

FEATURE

Supporting Starups and Regional/ Industry-Academia Collaboration

DIALOG

SUGIHARA Michiko×TOKUDA Hideyuki
NICT Entrepreneur Support Aims
at Solving Regional Issues



FEATURE

Supporting Startups and Regional/ Industry-Academia Collaboration



Cover Photo
Top: Participants of Entrepreneurs' Koshien held on March 13, 2024, and Ms. FUKUDA Sumire (Right), Leader of FairMed, receiving the Minister of Internal Affairs and Communications Award

Bottom: Participants of Entrepreneurs' Expo held on March 14, 2024, and Professor. KUBOTA Yasuhiro (Left), the CEO of Think Nature Inc., receiving the Minister of Internal Affairs and Communications Award

Photo Upper Left
The Network Operation Center in the Dullu Municipality office. The black device to the left of the rack is the NerveNet base station equipment. As it is composed of locally procurable inexpensive hardware, maintenance can be performed by local engineers (see pp.10 -11).

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NICT Entrepreneur Support Aims at Solving Regional Issues

This time around, Ms. SUGIHARA Michiko, who has been involved in the NICT start-up support program for many years, and President TOKUDA Hideyuki spoke to us about the roles NICT needs to fulfill to create and develop startups, and its vision for the future.

—Tell us about your connection with the “NICT Accelerator Program (Entrepreneurs' Koshien (entrepreneur championship for students) and Entrepreneurs' EXPO).”

SUGIHARA I worked at companies in the private sector and for 17 years have consistently engaged in the provision of support for startups in the field of ICT. From 2022, I launched my own company. At NICT, I have been constantly involved in providing support for startups starting from the “Information and Communication Venture Business Plan Competition,” a precursor to the Entrepreneurs' EXPO, and the “ICT Technical College Student Support Program,” a forerunner to the Entrepreneurs' Koshien. Fiscal 2024 will be the 23rd time the Entrepreneurs' Expo will be held and the 14th time the Entrepreneurs' Koshien will be hosted.

TOKUDA Approximately 20 years ago, the social mechanism for supporting entrepreneurs in Japan was still in a fledgling state. There were also few high school students with an entrepreneurship mindset.

—Tell us about the features of the NICT accelerator program (Figure 1).

SUGIHARA At the time in Japan, startup and venture ecosystems had not yet been es-

tablished. We believed that mentors would first be essential to serve as an older brother-type persona that could be consulted on matters including issues related to starting a business, such as the hiring of personnel and the procurement of capital. In light of this, in 2011 NICT launched the ICT Mentor Platform. We started off by forming organizations, including those comprising experts and venture capitalists. At the time, the word “mentor” itself was not a word that was frequently used. Consequently, initiatives carried out by NICT were implemented extremely early on.

TOKUDA I believe that the emergence of a mindset to start a business that solves various social issues in a particular region is extremely fantastic. In addition, I think it was amazing that people were passionate and worked hard to solve regional issues in Japan.

SUGIHARA ICT mentors participated the regional cooperation competitions. By considering an ideal vision for a region, entrepreneurs can improve their own perspective, and mentors can develop as well by nurturing entrepreneurs who emerge as a regional treasure.

NICT's philosophy of producing is fantastic, a result of the ties it has firmly built with a region by continuing to visit the region every year. The purpose is simply to design a startup ecosystem in the region and not for

SUGIHARA Michiko

for ideal Japan, Inc.
Representative Director and President

Joined UFJ Research Institute (currently Mitsubishi UFJ Research and Consulting Co., Ltd. [MURC]) in 2005. She has consistently been involved in providing support for research, planning and execution of measures to aid ventures in the field of ICT. Involved in the NICT entrepreneur support program from the initial stages. She launched the MURC's proprietary accelerator program in 2017. She was in charge of the program for all five fiscal periods as a place for a tripartite entity, mainly startups, large enterprises/regional core companies and municipalities to implement co-creation to “realize a sustainable regional community.” She retired in 2022, after which she established for ideal Japan, Inc. and assumed the position of representative director and president.

TOKUDA Hideyuki

President of the National Institute of Information and Communications Technology

Completed a Ph.D. in Computer Science from University of Waterloo, Canada. After he completed Ph.D. in 1983, he joined School of Computer Science, Carnegie Mellon University as Research Computer Scientist. He came back to Keio University in 1990 and became Professor, Faculty of Environment and Information Studies in 1996. He has been Executive Vice President of Keio, Dean of Faculty of Environment and Information Studies and Dean of Graduate School of Media and Governance, Keio University. His research interests are ubiquitous computing systems, operating systems, distributed systems and cyber-physical systems.

In 2017, he became President of National Inst. of Information and Communications Technology (NICT). He is also Professor Emeritus, Keio University, a member of Science Council of Japan (SCJ), president of CCDS, IPSJ fellow, JSSST fellow and a chair of IEEE Tokyo Section.

the purpose of holding events such as the Entrepreneurs' Koshien and Entrepreneurs' EXPO.

—The key point is that the mentor pinpoints the issues in the particular region and selects the personnel.

SUGIHARA We have focused on regions

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SUGIHARA Michiko×TOKUDA Hideyuki NICT Entrepreneur Support Aims at Solving Regional Issues

for several decades, from a time when the word deep technology or deep tech*1 did not yet exist. Given the goal of creating ICT startups that originate from a region, we placed our attention on technical technical colleagues (Kousen)‐, educational institutions that specialize in training engineers. We consequently decided to firmly develop technical colleges, which produce entrepreneurs-in-the-making that will play an active role in the field of ICT.

