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Special Feature

Technological-development efforts related to generative AI

Efforts of Sony Group concerning Democratization of Generative AI for Adaptation to Business Operations

Application of Generative AI for Advanced Network Operations at Fujitsu

Promoting the Use of Generative AI and OKI's Innovation Support System

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About ITU-AJ

The ITU Association of Japan (ITU-AJ) was founded on September 1, 1971, to coordinate Japanese activities in the telecommunication and broadcasting sectors with international activities. Today, the principle activities of the ITU-AJ are to cooperate in various activities of international organizations such as the ITU and to disseminate information about them. The Association also aims to help developing countries by supporting technical assistance, as well as by taking part in general international cooperation, mainly through the Asia-Pacific Telecommunity (APT), so as to contribute to the advance of the telecommunications and broadcasting throughout the world.

Efforts of Sony Group concerning Democratization of Generative AI for Adaptation to Business Operations

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1. Introduction

The rapid advancement of generative artificial intelligence (AI) is dramatically changing how companies use AI. In particular, the emergence of large language models (LLMs) has demonstrated the possibility of expanding the use of AI to general business users as well as experts. In this special feature, the efforts of Sony Group to "democratize" generative AI and adapt it to business processes—including technical aspects and actual use cases—are introduced.

2. Overview of Sony Group and Strategy for Generative AI

2.1 Business structure of Sony Group

Generating annual total sales of approximately 13 trillion yen, Sony Group mainly operates in the following six business segments: game, music, picture, finance, semiconductors, and electronics. Each business unit is unique and diverse, and the autonomy of each unit is emphasized under the corporate culture of "free and open-mindedness."

2.2 A vision for generative AI

The Sony Group has a vision of "democratizing AI, technology, and data to enable all Sony Group's employees to become good users in a manner that achieves both creativity and productivity." In particular, we believe that "creativity resides in people, and AI supports creativity," and we aim to increase both the creativity and productivity of creators and the employees who support them by utilizing generative AI properly.

2.3 AI-democratization stack

To democratize generative AI, the Sony Group is building an "AI-democratization stack." As a combination of technologies, this stack will provide the infrastructure needed across the entire Group, including a platform and guardrails that allow all employees to use generative AI with confidence, as well as the educational content and the latest information, including company-wide global events. We have set key performance indicators (KPIs) for each stack, and we are working to accelerate the democratization of generative AI and its business adaptation across the entire Group.

Figure 1: AI democratization strategy

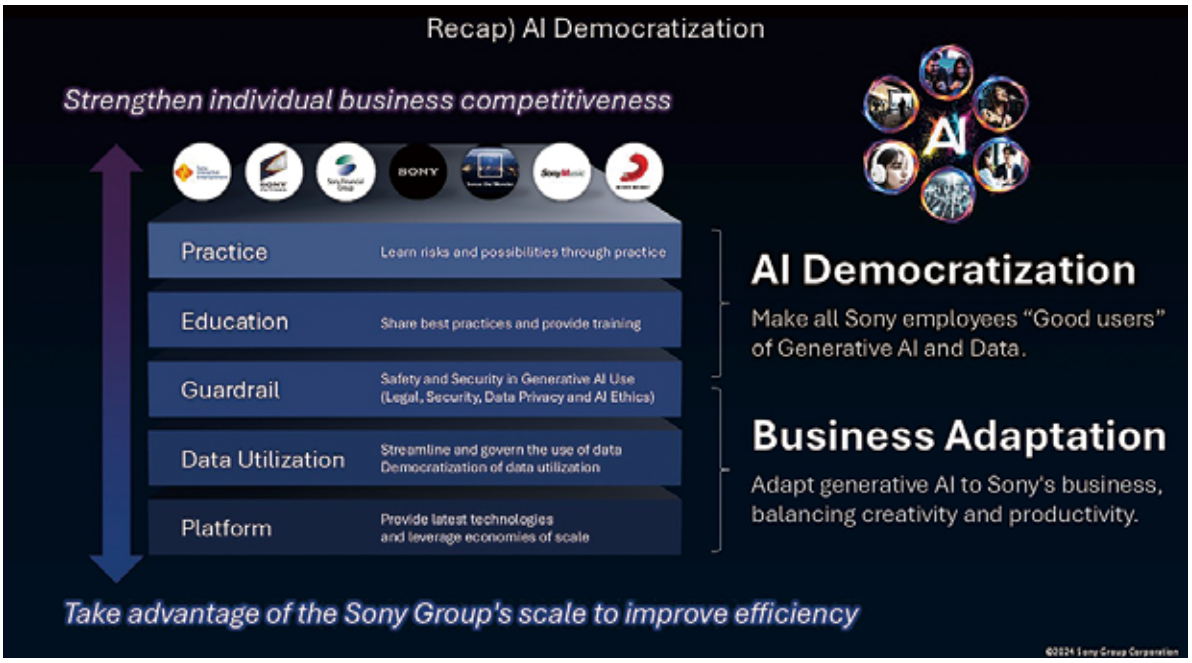
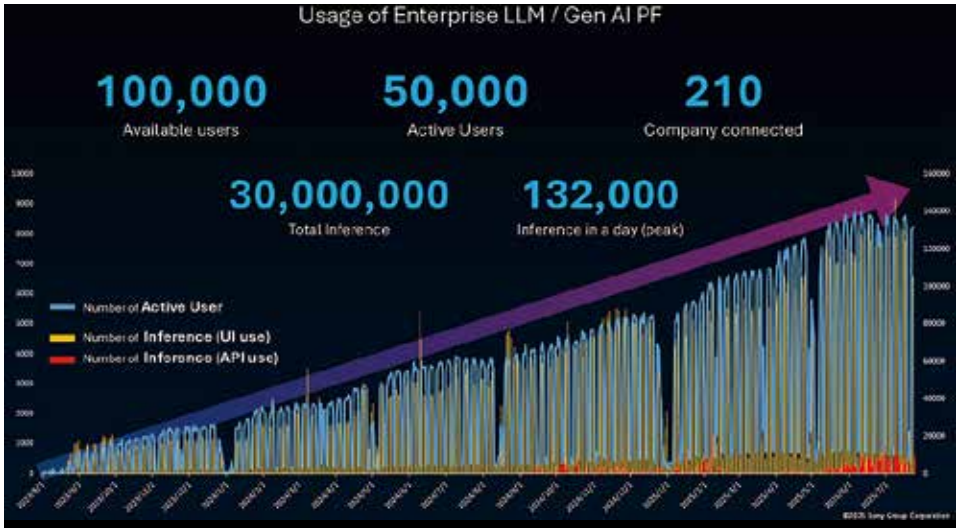


Figure 2: Usage of Enterprise LLM/GenAI PF



3. Enterprise LLM: Foundation for generative AI

3.1 Overview and features

As a first step in democratization of generative AI, Sony Group is providing all employees with a chat-style web application called "Enterprise LLM." Built in a cloud-native, auto-scaling environment mainly using AWS (Amazon Web Services cloud), this app has been used by 210 group companies and has 50,000 active users (as of August 1, 2025).

The key features of Enterprise LLM are listed as follows:

- Security and guardrails: To ensure the appropriate use of internal data, we work with the security, data-privacy, legal, and AI ethics departments to establish systemic security and rules and guidelines.
- Multi-cloud support: To keep up with the rapid evolution of LLMs, Enterprise LLM connects to multiple cloud environments, including AWS, Google Cloud, and Microsoft Azure, and enables use of over 130 LLMs and text-to-image models.
- Use-case optimization: Equipped with various support functions for business use, Enterprise LLM provides AI types and prompt-input assistance optimized for common use cases.

Figure 3: Enterprise LLM

3.2 Usage and effectiveness

Full-scale deployment of enterprise LLM began in August 2023, and since then, it has handled over 130,000 generation requests per day and executed over 20-million inferences as of August 2025. Major cloud-platform providers have also praised it for being in an advanced state with a high level of activity compared to similar services provided by other companies.

To understand usage of Enterprise LLM, we have created an environment that allows us to understand usage in real time while maintaining anonymity. This understanding is enabled by having the AI itself automatically classify and analyze input prompts while taking privacy into consideration.

3.3 Key use cases and productivity benefits

The main use cases of Enterprise LLM within the Sony Group are listed as follows:

1. Writing reports and emails
2. Translation of different languages
3. Program generation and coding support
4. Summarization and analysis of text
5. Generating ideas and brainstorming

For each of these use cases, AI is used to measure productivity improvements in real time. For example, we calculated that using AI in "creating reports and emails" can reduce the time spent on each task by an average of 25 minutes. And we estimated that this time reduction will result in a monthly savings of approximately

50,000 hours across Sony Group.

3.4 Positioning and significance of awareness-raising activities

As for democratization of generative AI, organizational awareness activities are as important as developing the technological infrastructure. Sony Group has positioned our awareness program as a key pillar of the AI-democratization stack, and we are implementing a company-wide initiative with strong executive endorsement. Not simply as training programs, awareness activities are implemented as strategic measures to simultaneously transform organizational culture and promote the use of technology.

According to the data, approximately 50,000 community members accessed educational content via Web and Teams, and 10,000 people participated in events with hands-on sessions and consultations. These figures are evidence that proper educational activities are the foundation for technology adoption of generative AI.

3.5 Multi-layered structure of awareness programs

The awareness-raising activities of Sony Group consist of the following multi-layered approach:

1. Regular events: More than 60 training events are held annually, and "Gen AI Day," which invites other vendors, is held six times.
2. Knowledge sharing by experts: Sharing insights through presentations at major industry events (seven times)
3. Technical consultations: Practical support through 300 technical consultations
4. Ongoing engagement: 7,500 people continue to experience new technology (generative AI) every month after registering

This multi-layered structure is unique in that it satisfies various levels of learning needs, which range from providing basic knowledge for beginners to specialized applications.

3.6 Performance indicators for awareness-raising activity

The effectiveness of our awareness-raising activities is measured by the following three quantitative indicators:

- Monthly active users of generative AI: 8,000
- Total registered generative-AI users: 50,000
- Inquiries to the Technical Support Team (Center of Excellence): 600

These indicators show that awareness-raising activities go beyond simply transferring knowledge and lead to actual adoption of the technology. Of particular note is the correlation between number of participants in awareness-raising programs and number of actual AI users because it demonstrates that effective awareness-raising is an accelerating factor in the spread of technology.

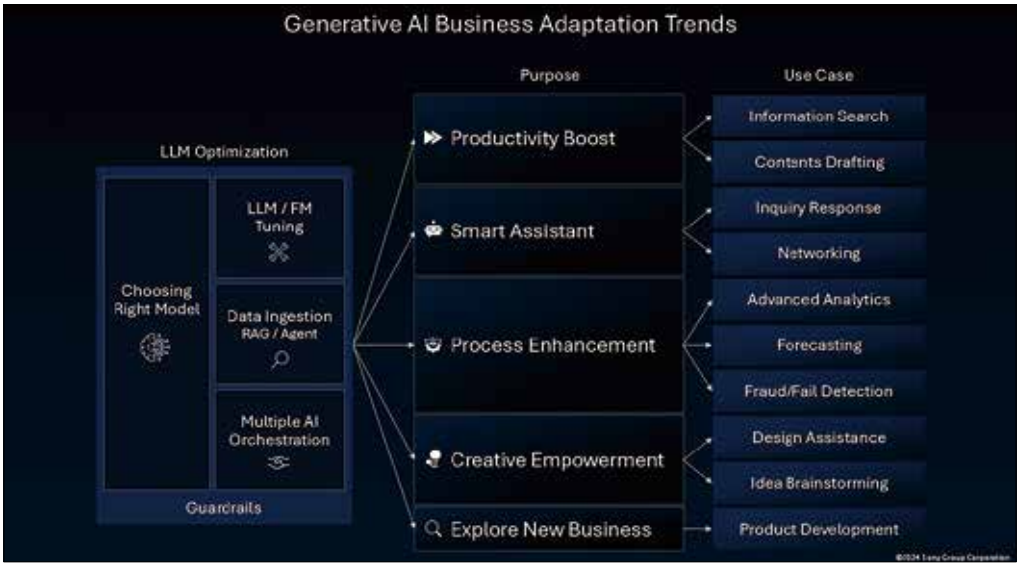
Awareness-raising activities serve as a catalyst for democratizing generative AI, acting as a critical bridge between the technological infrastructure and practical business adaptation. This fact suggests that investments in organizational and cultural aspects of technology adoption are as important as—or even more important than—investments in the technical aspects.

