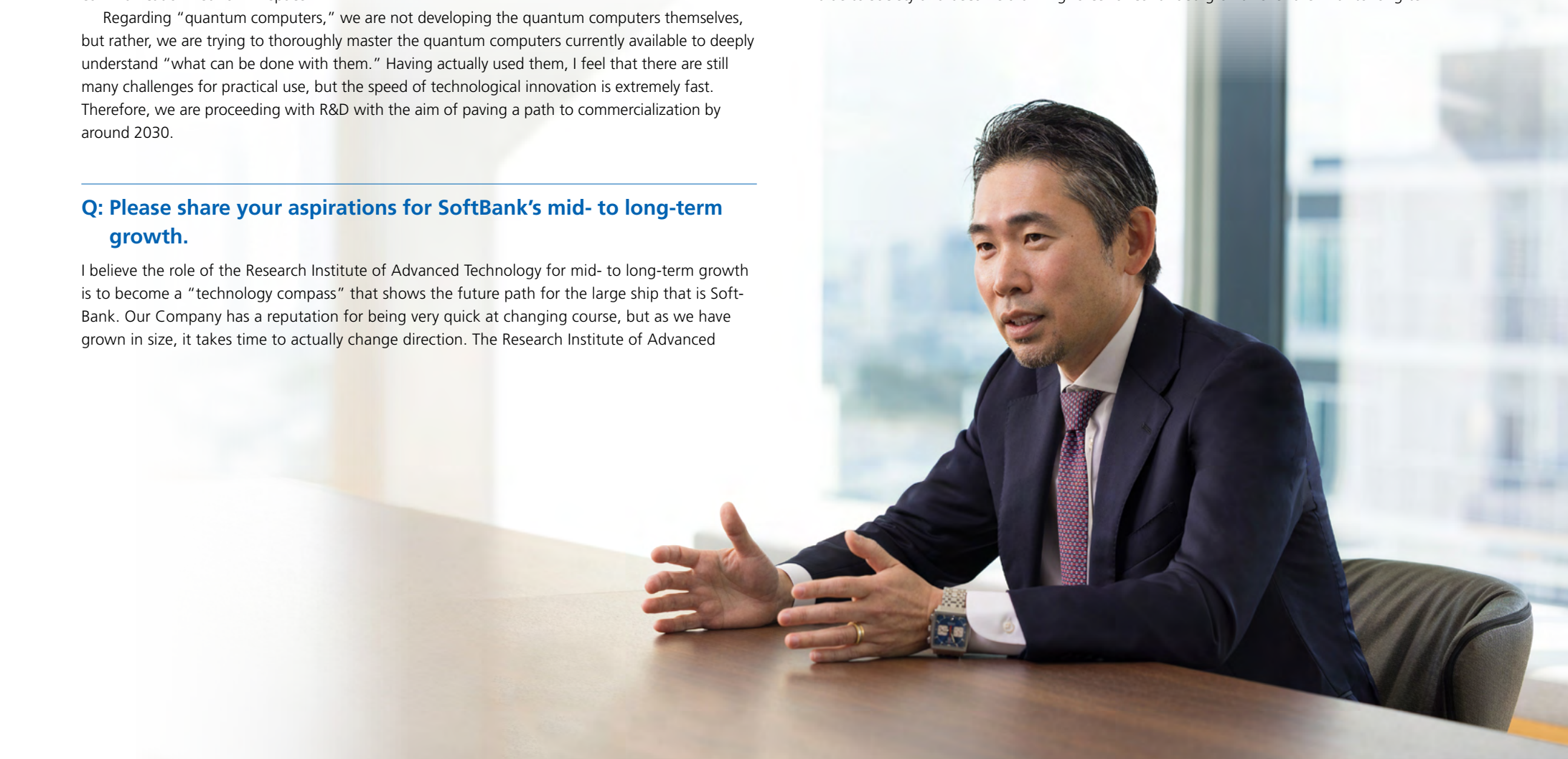
"Free Space Optical Communication" is a technology that is expected to achieve higher speed, larger capacity, and lower latency communication compared to conventional radio waves. In addition, because the beam is extremely narrow, it is less prone to interference and is difficult to intercept during communication. If this technology is introduced, it will be possible to realize large-capacity communication not only between the ground and low-earth orbit satellites, but also between low-earth orbit satellites and HAPS*[1], so I believe we can build a more free and flexible communication network in space.

Regarding "quantum computers," we are not developing the quantum computers themselves, but rather, we are trying to thoroughly master the quantum computers currently available to deeply understand "what can be done with them." Having actually used them, I feel that there are still many challenges for practical use, but the speed of technological innovation is extremely fast. Therefore, we are proceeding with R&D with the aim of paving a path to commercialization by around 2030.

Q: Please share your aspirations for SoftBank's mid- to long-term growth.

I believe the role of the Research Institute of Advanced Technology for mid- to long-term growth is to become a "technology compass" that shows the future path for the large ship that is SoftBank. Our Company has a reputation for being very quick at changing course, but as we have grown in size, it takes time to actually change direction. The Research Institute of Advanced Technology will lead the way without fear of mistakes or failures, and I want to guide the way while discerning what lies in the future as we create new technologies ourselves, rather than just following other companies.

I also believe that another role is to produce more "seeds" that will become themes for our future mid- to long-term growth. Like "AI-RAN," our mission is to find and nurture "seeds" that can become future pillars of our business and pave the way for commercialization, in other words, to "turn 0 into 1." This will lead to the business units growing "seeds" from "1 to 10, and then to 100." It is in our Company's DNA to use technology to change conventional wisdom and create new markets, such as the spread of broadband with ADSL technology from 2001 and the first introduction of the iPhone 3G in Japan in 2008. By continuously creating new business seeds from this institute and leading their widespread practical deployment, we aim to constantly provide new value to society and become a driving force for continued growth over the mid- to long-term.