TOKUDA Recently, technical colleges are received a lot of attention. We are exporting the proprietary system in Japan to other countries including Vietnam and Thailand. It is a waste to simply nurture engineers. It becomes vital to turn attentions toward to local communities, and use the skills they possess to solve regional issues. One characteristic of primary and secondary education in Japan is that emphasis is placed on presenting students with problems and teaching them how to solve the problem. Going forward, it is necessary to develop the problem-finding skills of students, so that they can discover and analyze "real" issues.

Mentors possess a rich cache of industry knowledge and are skilled at consulting. In light of this, they respect the original opinions of entrepreneurs-in-the-making while providing expert coaching. For this, we are very grateful.

SUGIHARA Thank you. At present, the mentors are mainly composed of venture capitalists but there are also some entrepreneurs. To proceed with the social implementation of NICT research results, we believe it is important to collaborate with the mentor team. From the point of amassing knowledge acquired from a series of projects to contribute to social implementation from research and development, I believe they will fulfill an important role going forward.

—Explain the role of an ICT mentor in detail.

SUGIHARA Basically we are utilizing a mentor-in-charge system. A mentor is responsible for a particular region, and partic-

ipates in the collaborative event held in each region. Hence, a mentor focuses on a technology or entrepreneur that catches their attention, and provides mentoring. However, in many cases, the entrepreneurs-in-the-making develop a solution based on a single hypothesis. Those areas that have yet to be organized will be organized and incorporated into logic that will be understood by anyone who hears it.

TOKUDA Good mentors provide encouragement to entrepreneurs-in-the-making. In my opinion, a good coaching technique is to successfully extract the abilities an individual possesses.

SUGIHARA One more thing is that, as I mentioned in the beginning, we as mentors value the design of a regional startup ecosystem. Given that we believe the design of the innovation ecosystem, which includes existing local industries, is important in addition to startups, we plan to compile the four viewpoints, the "New Industry Creation Capabilities (Figure 2)," from this fiscal year onward, and are using them as a common language shared with each region. For instance, the "source of entrepreneurs" is a viewpoint that is essential for producing entrepreneurs from regions. It is insufficient to have universities and technical colleges as the sole source of entrepreneurs. "Opportunities to enhance an entrepreneur's point of view" is crucial as it showcases major role models that aim to conduct business globally. Moreover, (4) Honing the characteristics and strengths of the region is an important viewpoint that is essential for the growth of entrepreneurs. An issue that must be confronted going forward is that entrepreneurs need to discover their own strengths in their respective region, organize, hone and create a sacred place for entrepreneurs. Mentors, based on these four viewpoints, are responsible for designing an innovation ecosystem through discussions with the region.

—What is the role required of NICT?

TOKUDA There are key universities and technical colleges in each prefecture. It is

important that a sustainable model is created whereby regional issues are solved at these educational institutions, and startups are launched utilizing the strength of the respective region. It is very important that key educational institutions in these regions play a critical role in the building of an ecosystem.

It is my suggestion that, in addition to universities and technical colleges, "AI High Schools" be built as a type of next-generation high school, along with SSHs (Super Science High Schools)*2 and DX High Schools*3. The learning style will be to study through human-AI co-creation to unearth and solve issues. For example, new businesses can be designed by taking into account the ideas and concepts of young people and using generative AI. From a technical standpoint, these schools can also conduct drills on creating AI that has a higher degree of safety and security. There are likely opposing opinions. However, students should discuss topics, including using AI as a new tool, and applications and ethical, legal and social issues of AI, from the viewpoint of building their own future.

SUGIHARA In actuality, building high schools is difficult. To overcome this hurdle, for instance, it might be a good idea to create a "generative AI high school division" at the Entrepreneurs' Koshien.

TOKUDA If it is possible to do this within the framework of the Entrepreneurs' Koshien, then NICT can provide a "space" to do this on its own initiative. I hope that this idea will be utilized effectively.

SUGIHARA NICT is considering kicking off a "New Entrepreneurs' Koshien" and "New Entrepreneurs' EXPO" in and after 2026, with exhibition at the Expo 2025 Osaka-Kansai serving as a turning point. Successfully incorporating your idea into these events would be beneficial.

—Tell us about the direction startup support and industry-academia-government collaborations will take going forward.

SUGIHARA Going forward, the core of

investments will be in deep tech. In light of this, attention will be on research and development startups launched by research institutions such as NICT and universities. Research and development-type startups underpinned by technology require both time and capital but has the potential of being a business that has a sizeable impact on society. We have the conviction to nurture these into next-generation industries, and plan to firmly support them along with industrial circles.

TOKUDA From this perspective, NICT will play a fairly important role. NICT is conducting research and development on high-risk items contained in its medium- and long-term vision. Consequently, regarding the deep tech, it will be good to carry out the social implementation of these technologies in collaboration with individuals that possess an entrepreneur mindset.

Research and development thus far was based on a linear model, extending from basic to applied research, and then proof-of-concept, and finally social implementation. I think we can achieve social contribution by moving forward with the implementation of a non-linear model in which collaboration is carried out with external individuals that possess an entrepreneur mindset from the basic research stage, deploying the usable portion of research results in businesses by grasping needs. At the same time, we could provide feedback to research and development, mainly concerning the areas to which we plan to make further improvements.