4. Initiatives aimed at business adaptation

4.1 Status of PoC (proof of concept)

Enterprise LLM is an environment for creating experiences, and provides a flexibly customizable PoC environment to facilitate actual business adaptation. Currently, we are conducting PoCs in over 300 departments, 136 of which have been completed, and 51

Figure 4: Business trends in adaptation of generative AI



have already progressed to the production phase for actual business use.

The diverse objectives of the PoC include "productivity boost," "smart assistant," "process enhancement," "creative empowerment," and "explore new business." Initially, basic use cases such as information search and chatbots were the focus; however, as employee literacy has improved and technology has evolved, more-advanced use cases, such as BPR (business-process reengineering) by leveraging AI and the creation of new added value, have also been increasing.

4.2 Technology architecture

The technology architecture that supports business adaptation of generative AI consists of the following three main components:

1. LLM capability: By leveraging Amazon Bedrock, Azure OpenAI Service, Google Cloud Vertex AI, etc., a multi-cloud, multi-LLM environment that enables the use of the best-of-breed LLMs on the market has become available. In addition to models widely used on the market, lightweight models for fine-tuning and task- and industry-specific models are also provided in a scalable manner.
2. Data pipeline: Establishing various technological elements for data processing, which is the core of utilizing generative AI.
3. Business PoC workspace: An environment allowing business users to customize LLMs to suit their use cases easily (by using Bedrock Studio, etc.) is provided.

4.3 Main technical elements

The following three technical elements are prerequisite for utilizing generative AI.

1. Prompt tuning: Controlling model output by optimizing prompts
2. Retrieval-augmented generation (RAG): Incorporating external knowledge to improve answer accuracy
3. Model tuning: Tuning models for specific tasks

The data pipeline combines a variety of technical elements that include:

- Data-source integration: Connectors and web crawlers required for corporate use
- Parsing and chunking: Multimodal context extraction and semantic processing
- Embedding: Selection of highly accurate embedding models and fine-tuning
- RAG utilizing graph structures
- Advanced search and generation: Query extension, fact checking, hallucination suppression, etc.

These technical elements are selected and combined appropriately according to the use case and the balance between cost and accuracy.

Figure 5: Architecture

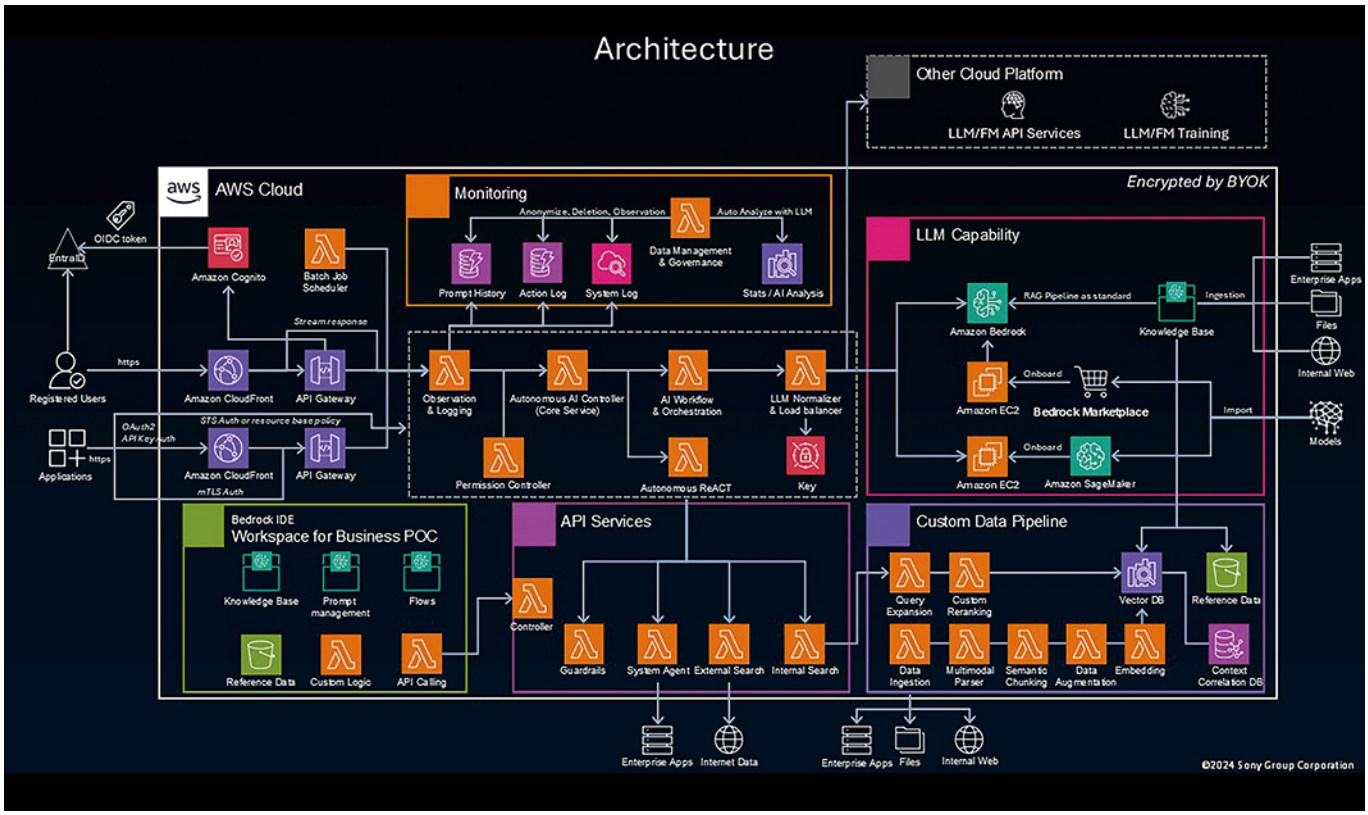
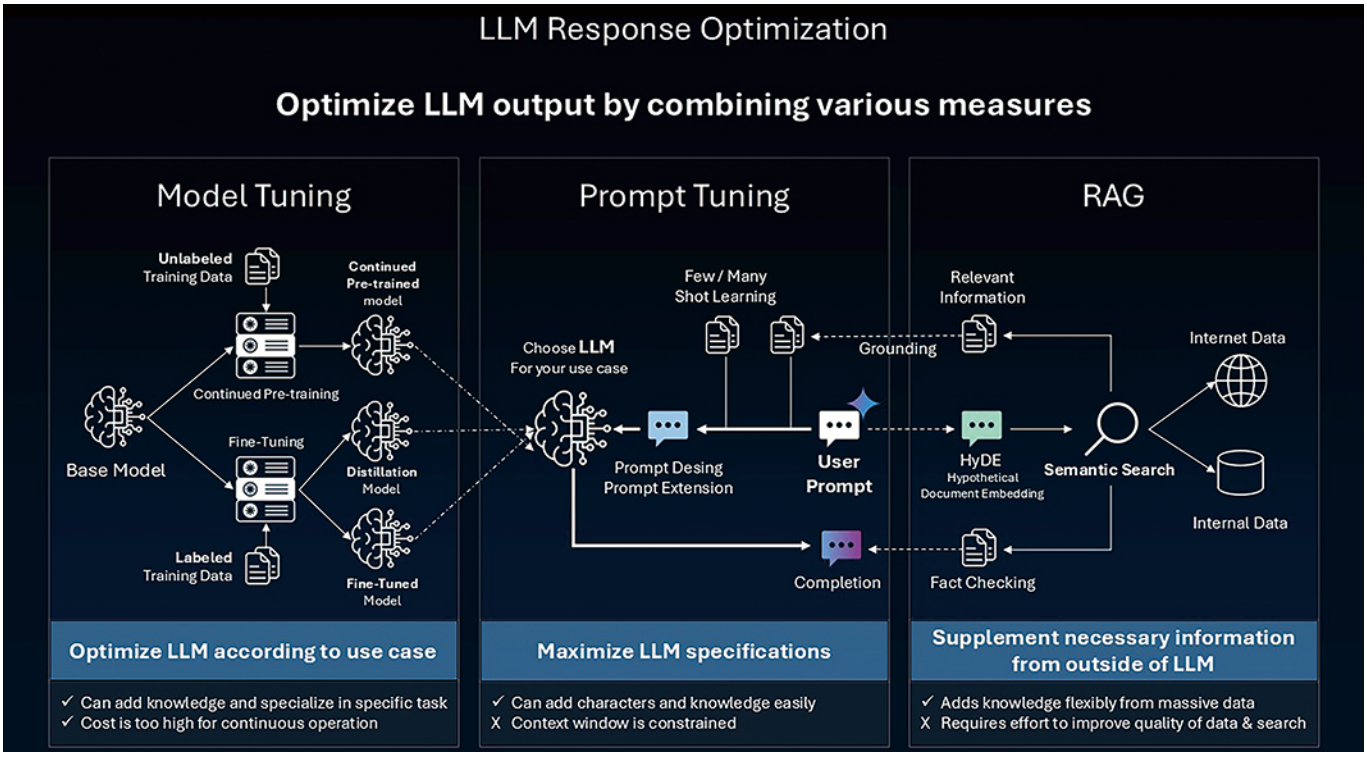


Figure 6: Optimization of response of LLMs



5. Examples of actual application

5.1 Enhancing response to enquiries by Enterprise LLM

In one case in which the response to enquiries by Enterprise LLM itself was enhanced using generative AI, the accuracy of inquiry response and information search was increased by storing related data in a vector database and utilizing RAG. This approach has been implemented in multiple PoCs, and best practices for Enterprises LLM have been accumulated.

5.2 Utilization of unstructured data

By utilizing "multimodal understanding," it is now possible to extract and utilize thoroughly the context of business documents that contain complex tables, graphs, diagrams, and other information that was previously difficult to interpret. The utilization of multimodal technology is expected to become an important part of future business adaptation of generative AI.

6. Expansion into Agentic AI and Future Strategy

6.1 Definition and characteristics of agentic AI

Sony Group is promoting adoption of "agentic AI" as the next evolution of generative AI. Unlike traditional generative AI (which simply responds to input prompts), agentic AI is capable of planning and autonomously executing a series of steps to complete complex tasks.