Intellectual Property Strategy to Support Long-term Growth

Basic policy

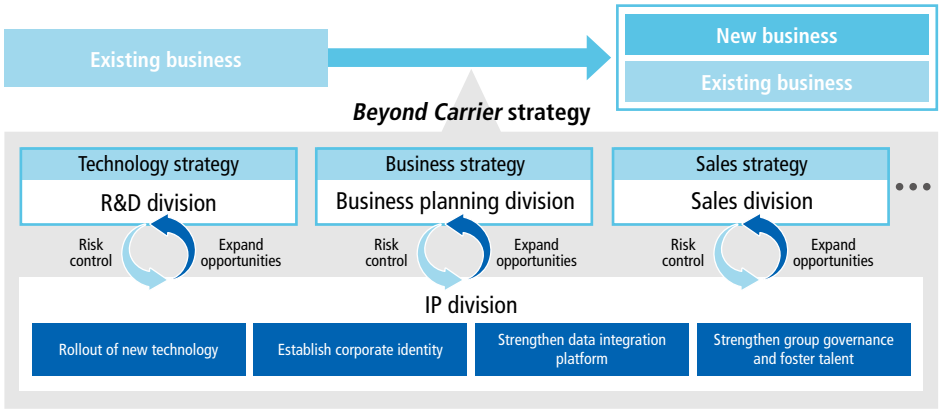
In the "SoftBank Code of Conduct," which all executives, employees, and Group companies must observe, SoftBank declares its commitment to "recognizing the importance of intellectual property rights, respecting the intellectual property rights of others, and promoting the proper protection and use of our own intellectual property rights." While respecting the intellectual property of others, we have established and are promoting an "Intellectual Property Strategy" based on the fundamental policy of enhancing corporate value and contributing to the industrial development of society as a whole by striving to actively create, protect, and utilize intellectual property.

We believe that our intellectual property strategy forms the foundation of our business, technology (R&D), and sales strategies. By continuously vitalizing this strategy, we enhance the competitiveness of our services, contribute to customer retention and expansion, and secure an advantage over competitors. Based on this intellectual property strategy, we are addressing social issues by practicing a digital shift that maximizes the use of cutting-edge technologies such as AI and IoT, and by leading the promotion of DX in society and all industries. Furthermore, by strategically utilizing this intellectual property, we will accelerate innovation and contribute to the realization of a sustainable and prosperous society.

Organization

In addition to our core telecommunications business, actively expanding new businesses that leverage cutting-edge technologies and business models requires an even stronger, comprehensive commitment to ethics and responsibility to ensure compliance, including with respect to intellectual property.

The Intellectual Property Division, which manages intellectual property rights, promotes the intellectual property strategy by strengthening collaboration with divisions responsible for business, technology (R&D), and sales strategies. From the perspective of enhancing corporate governance and ensuring its effectiveness, we have also established a multi-faceted internal collaboration system to strategically and efficiently support business execution, in addition to a risk control function for intellectual property.



Major initiatives

Strengthening the Group's IP governance and fostering IP human resources

To promote the establishment of a Group-wide intellectual property governance system, we have formulated intellectual property governance standards and conduct regular assessments for target subsidiaries and affiliated companies tailored to their corporate phase. We also co-host "Intellectual Property Practice Workshops" with SoftBank Group Corp. to deepen and broaden the intellectual property strategy for the Group by sharing expertise in intellectual property practice while maintaining the independence of each Group company. Furthermore, to promote intellectual property awareness primarily among university and graduate students, we have been giving lectures on our intellectual property strategy since 2019, entitled "Practical Challenges and Responses by SoftBank Legal," in the Advanced Business Law Program at the University of Tokyo.

Furthermore, when establishing an operating company, we aim for the early implementation of new business models using cutting-edge technologies from around the world, and support the expansion of opportunities to create and utilize intellectual property through measures ranging from pre-establishment intellectual property due diligence to post-establishment development of intellectual property-related regulations, human resource training, and promotion of right acquisition.

Patent strategy in advanced technology fields

We hold approximately 2,000 patents in Japan and overseas. The inventions protected by these patents cover a wide range, including not only mobile communication technology but also AI and battery-related technologies. In recent years, we have been particularly active in R&D in advanced technology fields such as HAPS* and "AI-RAN" (P29). To establish a competitive advantage in these areas and to advance future business development favorably, we are also focusing on filing patent applications for related inventions to strengthen our intellectual property portfolio.

* HAPS (High Altitude Platform Station): generic name for a system that provides telecommunication services over wide areas by operating an unmanned aircraft that continually flies in the stratosphere for extended periods of time like a telecommunication base station

Establishment of the "SoftBank Patent Award" to recognize outstanding employee inventions

As a new initiative to foster a corporate culture that generates highly original and outstanding inventions throughout the Company and to promote the utilization of intellectual property, we established the "SoftBank Patent Award" (hereinafter "Patent Award") in FY2022. The Patent Award is a program in which the President & CEO personally recognizes employees who have made outstanding inventions. In the screening process, a key criterion is the degree to which the patent contributes to current or future business. Inventions that are not only technologically superior but also valuable and closely linked to business strategy are highly evaluated.

Through the Patent Award and other various measures, we will further strengthen our corporate culture that values intellectual property and strive to establish a competitive advantage and achieve sustainable enhancement of corporate value.

2024 Award Ceremony