SUGIHARA For instance, open innovation would be made easier by proceeding while having NICT researchers participate as technical mentors, and while holding discussions with the market side. As I mentioned earlier, ICT mentors can achieve growth by carrying out mentoring. I believe this holds true for researchers as well.

Also, a next generation of researchers can be nurtured if we can convince children that "being a researcher is distinguished," given the opportunity that the researchers join such projects.

TOKUDA I agree. The paradigm of research and development changes at a fast pace. Social needs also change drastically. The role that researchers are expected to fulfill is growing wider at a rapid pace. Researchers need to be able to explain the value of their research and the impact their research will have on society to people outside of their company/institution. As a national research institution, NICT is expected to serve as a hub which brings together industry, academia, government, and local communities.

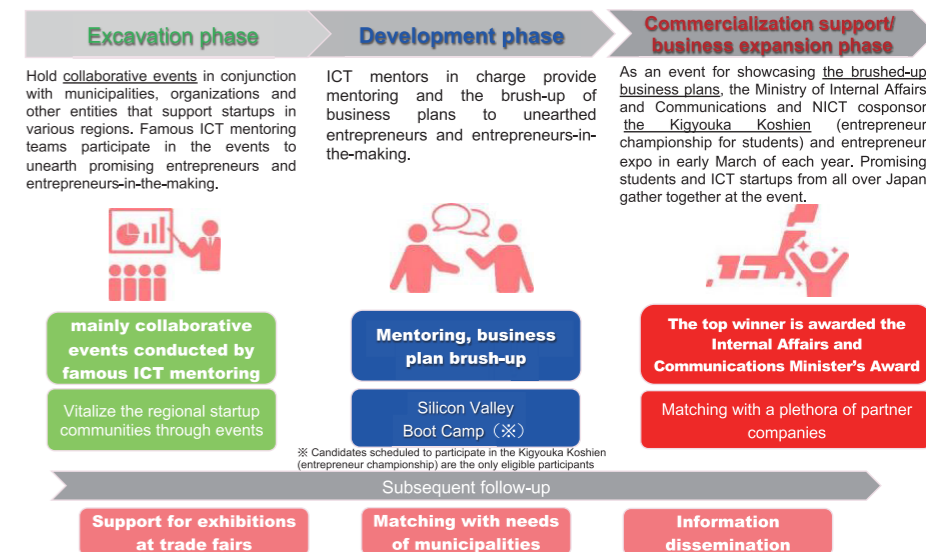


Figure1 NICT Accelerator Program for the Creation of ICT Startups with Regional Origins

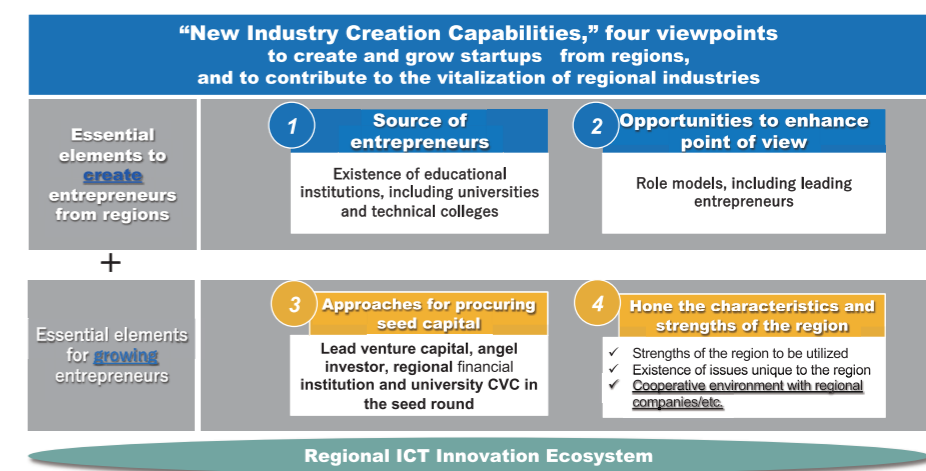


Figure2 Four Viewpoints for Creating and Growing Startups from Regions

—Give us your outlook going forward.

TOKUDA One factor is that there will be more opportunities than before for researchers to externally disclose their research results. There will also be an increase in opportunities to meet with companies and entrepreneurs that require these technologies. I think it is great that NICT researchers who possess technical ideas have the opportunity to have enthusiastic encounters with individuals with an entrepreneur mindset.

SUGIHARA We have dispatched frontline venture capitalists and entrepreneurs to act as mentors to regions. We will take this a step further, aiming to connect regional industries with NICT's leading technologies so that they can go global.

TOKUDA Secondly, to expand collaborations with overseas entities, for example, individuals that plan to initiate a startup overseas can be invited to Japan, and give a presentation in English with their members in Japan. I believe it is crucial to experience

differences in both the sense of value and culture.

SUGIHARA I do not believe this is limited to presentations. It would be good for members to experience the process of creating something together. Naturally, there are likely to be conflicts but this is also important. I believe it will also be good to maintain these connections going forward. I plan to come up with even better programs going forward. Thank you.

*1 Initiatives to solve social issues that substantially impact our lives and society by using scientific discoveries and innovative technologies. AI, autonomous driving, aerospace travel, clean electrical power, quantum computing, genome editing and other technologies are cited as fields for solving.