Agentic AI has the following four main features:

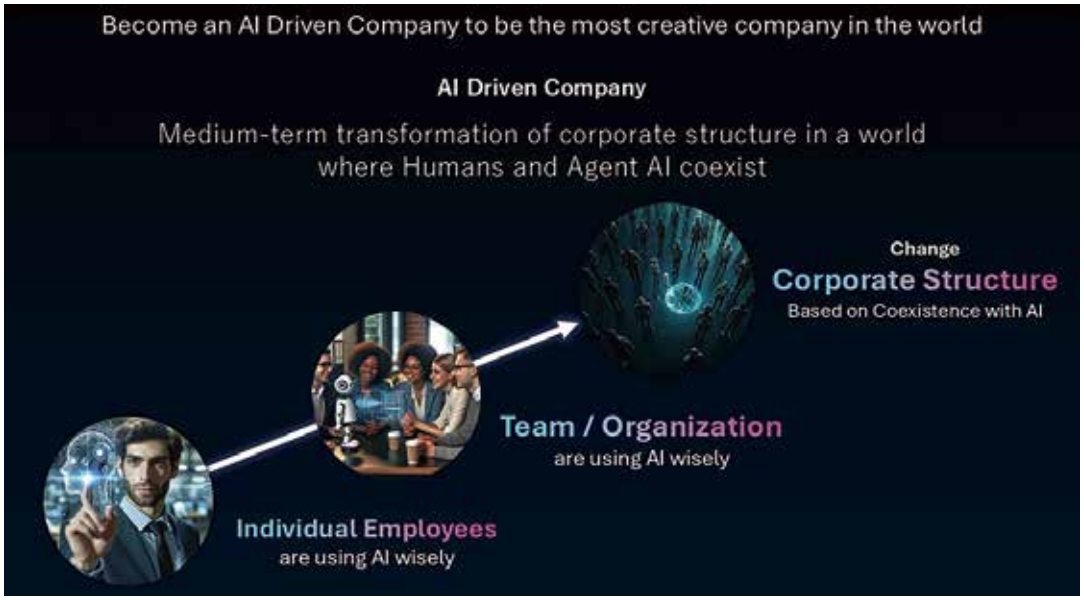
1. Autonomous: The ability to function without continuous human intervention
2. Planning: The ability to devise unique procedures to achieve goals
3. Tool utilization: The ability to use external tools and APIs as needed.
4. Memory & self-improvement: The ability to remember the results of actions and self-improve on the basis of data. These characteristics will enable agentic AI to evolve from a purely reactive AI to a more proactive and autonomous AI. As a result, it will be able to automate more complex business tasks and support decision-making.

6.2 Our vision for transforming into an AI-driven company

Sony Group is currently undergoing a transformation into an "AI-driven company" to become the most-creative company in the world. This signifies a mid-term transformation of corporate structure in a world where humans and AI agents coexist. It comprises three levels:

1. Individual level: Each employee uses AI wisely
2. Team/organization level: Teams and departments collaborate by using AI
3. Corporate-structure level: Transforming corporate structures to accommodate coexistence with AI

Figure 7: Become an AI-driven company to be the most-creative company in the world



By realizing this vision, we aim to build a new corporate model that optimally combines human creativity with the processing capability and efficiency of AI.

6.3 Values of Agentic AI Platform Proposed by D&T PF

Sony Group's "Digital & Technology Platform" (D&T PF) organization is building a comprehensive platform for utilizing agentic AI across the group. The key proposed values of this platform are listed as follows:

1. Sharing generative AI across the Sony group: Sharing generative-AI technology across business units
2. Flexibility without vendor lock-in: Ensuring flexibility to connect with the tools that work best for the user
3. Providing various types of AI agent:
   - Common agents: Basic agents shared across the Sony Group
   - Team agents: Agents shared by teams of different business units
   - Personal agents: Agents specialized for personal use
4. Providing a variety of methods for building AI:
   - Tailor-made development: Advanced customization by using SDKs (software-development kits), etc.
   - Utilizing AI-building tools: Utilizing existing tools such as Bedrock and Claude Studio
   - No-code AI design: A development environment (in which ELLM agents and other tools are utilized) that requires no specialized knowledge

6.4 Strategy for Implementing Agentic AI on the basis of Five Concepts

The strategy of Sony Group for implementing Agentic AI is based on the following five concepts:

1. Democratizing agentic AI and promoting transformation into an AI-driven company: Concurrently driving widespread dissemination of technology and organizational transformation
2. Expanding the multi-cloud, multi-LLM concept: Utilizing diverse cloud services and LLMs
3. Developing protocols for incorporating leading internal and external AI agents: Building an ecosystem
4. Providing a platform for scaling up outstanding in-house models and AI technology: Ensuring scalability of technology
5. Enhancing templates to handle many use cases: Improving practicality

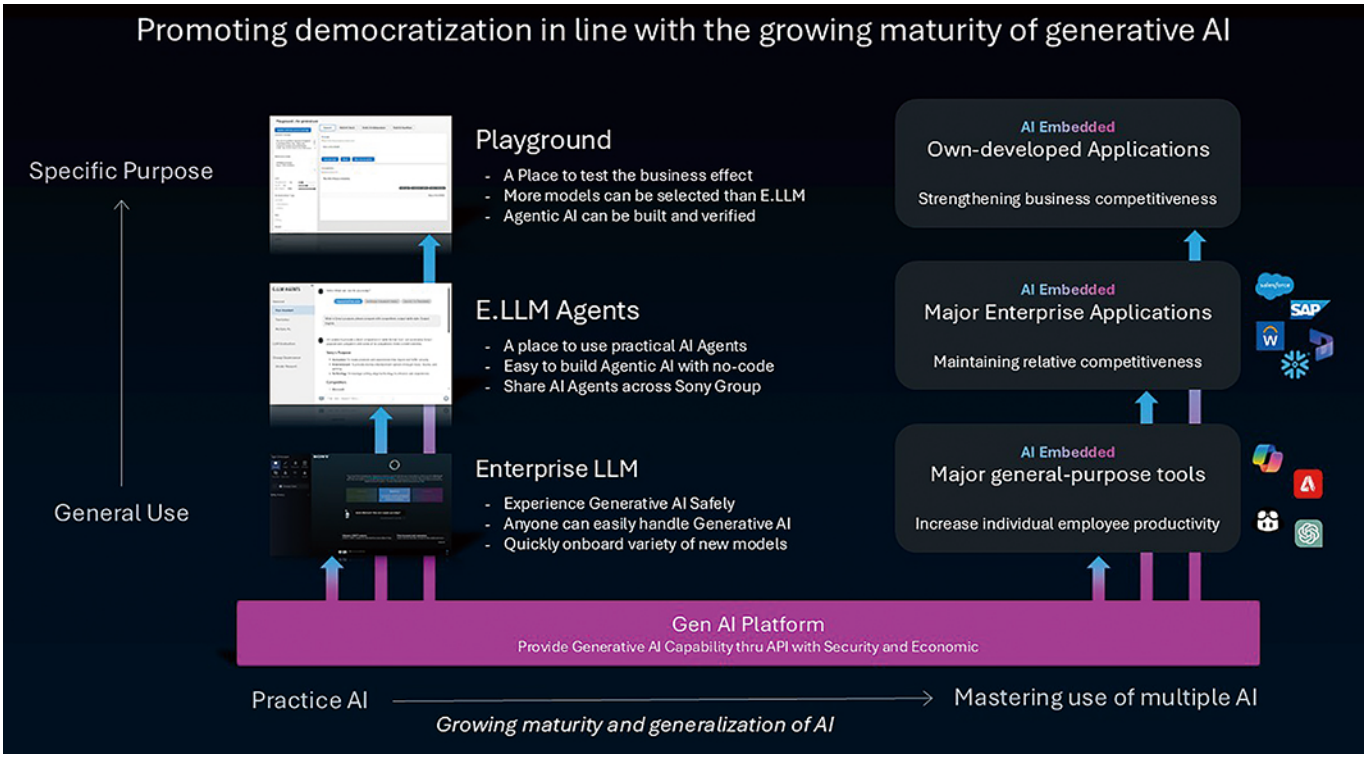
By implementing these concepts, we aim to unlock the full technical potential of agentic AI and accelerate the creation of business value.

6.5 Future prospects and challenges

Adoption of agentic AI is positioned as the next step in democratizing generative AI within the Sony Group. Future prospects and challenges concerning generative AI are summarized as follows:

1. Establishing a new model of human-AI collaboration: Exploring the optimal division of roles between AI agents and humans
2. Addressing organizational challenges associated with transformation of corporate structure: Redesigning existing business processes and organizational structures
3. Overcoming technical challenges: Balancing autonomy and safety, understanding complex tasks, and improving accuracy of task execution

Figure 8: Promoting democratization in line with the growing maturity of generative AI



4. Ethical and legal considerations: Clarifying accountability for autonomous AI behavior

To address these challenges, Sony Group is working not only on technological development but also on establishing governance frameworks and fostering talent and organizational culture. Through the adoption of agentic AI, we aim to realize our vision of "balancing creativity and productivity" at an even higher level and thereby accelerate our transformation into a truly AI-driven company.

7. Conclusion

Sony Group aims to achieve both creativity and productivity through the "democratization" of generative AI and its adaptation in business operations. As generative-AI technology rapidly evolves, the areas in which it can be used are expanding daily, and dozens and more use cases are currently emerging. From now onward, we will continue to create an environment in which engineers and business users can work together to explore new possibilities and to promote the democratization of generative AI while making full use of generative AI-related solutions such as Amazon Bedrock.

Cover Art

Chrysanthemum blossoming on Dangozaka Hill, Yanaka (Yanaka Dangozaka kiku) from A Hundred Views of Musashi Province

Woodblock prints depict famous landmarks in Tokyo.

Kobayashi Kiyochika (1847-1915)

Source: National Diet Library, NDL Image Bank (https://rnavi.ndl.go.jp/imagebank/)

Application of Generative AI for Advanced Network Operations at Fujitsu

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1. Introduction

- **Future vision of network operations**

In addition to features such as high speed and high capacity, low latency, and massive connectivity, networks are expected to provide low power consumption, high reliability, autonomy, and extendibility. We can also expect a variety of services to be provided via networks as a vital social infrastructure.

There is therefore a need for flexible networks that can support multi-vendor and diverse service formats in line with a shift toward open networks and virtualization. This high degree of freedom and flexibility in network operations, however, becomes a factor in making the operation and management of a network all the more difficult. To solve this problem, there is an urgent need for Zero-Touch-Operation (ZTO) that aims to reduce the burden on operators through the automation of network operations. Plans are now underway to introduce new technologies in ZTO including AI and generative AI.

Yet, to ensure reliable network operations as automation progresses, it is still important for experts to grasp and understand the state of operations and take appropriate action as needed. This approach is known as Human-In-The-Loop. However, as described above, the types of equipment accompanying multi-vendor operation and the types of operation processes for different services increase as the difficulty of network operations increases. Experts will therefore need to grasp an ever-increasing amount of information while becoming familiar with correct operational processes. In short, they will need to

- accumulate operational knowledge,
- analyze the current state and predict future conditions, and
- decide on countermeasures.

This means accumulating operational knowledge, performing analyses based on know-how, and taking appropriate operational measures. With this in mind, the need is felt for technology that would enable an operator to make efficient use of network operational knowledge.

- **Application of generative AI to network operations**

Generative AI has been rapidly attracting attention in recent years as a key technology for making efficient use of knowledge. It can generate documents by training on large amounts of data or by referencing storehouses of knowledge. In this way, generative AI can automatically provide appropriate answers to inquiries or questions posed by users as in chatbots.

In Japan, telecommunication companies are already providing customer services making active use of generative AI and developing related technologies. They are also beginning to develop original large language models (LLMs) and to provide user services based on those models. Fujitsu too is involved in a variety of initiatives such as providing its large language model called "Takane" in combination with Fujitsu proprietary technologies for using knowledge.

Figure 1: Conceptual diagram of advanced network operations using generative AI.

In the communications industry, much attention is being focused on the proactive use of generative AI in services for users such as chatbots. This article, however, introduces technology development related to generative AI and usage examples from the viewpoint of achieving advanced network operations. In this way, we aim to use knowledge in advanced network operations as shown in Figure 1.

Looking to the future, we can envision the use of generative AI throughout network operations, but in the following, we introduce problem solutions in network operations focusing, in particular, on failure response. The aim of the technologies introduced here is to ease the burden on network operators through advanced network operations by efficiently utilizing knowledge with generative AI.

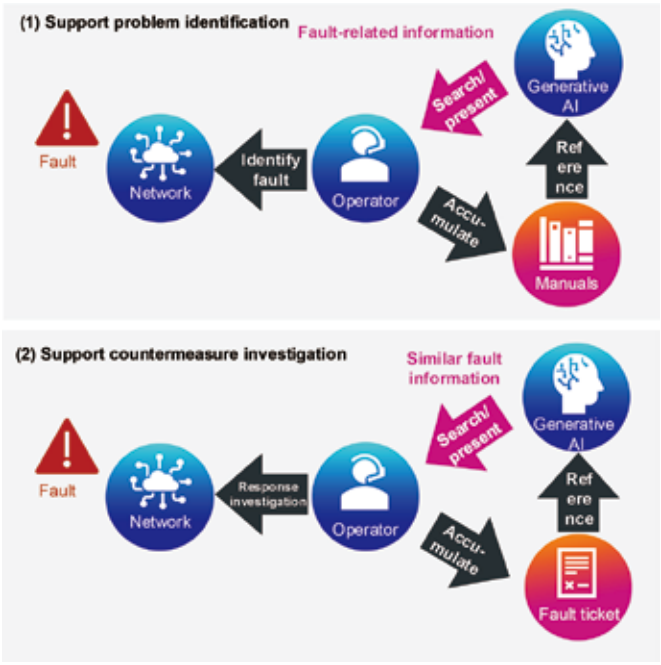
*1 Formerly kowns as Fujitsu Limited

2. Fujitsu's use of generative AI in network operations

In network operations, the use of knowledge is essential since quick action is needed particularly in failure response. For example, we can consider the following activities to take place in order to identify a problem and investigate countermeasures in response to a network failure.

- The operator searches for the knowledge needed to sort out the current situation and analyze the problem from manuals or specifications, and identifies the failure in this way.
- The operator then searches for a similar failure from past failure information and investigates causes and countermeasures while referencing the knowledge included on the failure ticket.

Figure 2: Conceptual diagram of failure response using generative AI.



In these activities, using generative AI that has been trained on a huge number of documents and past failure-related information would enable the operator to ask questions in natural language and quickly get hold of the information needed (Figure 2). In this way, generative AI has the potential of supporting an operator much like a brilliant assistant and contributing to efficient handling of network failures.

However, using generative AI requires documents for training purposes. In addition, the know-how essential to reliable network operation is wide-ranging that includes not only that during times of normal operation but also that at times of failures. Such know-how also differs according to the scale and complexity of the network. There is therefore a need to possess both:

- know-how of communications equipment/technologies of equipment vendors, and
- know-how of network design/operation of telecommunication carriers.

At the same time, it is often the case that documents like manuals and specifications are not in a format that generative AI can use for training.

Against the above background, Fujitsu has developed generative AI "Takane"*2 featuring enhanced Japanese-language proficiency for the Japanese market and full customization capabilities for using domain-specific knowledge. Takane is equipped with high-accuracy Retrieval-Augmented Generation (RAG) and is designed for use in a secure environment. Additionally, in conjunction with generative AI services like Takane, Fujitsu is developing data structuring technologies for structuring vast amounts of information as know-how into a format that enables efficient training of generative AI while ensuring the quality of that information as knowledge. This technology makes it possible to merge know-how of network communications equipment and network technologies cultivated by Fujitsu as a total vendor of network communications equipment and know-how of network design/operation of telecommunication carriers into the latest generative AI technology.

In addition to this technology, Fujitsu is developing technologies to enable know-how gained from training generative AI to be provided as knowledge that can be used by network operation managers. These include technology for analyzing the causes of failures and trends in countermeasures and performing cause-and-effect analysis and technology for improving the reliability of generative AI answers.

The following introduces such key technologies being developed by Fujitsu.

- **Accumulation of operational knowledge**

Training of generative AI requires large quantities of high-quality data. In documents that contain an accumulation of know-how and failure-related information in particular, such information will often be stored in a complicated manner. For example, multiple items of failure-related information may be mixed in the same document and some information may overlap different documents. Moreover, in addition to equipment manuals and text documents containing failure-related information, there are documents that contain a variety of data formats and file formats such as operation logs and time series data. Generative AI cannot be trained with these formats in their present state. Documents may also contain e-mail addresses and street addresses, and training generative AI with such information as-is raises ethical issues. Fujitsu is developing the following data structuring technologies to deal with these problems.

*2 Fujitsu has begun offering large language model "Takane" for corporate use having the highest Japanese language proficiency in the world.

- Data restructuring technology
  This technology extracts only necessary information from network-related documents (specifications, manuals, and failure-related information) in diverse formats, and structures that information into a format that can be used for training generative AI.
- Multimodal technology (tables, logs, images)
  This technology turns unstructured data like tables, logs, and images into documents and then structures that data into a format that can be used for training generative AI.

- **Analysis of current state and prediction of future conditions**

A network is configured in a complicated manner, so in operations management, the occurrence of a phenomenon must be judged not in a fragmentary manner but from a comprehensive point of view. Although generative AI must be trained while including, for example, the relationships between document content and failures that have occurred, there are few documents that explicitly describe such relationships.

To deal with these problems, Fujitsu has been developing the following analysis technologies.

- Fujitsu Knowledge Graph enhanced RAG for Root Cause Analysis
  This is Fujitsu's original technology for representing the relationships between diverse factors such as documents and symptoms and causes of multiple faults in graphical form to clarify the causal relationships among them*3 (released on Fujitsu AI platform "Kozuchi"*4).
- Trend analysis technology
  This technology analyzes and presents trends in causes and countermeasures with respect to past failure information in relation to a certain problem.

- **Countermeasure decision-making**

In network operations requiring high reliability, the role of generative AI is to support decision-making since final responsibility lies with the operator. However, AI including generative AI is essentially a black box that makes it difficult to judge whether its answers are correct. In addition, the way in which an operator poses a question may cause generative AI to misunderstand the operator's intent and return an inappropriate answer.

In response to these issues, Fujitsu has developed the following technologies for improving the reliability of answers.

- Query correction technology
  This technology converts inconsistencies, ambiguities, technical terms and abbreviations, and domain-specific phrases contained in operator questions into a form that makes it easy for generative AI to understand the operator's intent.
- Hallucination suppression technology
  This technology evaluates the likelihood of an answer returned from generative AI and presents the most likely answer.
- Evidence presentation technology
  This technology presents the data that serves as a basis for an answer returned by generative AI was generated.

3. Application examples

The technologies developed by Fujitsu are provided as "Virtuora AX Network Coach," a solution for achieving advanced network operations.

Figure 3: Document search screen in Virtuora AX Network Coach

- **Similar-failures search**

Case study: Making search for similar failures more efficient in operations management

When a failure occurs, determining whether it's an existing failure, a new failure, or a failure caused by the environment can result in many hours of primary troubleshooting in operations management.

In response to this problem, we conducted an application-effectiveness test using the "similar-failures search" function of

*3 Introducing Fujitsu Knowledge Graph Enhanced RAG (4 sessions) #1 Fujitsu Knowledge Graph Enhanced RAG for RCA (Root Cause Analysis)
*4 Fujitsu releases advanced AI technologies through it's "Fujitsu Kozuchi (code name) - Fujitsu AI Platform" to accelerate the implementation of an AI society toward a sustainable world.

this solution. Specifically, we constructed a database for use in generative AI training from failure management information that manages past failures. We also designed a mechanism that, on the occurrence of a certain failure, can search for similar failures from past problem management information by simply inputting a description of that failure into this solution in natural language.

This test used failure-processing information targeting Fujitsu equipment as training data. We performed an evaluation using three items—response rate, correct answer rate, and primary troubleshooting time—as indices for verifying application effectiveness.

Table 1: Results of evaluating application of similar-failures search
(Below are the results obtained in this test.)

Item	Result
Response rate	Could present information even for questions about failures that do not exactly match the keywords and could return answers with information enabling a failure/non-failure judgment. Response rate was therefore 100%.
Correct answer rate	Could generally respond with similar failures with a correct answer rate greater than 80%. In particular, for frequently appearing failures that are difficult to judge from the ticket title, similar failures could be identified by asking additional questions.
Primary troubleshooting time	Could generally shorten search time compared with conventional keyword searches. In particular, for alarm-type failures for which related tickets exist in vast quantities, search time could be shortened to 1/10 or more.

In the past, after receiving the results of searching failure-processing information, it was necessary to open up one ticket for each failure and check the analysis of that failure described in lengthy sentences. This solution, in contrast, presents information summarized by generative AI, so it has the effect of significantly reducing the amount of text that needs to be checked and making primary work at the time of a failure occurrence more efficient.

- **Document search**

Case study: Making manual searching more efficient

A network system uses equipment from a number of vendors. Each piece of this equipment features complex functions and option settings, so to operate such equipment, a large number of complicated manuals must be checked and understood.

Equipment manuals, however, contain expressions and terminology unique to each type of equipment, which require skills and time to understand. The knowledge of specific equipment and functions may also be biased depending on the operator. Additionally, when implementing new equipment and functions, they, of course, need to be understood, but localization is also required to handle multilingual manuals.

In response to these problems, we conducted an effectiveness test using the "document search" function of this solution (Fig. 3). For this test, we constructed a database for use by generative AI from specifications and manuals of Fujitsu equipment. We also designed a mechanism that enables a user to search for desired information, such as how to use a certain piece of equipment, from a massive number of manuals by inputting questions into this solution using natural language.

We performed an evaluation using four items—consistency, accuracy, context, and response time—as indices for verifying application effectiveness.

Table 2: Results of evaluating application of document search

Item	Result
Consistency	Able to respond to questions mixed with abbreviations, Japanese and English expressions, etc.
Accuracy	Able to return answers that grasp the questioner's intent from ambiguous expressions. Could also return answers with respect to unstructured data (figures and tables), and would return "Unable to answer" for content not contained in documents thereby preventing hallucinations and guaranteeing accuracy.
Context	Able to reply in logical, natural Japanese with few grammatical errors.
Response time	Able to return answers generally within 30 seconds enabling stress-free use.

In the past, it was necessary to check the table of contents in many documents to look for a chapter that may be relevant to the information needed, or keywords had to be correctly input to conduct a search. This solution, however, lists out the information relevant to the questioner's intent as determined by generative AI, which makes it possible to list the information needed from a large quantity of documents in a short time.

4. Conclusion

From here on, we can expect advancements to be made in "advanced decision-making" and "autonomous operations" applying AI and "digital rehearsals" based on digital twins. Going forward, Fujitsu plans to expand the application of generative AI and provide solutions that leverage new technologies such as AI agents with a view to more advanced network operations.

Promoting the Use of Generative AI and OKI's Innovation Support System

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1. Introduction

Generative AI, exemplified by large language models (LLMs), has the potential to drive revolutionary changes in business processes and product development due to its powerful knowledge-generation capabilities and wide range of applications. It is drawing significant attention as a technology that can enhance operational efficiency and create new value.

This article outlines the foundational infrastructure and usage guidelines OKI has established for leveraging generative AI across the Group. It then provides an overview of OKI's internal initiatives to promote AI adoption, highlighting specific examples, particularly efforts around idea generation and innovation, which are key areas of focus for the OKI Group. Finally, it introduces the "Da Vinci Graph™" (trademark pending), a proprietary innovation support system, along with case studies demonstrating its use.

2. OKI's common platform for generative AI use

2.1. Background

The OKI Group aims to make generative AI accessible for use by all employees, leveraging its innovative capabilities to enhance operational efficiency and strengthen competitiveness. Promoting the adoption of generative AI requires the establishment of a secure environment where employees can confidently apply it in their daily work.