*2 Schools designated by the Ministry of Education, Culture, Sports, Science and Technology for the purpose of cultivating scientific inquiry and other skills of students, and for nurturing scientific and technical personnel that can play an active role internationally further out through advanced science and technology, and science and mathematics education at high school and other educational institutions.

*3 Schools that implement a curriculum that focuses primarily on information and mathematics and that strengthen investigative learning that traverses the humanities and sciences using ICT.

FairMed Seeks to Create a Medical Device Helps Physicians Provide Safe, Accurate Medical Care for Endovascular Surgery

Engineers designing cars can simply get in and drive them, making it simple for them to create cars that are easy and safe to drive from the user's point of view. And it's the same for physicians, who have people's lives in their hands. Designing medical devices requires a physician's practical experience. There is a researcher who, with this in mind, left a major medical device manufacturer to enter medical school and become a physician. Ms. Sumire Fukuda has enrolled in Kobe University School of Medicine, and we sat down with her to talk about the motivation and purpose behind her change of profession.

When Sumire was a company employee, she attended a conference and witnessed a shocking scene. During a live video of a surgery in which a catheter was being inserted into a cerebrovascular vessel to treat an affected region, the catheter suddenly broke through the vessel and blood spurted out. "There were several hundred people in the venue," she says, "and at that moment dead silence fell over the venue." Everyone was so shocked that they were speechless. Sumire was no different, and this strongly motivated her to change her profession and enter medical school.

At that time, Sumire was engaged in the development of medical devices for a major medical device manufacturer, working on research and development of embolization coils to treat aneurysms. "I was very shocked, because the incident was related to the work I was doing at the time," said Sumire. "I realized there might be a limit to the improvements we could make to conventional

medical equipment."

Even when a skilled surgeon performs a textbook surgery, such a complication can occur.

Don't we need a physician's point of view?

Sumire considered the issue. "As a developer of medical devices, I really wanted to know what kind of tactile sensations doctors get in their hands and fingers during surgery." Sumire's voice rose with excitement.

Then she took a surprising step. After quitting her job at the medical device manufacturer and studying intently, she entered Kobe University School of Medicine as a second-year student. She plans to obtain her medical license in a few years.

At the time of Sumire's entrance exam, Kobe University School of Medicine had launched a Medical Device Producer (MDP) Training Program and was preparing to open a graduate school to train human resources for medical device research and development, led by Specially Appointed Professor Yasuda and others in the Graduate School of Medicine/Department of Medical Device Engineering. The time was here and the environment was right for Sumire to achieve her dream.

Medical equipment design that enables all physicians to provide safe, accurate medical care

The medical device designed by Sumire has never existed before. It is called an "AI-powered navigation system for endovas-

cular surgery." In a surgery for cerebral hemorrhage, a thin tube called a catheter is inserted into a cerebrovascular vessel. The physician who is performing the surgery needs to have intense concentration. The catheter must be subtly manipulated while the physician is viewing up to six images simultaneously. Even the slightest misalignment can lead to complications, such as a cerebral hemorrhage.

The system developed by Sumire features an equipment tracking function. While a physician is simultaneously viewing six images, the system uses sound and images to show them the direction in which the catheter is to be moved.

Another key feature of this device is the surgical protocol navigation function.

"Each patient has different symptoms, and it is necessary to choose a treatment plan accordingly," said Sumire. "If we choose an inappropriate plan, it takes 20 to 30 minutes to add or change the equipment used. This delay has a significant impact on patient prognosis. That is why we are developing an AI-powered navigation system that can suggest the optimal treatment plan to physicians."

In fact, when blood flow in the brain is disrupted, about 1.9 million brain cells die every minute. Studies have shown that thrombectomy surgery for cerebral infarction leaves 67% of people with moderate or greater disability after the surgery if the time from the start of the surgery to the recanalization of blood flow is longer than 30 minutes. In order

to prevent patients from being physically impaired, it is essential to respond to a cerebral infarction as soon as possible. This new AI-powered system suggests the optimal treatment plan for complex catheterization surgery to physicians, in hopes of achieving equitable healthcare by providing safe, accurate treatment wherever it is provided.

Club activities at the full-scale social implementation level

An attempt to implement this AI-powered surgical navigation system in society is being conducted by an organization called FairMed, which was established under the leadership of Sumire. It's an activity of Kobe University's Innovation Club. Applicants are required to pass a test before they are allowed to join the club. It is staffed with faculty advisors in specialized fields, including Professor Kumano, who gives advice on how to achieve social implementation.

"Through repeated discussions with faculty members and peers, my ideas gradually came together and the concept of an AI-powered navigation system took form," Sumire says of the insight she gained in the Innovation Club.

She says that thanks to the Innovation Club, her network of contacts expanded and she was able to make connections in various places. She participated and won awards in domestic and international business contests. She won the NICT Award in the Miraino Pitch 2023 entrepreneur contest. Later, in FY2023, she won the Minister of Internal Affairs and Communications Award in the Entrepreneur Koshien, which is sponsored by the Ministry of Internal Affairs and Communications and NICT.

FairMed's name recognition gradually increased, and it began to receive inquiries

from medical device manufacturers and investors, according to Sumire. "At first, I had only my single-minded desire to create a new medical device, but I later realized that there are other perspectives besides research that are necessary for social implementation," says Sumire. "I also realized that my mentors played an important role in expanding my network and knowledge," Sumire went on to say. "In this respect, it was significant that I was able to receive mentoring from NICT's ICT Mentor and to participate in the Entrepreneur Koshien."