In November 2022, OpenAI released ChatGPT®*1, which gained over 100 million users within just two months, drawing widespread public attention. Responding to this momentum, the OKI Group recognized the transformative potential of generative AI and began exploring its use for improving work processes and fostering innovation. While the need for active utilization became increasingly clear, concerns also emerged regarding the use of public generative AI services. In particular, two risks were identified: the risk of data leakage, due to input data being used for further model training, and the risk of hallucinations, where the AI outputs incorrect or misleading information. Recognizing these risks, OKI determined that building a secure AI infrastructure is an urgent priority to ensure the safe and effective use of generative AI in business operations.

To address this issue, the OKI Group launched the "OKI AI Chat System", an internal platform that enables secure use of generative AI while maintaining data security and information quality (see Figure 1). To further promote adoption, OKI has also

Figure 1: Interface of the OKI AI Chat System

*1 ChatGPT is a registered trademark of OpenAI.
*2 GPT is a registered trademark of OpenAI.
*3 Azure is a registered trademark of the Microsoft group of companies.

actively developed usage guidelines and implemented internal utilization and support measures, creating an environment where all employees can harness the full value of generative AI.

2.2 Building a secure AI platform

Four key considerations were taken into account in constructing the platform. Leveraging this infrastructure ensures the safe use of generative AI in business operations while also keeping pace with subsequent GPT*2 model updates.

1. Use of Microsoft Azure*3, a cloud platform with a proven track record within the company
2. Restricted access to internal networks only, blocking all external connections
3. Protection of internal data by opting out of model training to ensure that input data (i.e., internal company data) is not used for learning purposes
4. No storage of chat history with the generative AI system, thereby avoiding unintended information leaks

2.3 Establishing usage guidelines

While generative AI offers innovative capabilities and can be applied to a wide range of use cases, it also brings ethical and societal risks. Therefore, alongside technological development, it is crucial to establish clear rules and guidelines. To ensure safe and secure usage, OKI has developed the "OKI AI Chat System Usage Guidelines." These guidelines outline the rules for using generative AI in general and aim to enable employees to apply the technology appropriately in their work.

Key points of the guidelines

1. Standardized system usage

For business purposes, employees are encouraged to use the secure "OKI AI Chat System." As a general rule, the use of public generative AI services is discouraged unless there is a specific reason.

2. Input data rules

General business information may be entered into the system; however, the input of highly confidential information, personal data, or content that could infringe on rights is strictly prohibited. The handling of confidential information must follow the internal rules of the relevant department and be strictly managed.

3. Output usage rules

Given the risks of misinformation (hallucinations) and potential rights infringement, the direct use of generative AI outputs in external documents or deliverables is prohibited. All content must be reviewed and revised as necessary by a responsible party. Additionally, using the system for the purpose of collecting personal information is not allowed.

3. Promoting internal use of generative AI

The OKI Group is advancing internal generative AI initiatives along two main axes:

1. Education and awareness-raising on generative AI
2. Promotion of proof-of-concept (PoC) activities using generative AI

3.1 Education and awareness-raising on generative AI

In addition to building the generative AI infrastructure and establishing usage guidelines, OKI is working to enhance overall employee understanding and skill levels through internal education and awareness activities. For beginners, the company provides seminars and e-learning sessions aimed at improving AI literacy and promoting adoption of the OKI AI Chat System, while also organizing roundtable discussions with internal experts to facilitate information sharing. Moreover, a mandatory training program titled "Generative AI User Education" is being implemented starting August 2024 to ensure employees understand the appropriate norms and methods for using generative AI.

For intermediate users, OKI offers group training, hands-on workshops, and AI community-of-practice (CoP)–style applied learning sessions to help strengthen practical skills. A community site has also been launched to encourage knowledge sharing, with over 1,000 active users participating. In addition, the company hosts AI "ideathons" to gather employee ideas and further broaden AI usage across the organization.

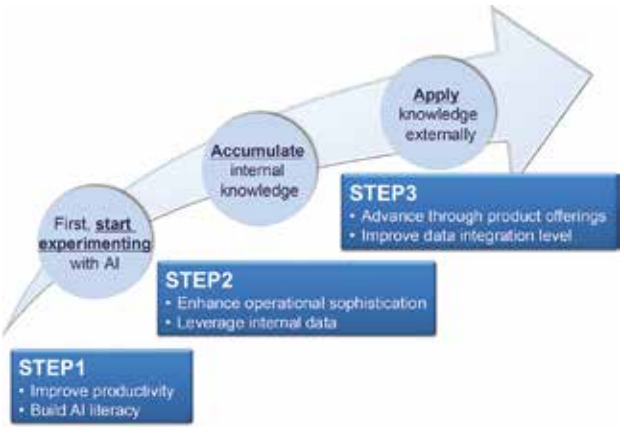
3.2 Promoting PoC activities using generative AI

This section outlines specific initiatives within the OKI Group to apply generative AI in practice. These efforts are being carried out as part of a broader internal promotion strategy and are implemented in three main phases (see Figure 2).

● Step 1: Getting started with AI utilization

In Step 1, the primary goals are to enhance productivity through the actual use of generative AI and to improve user

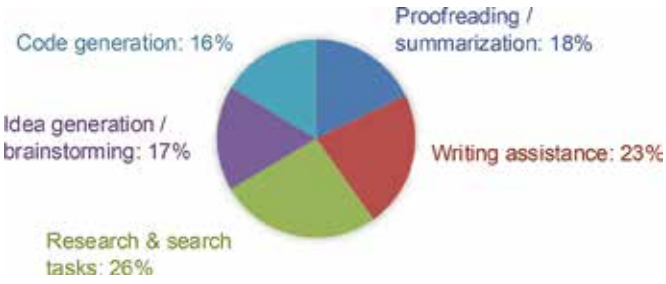
Figure 2: Steps for AI utilization



literacy and familiarity with basic usage methods.

A user survey conducted at this stage revealed that generative AI was being used in a wide range of scenarios without being limited to any specific use case (see Figure 3). Among the most impactful applications were automatic proofreading, summarization, and assistance with document creation. Use at the individual level has expanded to include summarizing meeting minutes, drafting emails, translation, and document review. One concrete example involved automatically summarizing system error messages and drafting related emails to relevant departments—a task that previously took several tens of minutes but was completed in just a few minutes using AI, demonstrating significant productivity enhancement. In another case, AI was used to generate code for simple RPA tools, resulting in a reported 90% reduction in workload. These examples highlight how generative AI can drive automation even in areas traditionally dominated by manual tasks. They underscore the versatility of generative AI and substantiate the importance of introducing it across a wide variety of use cases from the outset.

Figure 3: Distribution of use cases



● Step 2: Accumulating internal knowledge

In Step 2, the goal is to enhance and streamline operations by developing individual PoC systems tailored to specific business challenges and organizational needs. By leveraging Retrieval-Augmented Generation (RAG) technology, generative AI can be integrated with internal data to produce more accurate responses and insights.

Approximately two to three months after the internal release of the OKI AI Chat system, there was a noticeable increase in requests from various departments to explore generative AI use. For use cases deemed sufficiently impactful and feasible, the AI utilization promotion team began working collaboratively with the relevant departments to implement AI-PoC initiatives aimed at solving their specific challenges.

One concrete example involves improving efficiency in customer inquiry operations. By using RAG to allow generative AI to search past inquiry data, departments were able to generate responses that reflected their internal know-how. This enabled fast and accurate handling of frequently asked questions. A similar approach was applied in manufacturing sites, where generative AI used historical equipment-related inquiry data to automatically answer common field questions, thereby improving operational efficiency. By automating the entire inquiry-handling process, the system reduces the workload on employees while enabling faster response times for those making inquiries.

Another example of advanced use involves applying generative AI to well-known business frameworks such as 3C analysis and PEST analysis, commonly used for business strategy planning. Incorporating AI into these frameworks supports more sophisticated root cause analysis and issue identification, enabling greater value creation through improved efficiency.

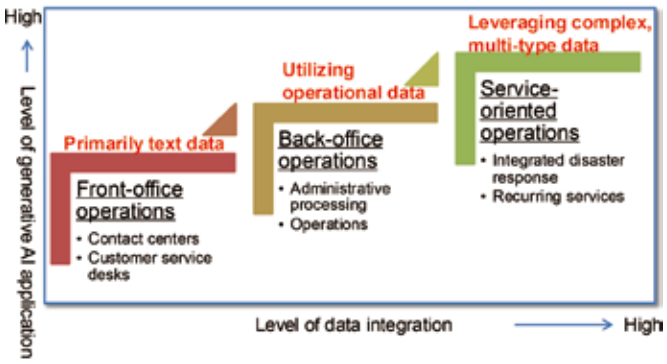
● Step 3: Applying internal knowledge externally

In Step 3, the OKI Group is working to implement generative AI within its business domains to enhance products and services aimed at external clients.

OKI has significantly expanded its business areas around front-office operations, particularly in contact centers and customer service functions. These areas align well with the strong suits of generative AI. Therefore, OKI has been proactively exploring the early adoption and implementation of generative AI internally to leverage its strengths as a company. A wide range of benefits are expected, including quicker solution proposals by operators, automatic generation of reports and FAQs based on conversation logs, and improved operator quality through feedback.

Furthermore, solving more advanced business and service challenges requires not only generative AI technologies, but also robust data integration. It is essential to leverage various types of operational data, integrate them, and input them appropriately into the AI system. By placing generative AI at the core and enhancing the level of data integration, OKI aims to drive greater value creation across its business operations (see Figure 4).

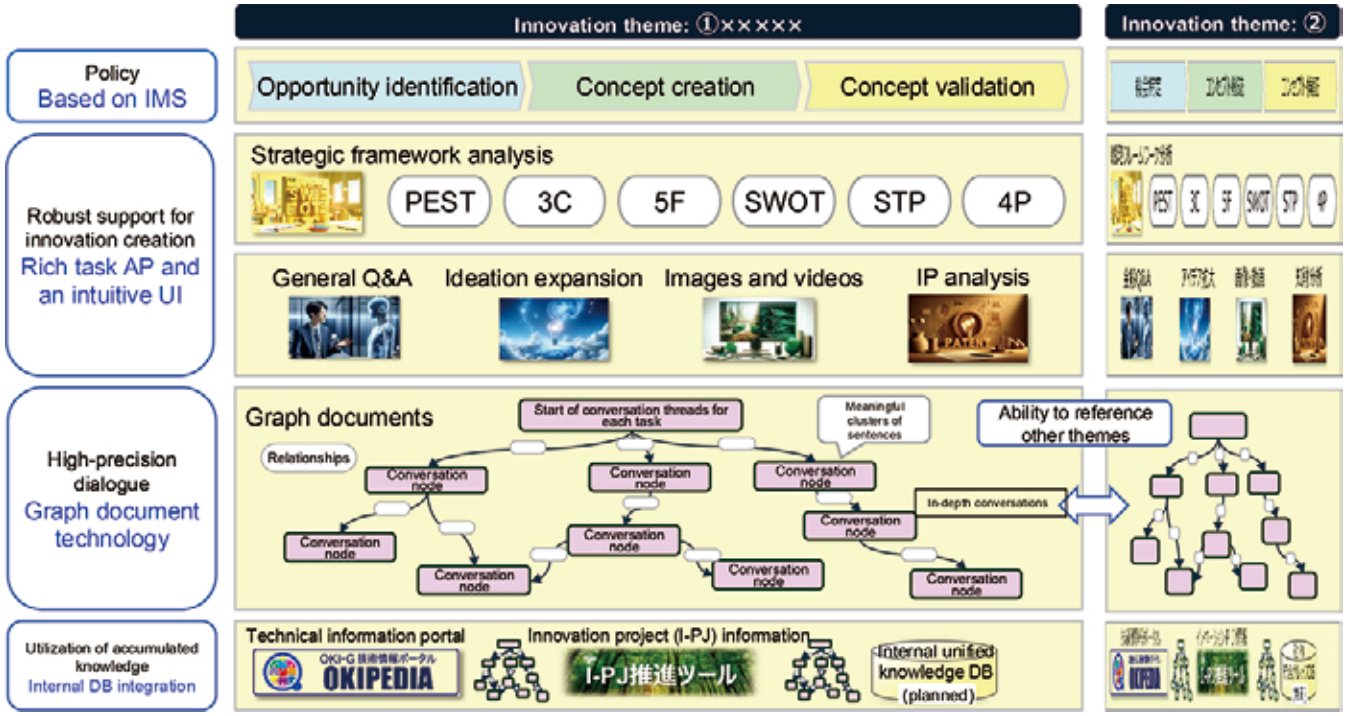
Figure 4: Long-term roadmap for external application



4. Generative AI application specialized in innovation creation

At OKI, we promote the generation of innovation ideas by

■ **Figure 5: Overview of the innovation support system**



each and every employee[1], and to support this, we have developed a generative AI–powered innovation support system called Da Vinci Graph™.