Sumire hopes to commercialize the device in the 2030s, but there are challenges that must be overcome, such as receiving approval for a new medical device from the Ministry of Health, Labour and Welfare, and insurance coverage. According to Sumire, it is currently difficult for such a programmed medical device to clear domestic regulations. However, she and her team plan to actively lobby the Ministry of Health, Labour and Welfare. She is also enthusiastic about marketing this device to advanced medical countries like the United States, Europe, and Australia.

When asked about the meaning of the

FairMed Representative

Currently enrolled in Kobe University School of Medicine, a member of the university's Innovation Club.

Joined Kaneka Corporation in 2016. Engaged in the development of therapeutic medical devices. After witnessing an intracranial hemorrhage occurring during cerebral endovascular surgery as part of her duties, she felt the need to not only develop medical devices, but also to have the perspective of a physician who uses them. She entered Kobe University School of Medicine in 2020. While studying at the School of Medicine, she is also a member of the university's Innovation Club and launched FairMed to develop an "AI-powered navigation system for endovascular surgery." She has won awards in various competitions, including Miraino Pitch 2023 (mirai [meaning future] + innovation = Mirainno) and the Entrepreneur Koshien.

FUKUDA Sumire

name "FairMed," Sumire says, "I named it with the hope that everyone can receive fair medical care." Having become a mother while enrolled in the School of Medicine, she says that by the time her own child grows up, she hopes to live in a society where everyone, no matter where they are, has equal access to advanced medical care. Sumire plays the roles of both an engineer and a physician, and has the perspective of both. We look forward to a future in which these combined perspectives can deliver advanced medical care to all patients.



Message from Mentor

When I met Ms. Fukuda, my first impression was that she was very serious about working on this project, because few people have the will and determination to change professions from working at a company, to enter Kobe University School of Medicine. While mentoring her, I was impressed by the way she always responded to my comments with 120% of output, and was very much looking forward to all the possibilities and goals she would be achieving in the future. In my experience as a capitalist, I have seen many times when entrepreneurs with strong passion and determination ultimately succeed in their businesses through their unrelenting efforts, and would be unbeatable even by the most highly skilled entrepreneurs. I sincerely look forward to the day when Ms. Fukuda achieves her vision of FairMed, saving many patients and bringing them happiness.



TAJIMA Souichi

General Partner, Genesia Ventures, Inc.

After working for Sumitomo Mitsui Banking Corporation and CyberAgent, Inc., Mr. Tajima founded Genesia Ventures, Inc. in late August 2016, the firm he continues to run to this day.

For a Nature-Positive Future in Harmony with Nature: "Think Nature"

"Nature positive," in other words, "recovery of nature," is a concept that has attracted much attention in recent years. Currently, there are concerns about mass extinction crisis of wildlife on Earth and the disappearance of biodiversity. Halting this loss and reversing it into a positive trend is the essence of what nature positive means. However, this cannot be achieved simply by talking about it. Prof. KUBOTA Yasuhiro, who has been working on biodiversity research for more than 30 years, took action. He is a professor in the Faculty of Science at the University of the Ryukyus. What motivated him to come out of academia and get into the biodiversity business? And what are his goals?

A startup from Okinawa is now attracting attention. It aims to promote conservation and restoration of the natural environment through the mechanism of the economic market by turning biodiversity into a business.

The company is Think Nature Inc., started by Prof. KUBOTA Yasuhiro, a professor in the Faculty of Science at the University of the Ryukyus.

First, we asked Prof. KUBOTA, What does biodiversity mean?

"Biodiversity is the total abundance of living organisms. There are various species on the Earth, and each species is distributed according to its functional traits, adapting to the environment of each location. The assembly pattern of individual species according to abiotic and biotic condition makes up ecosystems such as forests, grasslands, rivers, and oceans. Diverse ecosystems then provide various economic services that support our daily lives. In other words, biodiversity is the foundation of our society and economy, and our natural capital."

Come to think of it, most of the materials that make up food, clothing, and housing are derived from living organisms. Therefore, if biodiversity collapses, society will also lose its foundation.

"Five years ago, when we started Think

Nature to create biodiversity-related markets and industries, everyone asked, "Do you really believe you can do business in biodiversity?" said Prof. KUBOTA.

■ Closedness Surrounding Academia

One of the reasons why Prof. KUBOTA considered developing the biodiversity business was that the significance of basic research such as biodiversity science was difficult for society to understand. He has continued in biodiversity research since he was a student. He conducted fieldwork throughout Japan, as well as overseas including tropical forests of South East Asia and Africa.

"I was convinced that the basic science potentially had the most applied and socially useful elements and therefore it should be able to contribute to the economy, and that the field of biodiversity research would provide knowledge that could transform the socio-economy," said Prof. KUBOTA.

Based on the vast amount of data he had collected, along with natural history-related data published by researchers around the world, he began to build biodiversity big data and create tools to visualize the value of the abundance of the natural environment. Using machine learning and AI models, his team released a biodiversity map

website called J-BMP in 2020. The website visualizes nature in Japan and around the world, enabling quantitative and intuitive understanding of information on biodiversity conservation and restoration.

Thanks in part to this visualization application, Prof. KUBOTA and his team's activities gradually became known to government agencies and companies.