One of the system's key features is the integration of generative AI with graph document technology.

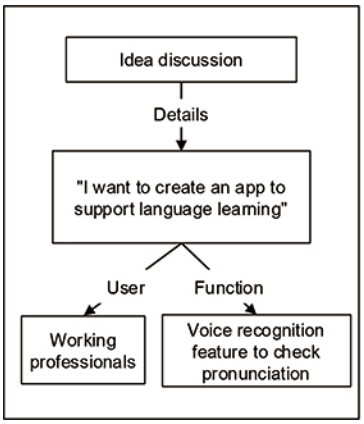
A graph document is a network-structured document in which words or sentences are represented as nodes, and the semantic relationships between them are expressed as edges, as shown in Figure 6.

Because the semantic connections between nodes are explicitly defined, graph documents encourage logical thinking[2]. In this system, the ideation and discussion process conducted via interaction with the generative AI is simultaneously visualized as a graph document, helping users organize and structure their thoughts more effectively.

Furthermore, this system is designed based on the Innovation Management System (IMS), enabling dialogue from various perspectives for each innovation theme. Dedicated prompts are prepared for each task, allowing employees to engage with the system and explore ideas in greater depth from the perspective of each task.

As mentioned earlier, the results of these dialogues are continuously displayed and stored as graph documents. When engaging in a new task, the generative AI receives the current

■ **Figure 6: Example of a graph document and its data structure**




```
{
  "nodes": {
    {"id": "1", "content": "Idea discussion"},
    {"id": "2", "content": "I want to create an app to support language learning"},
    {"id": "3", "content": "Working professionals"},
    {"id": "4", "content": "Voice recognition feature to check pronunciation"}
  },
  "edges": {
    {"source": "1", "target": "2", "label": "Details"},
    {"source": "2", "target": "3", "label": "User"},
    {"source": "2", "target": "4", "label": "Function"}
  }
}
```

Figure 7: Dialogue by task and continuously updated graph documents

graph document for that theme, so it can incorporate the results of previous tasks into the ongoing conversation. Users can also view and edit the resulting graph documents.

In addition, users can reference themes from other projects or from their colleagues, enabling the use of accumulated internal knowledge and supporting further acceleration and expansion of innovation.

Currently, as part of a pilot trial, the system is being tested by selected participants in an internal generative AI contest. In this contest, users are challenged to create a Business Model Canvas (BMC) using the system. The BMC is a framework that visualizes how a product or service delivers value and generates revenue. The system supports cross-functional analysis using frameworks like PEST, 3C, and SWOT, allowing users to construct a BMC based on those insights. Feedback gathered from participants during the contest will be used to further enhance the system's functionality.

5. Conclusion and future outlook

This paper introduced the OKI Group's generative AI utilization framework, internal use cases, and the innovation support system Da Vinci Graph™.

These initiatives have contributed to the widespread adoption of generative AI within the organization. As of March 2025, approximately 5,000 employees are actively using the OKI AI Chat System.

Looking ahead, we believe it will be essential not only to stay abreast of the latest technological developments, but also to continuously monitor and respond swiftly to the evolving landscape of AI regulations and usage guidelines being established around the world.

Building on internal use cases, OKI is also considering proposals for integrated solutions leveraging the OKI AI Chat System, as well as the commercialization of Da Vinci Graph™, which is currently in pilot testing. These efforts aim to expand offerings to external clients and grow OKI's generative AI solutions beyond the organization.

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Measurement of RF-EMF levels around 5G Mobile Phone Base Stations

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1. Introduction

Radiofrequency electromagnetic field (RF-EMF) used by broadcasting systems, mobile phone systems including the fifth-generation mobile communication system (5G), wireless LAN equipment, etc. that are used all around us is applied within a range that does not adversely affect the human body based on the Radio Protection Guidelines[1]. However, RF-EMF, though omnipresent in our world, are nevertheless invisible, and since new technologies and frequency bands are being used in 5G, some people are voicing concerns about RF-EMF exposure not only overseas but in Japan as well. Against this background, information on mobile phone base-station antennas and results of EMF exposure level monitoring have been released overseas on websites and elsewhere[2–4]. Furthermore, in Europe, two projects were launched in 2022 as part of Horizon Europe[5] research funding programs: SEAWave (Scientific-Based Exposure and Risk Assessment of Radiofrequency and mm-Wave Systems from children to elderly (5G and Beyond))[6] and GOLIAT (5G expOsure, causaL effects, and rIsk perception through citizen engAgemenT)[7]. Each of these projects is divided into several work packages reflecting research in EMF exposure monitoring, risk communication, etc.

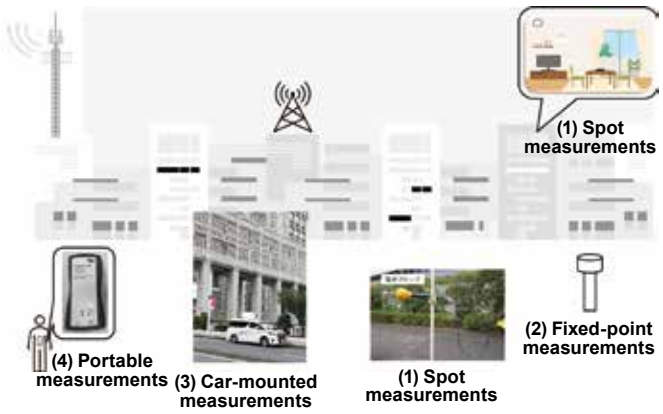
Meanwhile, in Japan, the "Strategic Research Study Group on Biological Electromagnetic Environments" of the Ministry of Internal Affairs and Communications (MIC) studied ways of conducting medium- to long-term research on the safety of EMF exposure and compiled a report in 2018 containing specific research directions for each research technique and a medium- to long-term roadmap up to 2040.[8]. In relation to research on risk communication, this report called for comprehensive measurements of EMF levels from diverse sources, long-term accumulation of that data, and widespread sharing of information on EMF exposure levels. In response to these needs, the National Institute of Information and Communications Technology (NICT) began research in FY2019 on the acquisition, accumulation, and application of EMF exposure monitoring data as Japan's only public research organization specializing in the field of information and communications. The purpose of this research was mainly to clarify fully the EMF environment in our daily lives and to present ways of risk communication to enable appropriate explanations and conversation on potential risks as the use of EMF further develops and expands[9].

At NICT, we have been making measurements outdoors or in underground shopping malls of EMF from mobile phone base stations, outdoor measurements of EMF from broadcast transmitting stations, and measurements of EMF from mobile phone base stations, terminals, and broadcast transmitting stations inside residences and classrooms. Among these, this article introduces the results of measuring EMF exposure levels around 5G mobile phone base stations.

2. Overview of measurements

Monitoring techniques for obtaining a comprehensive understanding of EMF exposure levels in real-world environments can be broadly divided into (1) spot measurements, (2) fixed-point measurements, (3) car-mounted measurements, and (4) portable measurements as shown in Figure 1. (1) Spot measurements refer to temporary measurements that can be performed at any measurement point. While they enable flexible measurement conditions to be set, they are limitations in terms of a broad range of measurements due to constraints in human resources. (2) Fixed-point measurements, meanwhile, are able to determine trends in the temporal change of EMF exposure levels by fixing a location and performing continuous, long-term measurements. Next, (3) car-mounted measurements mean performing measurements while driving a vehicle mounted with measuring equipment. As such, this technique cannot obtain temporal changes in EMF exposure levels at individual points, but it is capable of efficiently determining a spatial distribution of EMF over a wide range. Finally, (4) portable measurements refer to a technique whereby an individual performs measurements while carrying around a small measuring device. In this way, an individual can continuously

Figure 1: Overview of monitoring techniques[9]



observe actual levels of personal EMF exposure. This type of measurement is called a "microenvironment measurement." Each of the above techniques has its features and limitations, but using them in a combined and complementary manner can suppress bias in the data and enable the acquisition of large-scale and detailed EMF exposure level data.

In the early stage of 5G introduction, there was practically no EMF exposure level data with respect to 5G in real-world environments. Consequently, as described here, we performed spot measurements in the latter half of FY2022 with the aim of understanding in detail EMF exposure levels around 5G mobile phone base stations. The frequency bands targeted by these measurements are listed in Table 1. Since 5G adopts the Time Division Duplex (TDD) system, it uses the same frequency band in transmissions from a mobile phone terminal to a base station (uplink) and in transmissions from a base station to a terminal (downlink). This makes it difficult to clearly distinguish uplink and downlink signals, but since there is a high proportion of downlink signals in the frequency band of a TDD system, measurement results were evaluated as radio signals transmitted from a mobile phone base station. In recent years, moreover, frequency bands that had so far been allocated to the existing fourth-generation mobile communication system (4G) came to be approved for use by the 5G system[10] and some of them are already in operation. This article, however, targets the newly allocated 3.7 GHz and 4.5 GHz bands in Frequency Range 1 (FR1) and 28 GHz band in Frequency Range 2 (FR2) as frequency bands that better reflect the unique characteristics of 5G (Table 1). For the 28 GHz band, in particular, there are almost no examples of actual measurements even from an international perspective, so the results of the measurements presented here should be especially significant as base data for future studies.

For measurements in each of the FR1 and FR2 bands, we targeted RF-EMF levels around commercially operated base stations and performed these measurements at 51 points in Tokyo and its suburbs[11] and at 3 locations in central Tokyo[12]. For FR2, there was only a limited number of such base stations in operation at the time of these measurements, so we performed the measurements at 5 different points around each base station. For the FR1 measurements, we used a spectrum analyzer (Anritsu MS2090A) and a tri-axis isotropic antenna (Anritsu 2000-1791-R) that can be used up to 6 GHz, and for the FR2 measurements, we used an antenna supporting the 28 GHz band instead of the tri-axis isotropic antenna[12]. Additionally, to realistically evaluate RF-EMF levels around base stations in actual communication environments, we measured electric field (E-field) strength while downloading to a mobile phone terminal 6.6 GB and 10 GB of data in FR1 and FR2, respectively. Furthermore, though there were also transmissions from the terminal to the base station (uplink) during a download, we made an effort to evaluate as many downlink signals as possible from the base station so as to minimize the effects of those uplink signals on measurement results.