■ Riding the Wave of Changes of the Times

Furthermore, the changing times seemed to support their vision. At the time, carbon neutrality was already being called for as a countermeasure against global warming. In October 2020, the year after starting the business, the then Suga Cabinet issued the "Carbon Neutrality Declaration," which required companies to explicitly implement measures to become carbon neutral. Companies were required to report greenhouse gas emissions (GHG^{*1}) generated from their business activities.

In fact, the Convention on Biological

Diversity was set with the United Nations Framework Convention on Climate Change. But while the world talked only about greenhouse gas emissions, conservation and restoration of biodiversity was also an important issue.

While carbon neutrality had already become a major social movement, Prof. KUBOTA was convinced that "Biodiversity will also become an integral part of corporate activities."

Terms such as TNFD^{*2} and TCFD^{*3} are unfamiliar to the general public. The former refers to the Task Force on Nature-related Financial Disclosures (guidelines released in 2023) and the latter to the Task Force on Climate-related Financial Disclosures (final report released in 2017). Both are guidelines for assessing and disclosing information on the risks and opportunities of corporate activities related to climate and nature at the request of the financial sector, including institutional investors, and are indispensable for future corporate activities and corporate social valuing.

Think Nature provides products from both passive and proactive perspectives for measures regarding biodiversity in business. The company considers the aforementioned TNFD and other information disclosures as passive responses to biodiversity, and provides TN LEAD and GBNAT services. These services identify paths toward achieving nature positive by locating the interface of corporate activities with nature, evaluating the dependence and impact of corporate activities on nature, and making full use of climate change scenario analysis to assess nature-related risk and opportunity. On the other hand, it sees promotion of biodiversity restoration as an proactive response, and provides services including TN GAIN. It

quantifies biodiversity gain in corporate greening projects, management of company-owned forests, conservation and restoration of seagrass beds and coral reefs related to blue carbon, and environmental restoration agriculture, among others.

■ The Future of Think Nature

In this way, Think Nature began to make waves and expanded its operations last year. The number of its employees has grown to more than 30, including Ph.D. holders, management and finance professionals. It is about to take off as a solidly organized company.

Winning the Minister for Internal Affairs and Communications Award at the 2023 Entrepreneurs' Expo (sponsored by the Ministry of Internal Affairs and Communications and NICT) has also helped to raise awareness of Think Nature among companies.

"I feel it is fate that I was able to meet with people in the finance and other business sectors after promoting biodiversity research, which is the most fundamental of the sciences. I want to use a science-based

approach to drive climate change countermeasures and biodiversity conservation and restoration as a business. The greatest impact from climate change will be felt by the younger generation, who will still be working for several decades to come. If the general public deepens their understanding of climate change and biodiversity, I think the future of the Earth will be brighter. I want to make it the final mission of my life to contribute, even if only a little, to creating such a catalyst for social change."

Prof. KUBOTA says that he wants to make creating a strong nature positive flow his final job, but it is still too early to say that it will be his last job. In fact, he and his team are moving to further expand their work, not only in Japan but also overseas. Businesspeople who have the perspective and experience of a scientist are a valuable asset. We have high expectations for Think Nature's future.

*1 GHG : Green House Gas
*2 TNFD : Taskforce on Nature-related Financial Disclosures
*3 TCFD : Task Force on Climate-related Financial Disclosures

KUBOTA Yasuhiro

Representative Director / CEO, Think Nature Inc.
Professor in the Faculty of Science at the University of the Ryukyus

Associate professor since 2007 at the University of the Ryukyus, where he has also served as professor since 2015. Specializing in ecology. Promoting biodiversity conservation science through fieldwork in forests around the world and data science using big data and AI. In 2019, founded Think Nature Inc., a startup to create biodiversity markets. Won the Minister for Internal Affairs and Communications Award (Grand Prize) at the 2023 Entrepreneurs' Expo.

Message from mentor



YAMADA Yudai
General Partner, Partners Fund

Joined Gree Inc., in 2012. After working in the CEO's Office and Financial Strategy Office, then moved to Incubate Fund KK in 2016. After becoming independent in 2018, currently he manages two VC funds.

There are three points that I think are wonderful about Think Nature: team unity, its business areas, and management. The first is team unity. I think it is great that this startup has formed a team of 30 people with highly specialized knowledge, both from academia and business. Second, in terms of business areas, the company has conducted the most specialized research in Japan on the theme of biodiversity, which will be at the center of environmental issues that companies will face for the next several decades, and the concept is being introduced mainly by large companies. I think they have strength that ordinary startups do not have. Finally, the third point is management. I was impressed not only by Professor KUBOTA's expertise, but more importantly by his toughness and sincerity. Even with his busy schedule, he is learning about finance and making presentations. I could feel his enthusiasm for making this a business without being confined to academia and that can be implemented in society. I hope I will continue to back him up as one of his supporters.

Odekake Watcher

A Case Study of Public-Private-Academia Partnership in the Community



MIZUTANI Kohei
Manager
Regional/Industry-Academia Collaboration Promotion Office,
Strategic Program Produce Office,
Social Innovation Unit

Since joining CRL (presently NICT), Dr. Mizutani has conducted research in laser remote sensing of the Earth's environment. He currently conducts research in satellite-based LiDAR. His responsibilities at NICT include planning and administration of commissioned empirical research projects. A JAXA visiting researcher. Doctor of Science.



YOSHIDA Hitoshi
Innovation Producer
Regional/Industry-Academia Collaboration Promotion Office,
Strategic Program Produce Office,
Social Innovation Unit

At NICT, Hitoshi YOSHIDA has driven technology deployment and real-life implementation via partnerships with universities and businesses. His work serves the practical implementation of ICT through partnerships capitalizing on commissioned research. He is Shikoku Research and Development Promotion Support Advisor for the Shikoku Information Communication Conference of the Ministry of Internal Affairs and Communications.

The Regional/Industry-Academia Collaboration Promotion Office under the Strategic Program Produce Office, and the Commissioned Research Promotion Office under the Innovation Promotion Department are both part of NICT's Social Innovation Unit. Both of these offices support the development of new services by selecting by open call and commissioning advanced R&D in communication and broadcasting from parties conducting empirical research and development in data coordination and utilization solutions for addressing community issues. One of the projects resulting from this support program is Odekake Watcher, a service provided by Odekake Labo, an arm of Blogwatcher, Inc. Odekake Watcher has been adopted by more than five hundred Japanese local governments, tourism bodies, and businesses. It is outlined below as a case study of NICT's public-private-academia partnership in the community.

What is Odekake Watcher?

Odekake Watcher is a digital tool provided by Blogwatcher, Inc. designed to enable anyone to utilize from any location tourism statistics capable of informing sustainable tourism destination management, data-based policy evaluation (or evidence-based policy making),* and nonresident population growth strategies fundamental to tourism administration and marketing.

Developed specifically for analyzing tourists, Odekake Watcher uses GPS location information from smartphones to monitor tourism flow data. Its basic functions are free to use if you are a tourism policy maker employed by a local government, tourism bureau, or similar. Subscribers can access data such as the number of visitors to a certain municipality or visitor attraction, and the number of people touring specific multiple attractions, narrowed down by prefecture of departure, gender, and/or age group. Odekake Watcher uses as its source data GPS location and attribute information obtained with

explicit consent from smartphone users via more than 140 different smartphone apps. This raw data is analyzed and processed by Odekake Labo, employing its original knowhow. Data for each week from Monday to Sunday is made available the following Thursday in what is a near real-time service.

To date, Odekake Watcher has been adopted by over five hundred organizations including the Aichi, Kochi, and Nagasaki prefectural governments; the Fukuoka municipal government; and tourism bodies such as the Hiroshima Tourism Association, Kyoto Tourism Federation, Tokyo Convention and Visitors Bureau, and Okinawa Convention and Visitors Bureau; as well as businesses.

How Odekake Watcher came to Exist, and how NICT became Involved

Odekake Watcher was developed by Odekake Labo, founded by GPS-based gameware maker COLOPL, Inc., in 2011 as its in-house research center for surveying and analyzing peoples' movement. COLOPL—known for its location-based game Colony na Seikatsu (Colony Life), which was initially a private side business started by its founder and current chairman Mr. BABA Narukatsu in 2003, and for its cross-industry collaborations based on GPS games—was working from 2010 toward deploying a location information service platform participated in by multiple GPS game providers. Odekake Labo was established to apply COLOPL's location information analysis knowhow to tourism policies and measures. In 2013, COLOPL, in partnership with KDDI, launched a service for providing reports on tourism dynamics based on location information obtained with prior consent from smartphone users served by the carrier au, winning commissions from Shirakawa-mura in Gifu Prefecture, Toyooka City in Hyogo Prefecture, cities in Tokyo, and other municipalities seeking aid in boosting community-based tourism.

Believing that COLOPL's knowhow would be useful for addressing community

issues, NICT's Regional/Industry-Academia Collaboration Promotion Office adopted and commissioned a research project entitled, "Research and development of a symbiotic ecosystem with international visitors to Japan utilizing car rental mileage data." Jointly conducted by COLOPL and the Kyushu Institute of Technology, which happened to be Mr. Baba's alma mater, the study aimed to expand COLOPL's existing service, commencing in FY2019 as the first project that NICT commissioned to COLOPL. Kyushu University joined the project from FY2020 to become "Research and development of a system for evaluating tourism measures and policies through largescale location data coordination," which over the course of three years developed a system for supporting evidence-based policy making.

The commissioned research project was still under way in 2021 when Odekake Labo was transferred from COLOPL to Blogwatcher, Inc. through a business transfer agreement. The project, now in the hands of Blogwatcher, went on to develop and reinforce key aspects of Odekake Watcher's practical application, such as traveler attribute identification and adjustment logic; the weekly data coordination environment; and a system for evaluating visitor growth plans. These were then tested by various means including interviews with public and private sector tourism professionals. Successfully released for commercial use thanks to these achievements, Odekake Watcher to this day continues to expand its range of features. Odekake Labo has been headed, both before and after its transfer from COLOPL, by Mr. SAKAI Koki, who transferred to Blogwatcher along with the lab.