Moreover, to minimize effects of the measurer's body, we fixed the electric field probe or antenna to a jig made of fiber reinforced plastics (FRP) and connected the spectrum analyzer by cable. In FR2 measurements, we scanned in the vertical direction at each measurement point to make measurements at specific heights (see Figures 2 and 3) in compliance with MIC's Bulletin No. 300[13] of 1999. Specifically, we moved the antenna from a ground height of 0.1 m to 2 m at intervals of 0.1 m and measured E-field strength at each height, and at maximum height, we performed a measurement continuously for a period of one minute. On the other hand, we set the FR1 measurement height to 1.5 m based on Ref.[14]. Here, taking the resolution bandwidth (RBW) and video bandwidth (VBW) to be 1 MHz and 3 MHz, respectively, we

Table 1: Target frequencies

Name	Frequency Band [GHz]
3.7 GHz band (FR1)	3.6–4.1
4.5 GHz band (FR1)	4.5–4.6
28 GHz band (FR2)	27.0–29.5

Figure 2: Measurement overview

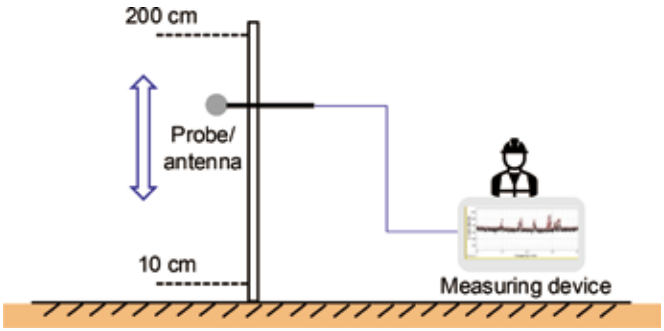
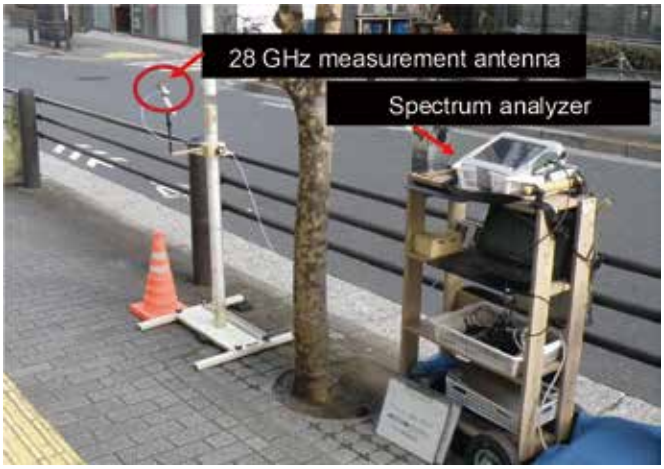


Figure 3: FR2 measurement scene[15]

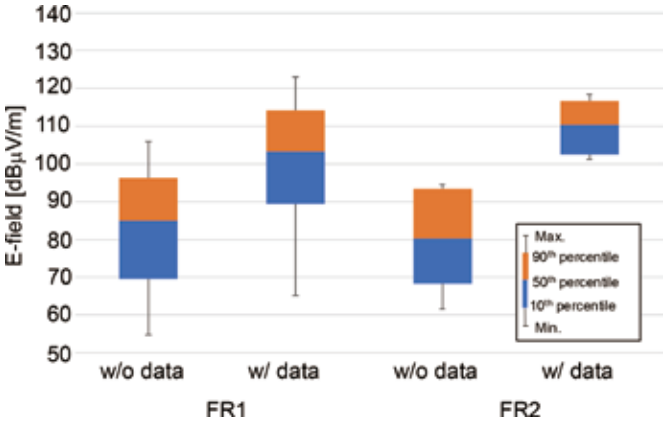


calculated the effective square root of the sum of squares of E-field strength in each band[12]. On making these calculations for each band, we excluded any values under a previously set threshold (noise floor).

3. Measurement results

Measurement results for FR1 and FR2 E-field strength [dBμV/m] are shown in Figure 4 in the form of a box and whisker plot. Here, 120 dBμV/m corresponds to 1 V/m. In the figure, "w/data" denotes that measurements were performed while downloading data to a mobile phone terminal placed near the measuring device, while "w/o data" denotes measurements without any downloading. Under the w/data condition, results showed that the median value of E-field strength tended to be 20–30 dB higher than that of w/o data. In the 28 GHz band, results for w/data showed that the median value of E-field strength was approximately 7 dB greater than that in the sub-6 GHz bands with a statistically significant difference (t-test $p < 0.0001$). On the other hand, the E-field strength value prescribed in Radio Protection Guidelines for each 5G frequency band (FR1, FR2) is 155.76 dBμV/m (61.4 V/m)[1], so it can be seen that the median value of measured E-field strength is more than 40 dB lower than the guideline value (less than 1/10,000). In addition, the 5G E-field strength measured here was found to be equivalent to or lower than that of 4G measurement results[11, 12].

Figure 4: E-field strength around 5G base stations[11, 12]



4. Conclusion

This article introduced the results of measuring base station EMF levels in a 5G mobile communication system under commercial operation in Japan. Up to now, while some examples of 5G-related measurements could be found here and there, these results represent the world's first case of measuring and announcing EMF strength around 5G FR2 base stations in commercial service by a public research organization from a neutral position.

On making these measurements for the two frequency bands used by 5G (sub-6 GHz and 28 GHz bands), it was found that E-field strength was at a level equivalent to or lower than that of the existing mobile phone system (4G) and lower than the recommended value in Radio Protection Guidelines. Going forward, with a view to the further penetration of 5G, NICT plans to achieve a long-term and large-scale understanding and data acquisition of EMF exposure levels in real-world environments in Japan through long-term fixed-point measurements, wide-area monitoring, etc.

Acknowledgments

This work was partially conducted under the project "Bioelectromagnetic Environment Research and Evaluation Technology Research on Radio Wave Safety" of the Ministry of Internal Affairs and Communications (JPMI10001), Japan.

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GPAI Tokyo Innovation Workshop 2025: Results Summary

GPAI Tokyo Expert Support Center

1. Establishment of GPAI Tokyo Expert Support Center

The Global Partnership on Artificial Intelligence (GPAI) is an integrated partnership that brings together OECD members and GPAI countries to advance an ambitious agenda for implementing human-centric, safe, secure, and trustworthy artificial intelligence (AI) embodied in the principles of the OECD Recommendation on AI.

GPAI was launched in June 2020, following the G7 Summit declarations in 2019 and 2020. Japan has participated since its inception and hosted the GPAI Summit in Tokyo in November 2022. Furthermore, in October 2023, G7 leaders issued the G7 Leaders' Statement on the Hiroshima AI Process, welcoming the Hiroshima Process International Guiding Principles for Organizations Developing Advanced AI Systems and the Hiroshima Process International Code of Conduct for Organizations Developing Advanced AI Systems. They also called on relevant ministers to further strengthen project-based cooperation with GPAI and other organizations.

In response, the Japanese government proposed at the GPAI Ministerial Council in India (December 2023) to establish the third GPAI Expert Support Center in Tokyo, following Paris (France) and Montreal (Canada), to support research aligned with these international principles and codes of conduct, and to promote projects that provide evidence for policy development on generative AI. This proposal was approved, and the GPAI Tokyo Expert Support Center (hereinafter "Tokyo Center") was established within the National Institute of Information and Communications Technology (NICT) on July 1, 2024.

2. Background of the Tokyo Innovation Workshop

GPAI develops an annual work plan defining its activities for the year. In the 2025 plan, the "Tokyo Innovation Workshop" (Tokyo IW) was designated as a GPAI-associated project to be organized by the Tokyo Center in collaboration with two other centers.

The "Innovation Workshop" (IW) series has been held annually since 2023 (Canada, 2023; France, 2024) to foster synergy and innovation among multi-stakeholders. Its goals are to enable direct exchanges between global AI experts and GPAI member governments, identify key challenges in AI development, and explore potential solutions.

The Tokyo IW was held on May 28-29, 2025, at the NICT Innovation Center (Nihonbashi). Based on pre-event surveys of experts and stakeholders, the themes were set as "AI Utilization in the Global South and Strengthening of Domestic and Global AI Ecosystems," "Interoperability of International AI Governance Frameworks," "Multilingual and Multicultural AI," and "Open Source AI." The workshop sought to facilitate comprehensive and forward-looking discussions on future project formation and the broader future of AI.

3. Preparation for the Tokyo IW

The Tokyo IW was co-hosted by NICT, CEIMIA, and Inria, with support from the OECD. As the first GPAI-associated project organized by the Tokyo Center, preparation was carried out in close collaboration with CEIMIA and Inria, which had hosted previous innovation workshops.

The event was also supported by Japan's Ministry of Internal Affairs and Communications (MIC), which leads national AI policy, and the Japan International Cooperation Agency (JICA), which supports AI strategy development in emerging countries.

The Tokyo IW was successfully held with participation from a wide range of multi-stakeholders, including government agencies and AI researchers from both GPAI and non-GPAI member countries.

4. Results of the Tokyo IW

(1) Meeting Overview

The workshop brought together over 170 participants from 41 countries. This diverse gathering included GPAI and OECD experts, as well as representatives from government agencies, international organizations, academia, the private sector, and non-profit organizations. There was significant participation from both GPAI member and non-member countries. Of these, 137 participants from 36 countries attended in person. Participants were most numerous from Asia (41%), followed by Europe (26%), North America (13%), and Africa (12%). By affiliation, government agencies (44%) formed the largest group, but there was balanced participation from academia, international organizations, private companies, and non-profit organizations.

(2) Program

Opening Ceremony (May 28)

Following the opening declaration by GPAI Tokyo Center Secretary-General, Yuko Harayama, host remarks were delivered by NICT President Hideyuki Tokuda, and guest remarks by Takuo Imagawa, Vice-Minister for Policy Coordination at the Ministry of Internal Affairs and Communications. This was followed by a keynote speech by Hiroaki Kitano (Technology Fellow, Sony Group Chief) and panel discussions moderated on the four themes.

Group Discussions (May 28)

The discussions were organized around four themes: "AI

Figure 1: NICT President Hideyuki Tokuda delivering host remarks

Figure 2: Panel Discussion

Utilization in the Global South and Strengthening of Domestic and Global AI Ecosystems," "Interoperability of International AI Governance Frameworks," "Multilingual and Multicultural AI," and "Open Source AI". Participants were divided into 12 groups across these themes, and each group presented a summary of its findings.

Reception (May 28)

On behalf of the Japanese government, State Minister for Internal Affairs and Communications Masashi Adachi delivered guest remarks. Exhibitions and presentations were also held by Japanese AI-related private companies, including Amazon Web Services Japan G.K., Fujitsu, KADOKAWA ASCII Research Labs, KDDI, Konica Minolta, Microsoft Japan, and TOPPAN Digital.

Theme-based Discussions (May 29)

Discussions were held by theme to consolidate opinions, after which all participants gathered for final reports by theme.

Wrap-up and Closing Ceremony (May 29)

A panel discussion titled "The Future of GPAI" was held, featuring GPAI Co-Chair Uroš Poluga; Karine Perset, Acting Head of the OECD AI and Emerging Digital Technologies Division; Albina Ovcearenco, Head of the Digital Development Unit at the Council of Europe; and Lydia Lamisi Akanvariba, Minister of State of Ghana (APNIG: African Parliamentary Internet Governance Network Committee).

Following this, representatives from the three centers reported the results of the group discussions. The three center directors, joined by OECD Acting Head of Division Karine Perset, then presented the key takeaways from the workshop. Finally, NICT President Hideyuki Tokuda concluded the Tokyo IW with closing remarks.

(3) Key Points from Group Discussion Results

The results of group discussions, summarized below, were reported at the GPAI Plenary held in June this year. They are expected to be reflected in future GPAI activities and policy recommendations.

"AI Utilization in the Global South and Strengthening of Domestic and Global AI Ecosystems" Group

This project proposed the establishment of "AI Living Labs for Impact" (laboratories for demonstrating AI with social impact).

As AI technology development has largely advanced in developed countries, inequality in AI usage is widening, leading to discussions about the need to strengthen AI ecosystems in Global South countries. The result was the proposal to establish AI Living Labs to collect and share good practices in data, use cases, and observation methods, enabling all stakeholders to participate and learn.

"Interoperability of International AI Governance Frameworks" Group

As a result of discussions, the development of "Dynamic Mapping of AI Governance Frameworks" and "Building Interoperability among Policy Frameworks to Promote Data and Input/Output Utilization for AI Innovation" were proposed.

Regarding the former, numerous working maps have been developed based on high-level frameworks such as OECD principles, the US NIST AI Risk Management Framework (RMF), ISO/IEC standards, EU Codes of Practice, and the Hiroshima AI Process. However, field practitioners still face

challenges in identifying commonalities and differences among multiple frameworks, and in preventing conflicts between them. Against this background, to coordinate domestic and international AI policy frameworks, cross-mapping of detailed activity items and measures included in existing frameworks was proposed. Specifically, it advocated for ontology-based comparison and visualization, while consolidating insights from small and medium enterprises, the private sector, and policymakers.

The project's deliverables were envisioned to extend beyond mapping alone, to include activities such as tabletop exercises to verify how users can actually utilize frameworks, policy consultations, and capacity building.

Regarding the latter, the purpose was to enhance interoperability of international policy frameworks to promote data utilization essential for AI development.

Mechanisms to facilitate cross-border data sharing and support AI model localization were also proposed.

As part of this, voluntary technical standards, governance tools, and contractual terms were proposed, with practical verification through international sandboxes.

"Multilingual and Multicultural AI" Group

As a result of discussions, the establishment of a "Multicultural AI Consortium" was proposed.

Modern mainstream AI systems such as large language models (LLMs) are concentrated in languages with abundant data and cannot adequately reflect the world's diverse cultures and values. This could lead to cultural exclusion and discrimination.

This project proposed the establishment of a "Multicultural AI Consortium" as a framework for incorporating cultural diversity into AI. The proposed consortium would utilize the UN's "Endangered Languages" list to develop datasets for undervalued languages and aim to develop benchmarks and indices for evaluating cultural safety.

Project partners would include not only international organizations, governments, universities, and research institutions, but also local communities, cultural experts, and traditional knowledge holders. Comprehensive and collaborative efforts are required to ensure AI is developed in ways that protect cultural dignity and respect diversity.

"Open Source AI" Group

This project presented on "Making Open Source AI Tools More Accessible."

While open source AI is valued for transparency, collaboration, and innovation, frameworks and tools to ensure safety and responsible use are still under development. To address this challenge, the group agreed to first conduct a gap analysis of existing governance tools and, based on the results, build a taxonomy covering the entire AI lifecycle.

Subsequently, plans were made to develop practical mechanisms through public consultations, hackathons, and skill development. Stakeholders would include diverse players, such as major open source companies including hyperscalers (large-scale data center and AI companies), standardization bodies, alliances, universities, governments, and NGOs.

Figure 3: Group Discussion

(4) Participant Opinions

Following the Tokyo IW, surveys were conducted among participants, yielding valuable feedback that will contribute to the future activities of GPAI and its centers. Below are some selected responses:

"AI Utilization in the Global South and Strengthening of Domestic and Global AI Ecosystems" Group

- My sub-group had dynamic and respectful discussions in a good atmosphere where participants felt free to challenge each other's assumptions. It was not an "easy" discussion, but this is why it felt productive and meaningful. Through this discussion, I gained concrete understanding of the unique or amplified challenges in the Global South related to data, talent, and compute resources.
- While I had previously understood intellectually the problem of structural exclusion of minority and marginalized voices from AI training data, hearing others' lived experiences made the implications feel more tangible and urgent. Through this workshop, I felt a renewed responsibility to think critically about how we can ensure cultural and epistemic diversity in AI development and how we might build more equitable and inclusive systems.

"Interoperability of International AI Governance Frameworks" Group

- Through group discussions, I gained several key insights that deepened my understanding of challenges and opportunities regarding AI governance frameworks. One of the most valuable takeaways was recognizing that although many AI governance frameworks exist globally, there is a significant lack of interoperability, both in terms of structure and underlying principles.
- This discussion was very fruitful, with several important considerations on the levels of interoperability (principles, standards, regulatory frameworks) and the importance of clear and transparent terminology.

"Multilingual and Multicultural AI" Group

- Some participants expressed strong urgency about the need to mitigate risks (under-representation of minority languages and cultures) in using generative AI tools.
- I gained new perspectives on which language technologies are already being developed around the world, and it was impressive that many technologies were introduced during the discussion.
- I learned more about NICT's natural language processing (NLP) efforts.

"Open Source AI" Group

- There was discussion about open source AI challenges regarding tools (safety handling, compliance, etc.).
- The open source aspects of AI, existing AI tool catalogs compiled by OECD, and different country priorities regarding open source were also addressed.

5. Conclusion

The approximately 10-month preparation period from the establishment of the Tokyo Center in July 2024 to the holding of the Tokyo IW was a challenging journey, as this was the first time the secretariat organized a GPAI international conference. Under the leadership of Secretary-General Harayama, the secretariat worked as a unified team, collaborating closely with the other two centers, the OECD, MIC, and JICA, to deliver the most substantial workshop to date. This coordinated effort resulted in a highly successful international conference at the NICT Innovation Center, achieving record attendance, with participants representing numerous countries and diverse stakeholders.

We would like to take this opportunity to express our heartfelt gratitude to all those who contributed to the successful organization of the Tokyo IW.

Figure 4: Group photo of all participants

= A Serial Introduction Part 1 = Winners of ITU-AJ Encouragement Awards 2025

In May every year, The ITU Association of Japan (ITU-AJ) proudly presents ITU-AJ Encouragement Awards to people who have made outstanding contributions in the field of international standardization and have helped in the ongoing development of ICT.
These Awards are also an embodiment of our sincere desire to encourage further contributions from these individuals in the future.
If you happen to run into these winners at another meeting in the future, please say hello to them.
But first, as part of the introductory series of Award Winners, allow us to introduce some of those remarkable winners.

Hiroshi Ou

NTT, Inc. Access Network Service Systems Laboratories
(formerly known as NIPPON TELEGRAPH AND TELEPHONE CORPORATION)
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Fields of activity: BBF (Provider Cloud WA)

Proposal to Expand Automated Intelligent Management (AIM) Technology in BBF

I am extremely honored to receive the prestigious ITU Association of Japan Encouragement Award. I would like to express my deepest gratitude to everyone involved at the ITU Association of Japan for their immense help on standardization activities to date.

Automated Intelligent Management (AIM) is a technology for automating network operation management. I have participated in BBF since 2023, and I have worked on proposals to broaden the targets for operation through discussions on expanding AIM (creating the second issue of the document) as well as to broaden the applicable use cases.

Proposals have included changes to the title and scope of the first issue of the document as well as to the reference architecture itself, which made a significant impact. While there were some challenges in the beginning from participants who opposed these changes, through repeated lobbying efforts, we were able to successfully reach consensus.

What I realized by participating in these standardization activities is the importance of understanding the other person and expressing thoughts appropriately. In standardization activities, if the background and importance of a proposal are properly communicated, it is often possible to gain support for the proposal, be it from another company or even another country. In the case of my proposals, there have been many times where, through cooperation with many others, agreement has been reached on a proposal that is even better than the original, and I feel this is the fun part of standardization activities.

Being recognized for my positive contributions to BBF and being involved at the center of this revision work has made this work rewarding for me. Although much unfinished work remains until the document is completed, I will continue to work toward early completion with the cooperation of other companies.

Toshifumi Koishikawa

NTT DOCOMO SOLUTIONS, Inc.
(formerly known as NTT COMWARE CORPORATION)
koishikawa.toshifumi@nttcom.co.jp https://www.nttcom.co.jp/english/
Fields of activity: O-RAN Alliance (WG10/WG1), ETSI ISG ZSM

Standardization Activities toward Zero-touch Network Management and Open RAN

I am extremely grateful to receive the very prestigious ITU Association of Japan Encouragement Award. I would like to express my deepest gratitude to everyone at the ITU Association of Japan and to those from whom I have received support thus far.

I first got involved in standardization work in 2018 as a representative of NTT DOCOMO, when we began to see operators in multiple countries apply AI to their commercial networks, and it was at this exact time that ETSI ISG ZSM was established to standardize a framework for automating network management. As a founding member of this organization, NTT DOCOMO has been a proactive driver in discussions since the beginning and has thus been able to be involved in the fundamental specification work for ZSM, including use-case formulation as exemplified by AIOps (ZSM001), end-to-end network service lifecycle management from RAN (radio access network) to core networks (ZSM008), and operating specifications for the closed-loop ZSM architecture for optimizing network quality without human intervention (ZSM009-1～3).

From 2021, my activities shifted to the O-RAN Alliance, and we continue to contribute to Working Group 10, whose main focus is OAM (Operation, Administration and Maintenance) for RAN. While there has long been the problem of operators' RAN environments being inflexible and having difficulty connecting to equipment from different suppliers, the situation has changed thanks to the technological benefits of developments in virtualization technology. Taking advantage of them, we aim to realize a multi-supplier environment by making fault management, provisioning management, and performance management methods open between RAN equipment and OSS and by standardizing equipment alarms. In addition, we are promoting cross-collaboration between other working groups to which other DOCOMO members are participating in with the aim of making Open RAN even more practical.

I will continue to work toward further development of the telecommunications industry in Japan through contributions to international standardization.

Nomination for the Director of the ITU Telecommunication Standardization Bureau

- Since assuming the position of Director of the Telecommunication Standardization Bureau in 2023, Mr. Onoe has successfully led the World Telecommunication Standardization Assembly held in New Delhi in 2024, while actively promoting increased industry participation in the ITU.
- Mr. Onoe's outstanding leadership and achievements have earned high international recognition, and the Government of Japan believes that his re-election in the November 2026 election and continued service for a second term would be highly appropriate.

Since being appointed Director of TSB in January 2023, I have leveraged my 40 years of industry experience to promote the global outreach of standards, increase industry engagement, bridge the standardization gap, and strengthen collaboration within and outside the Union.
As I run for a second term, I pledge to further enhance cooperation with Members and stakeholders, striving to bring the benefits of technology to every corner of the world.

ONOE, Seizo

Present Title

Director of
the Telecommunication
Standardization Bureau (TSB)
at the International
Telecommunication Union (ITU)

Born

12 May 1957

Nationality

Japanese

Professional Experience

- 1982 Joined NTT Public Corporation
- 1992 Transferred to NTT DOCOMO, INC. at its foundation
- 2002 Managing Director of the Radio Network Development Department
- 2008 Senior Vice President and Managing Director of R&D Strategy Department
- 2012 Chief Technology Officer, Executive Vice President, a Member of the Board of Directors and Managing Director of the R&D Center (later R&D Innovation Division)
- 2017 President of DOCOMO Technology, Inc. and Chief Technology Architect of NTT DOCOMO, INC
- 2021 Chief Standardization Strategy Officer of NTT Corporation and Fellow of NTT DOCOMO, INC
- 2023 TSB Director at ITU

Education and Academic Achievements

- 1980 Bachelor of Electronics Engineering, Kyoto University
- 1982 Master of Electronics Engineering, Kyoto University

Awards

- 2007 Accomplishment Award by the ITU Association of Japan
- 2008 and 2014 The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology
- 2018 Medal with Purple Ribbon
- 2025 IEEE Jagadish Chandra Bose Medal in Wireless Communications

For further information : https://www.soumu.go.jp/onoe_seizo/

通巻百四十八号

ONOE, Seizo

Candidate for the Director of the ITU Telecommunication Standardization Bureau

定価　一冊　一、六五〇円（本体価格　一、五〇〇円、消費税　一五〇円）　年間購読料　六、六〇〇円（本体価格　六、〇〇〇円、消費税　六〇〇円）