Other NICT Activities Conducted for and with Communities

NICT's Regional/Industry-Academia Collaboration Promotion Office supports communities through the adoption of ideas and services potentially useful for solving the issues they face. In addition to tourism, these

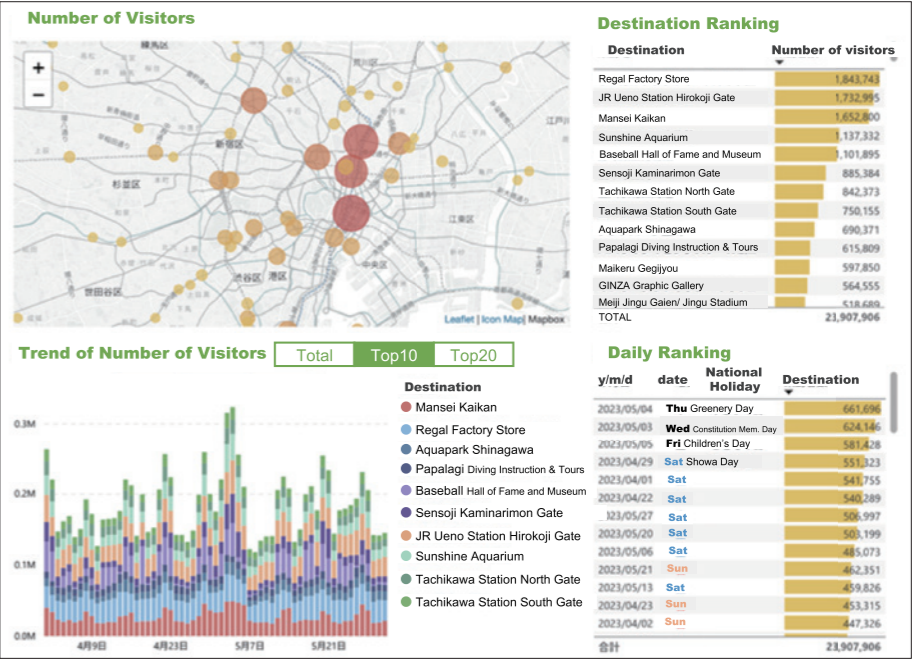


Figure 1 Odekake Watcher user interface

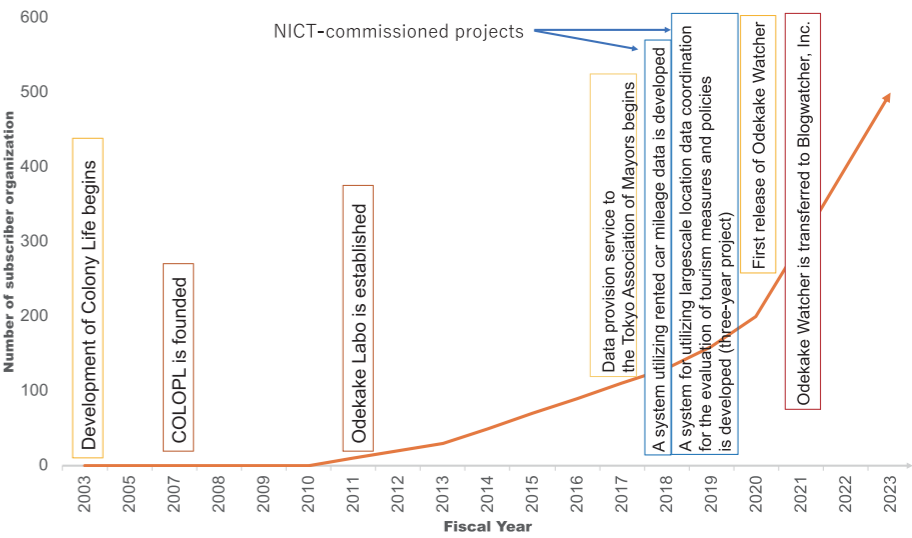


Figure 2 Timeline of Odekake Watcher

zies including crop and animal agriculture. Past projects conducted through NICT support include drone-assisted management of strawberry production; AI-powered chick sexing; digital technology-assisted management of sake production conditions; community disaster mitigation through standardization of multilocal micro pressure fluctuation measurement packages and field tests with public participation conducted in the environs of large cities as well as hilly and mountainous areas; research and development of a digitalization matrix for community waste management, collection, and reduction employing fine-grained data on the

volumes of garbage put out for collection; and others.

Please visit the NICT website below to find out about the progress of related research projects commissioned by NICT to date.

https://www.nict.go.jp/collabo/commis-sion/itaku_kobo.html (in Japanese)

*EBPM: Evidence Based Policy Making involves basing policy plans on rational evidence, with a clear policy purpose, eschewing reliance on ad hoc episodes. (Source: Cabinet Office statement <https://www.cao.go.jp/others/kichou/ebpm/ebpm.html>) (in Japanese)

courtesy of Mr. SAKAI Koki, Head of Odekake Labo, Blogwatcher inc.,

Establishing Networks and Services in Mountainous Areas of Nepal



OWADA Yasunori

Senior Researcher
Sustainable ICT Systems Laboratory,
Resilient ICT Research Center,
Network Research Institute

After completing graduate school, he worked as a specially appointed assistant professor at the Niigata University Research Institute for Natural Hazards and Disaster Recovery, and as president of Space-Time Engineering Japan, Inc. before joining NICT in 2013. He is engaged in the research and development of autonomous distributed information and communication systems that can be used under a wide range of conditions. Doctor of engineering.



Ved Prasad Kafle (Left)

Research Manager
Network Architecture Laboratory,
Network Research Institute

After completing his PhD (Informatics), he joined NICT in 2006, where he is currently engaged in research on next-generation network architecture, among other research. He is concurrently engaged as a Rapporteur of ITU-T Study Group 13 to contribute to the standardization of advanced network technologies.

INOUE Masugi (Right)

Director General,
Resilient ICT Research Center,
Network Research Institute

After completing his graduate school doctoral program, he joined CRL (now NICT) in 1997. He is engaged in R&D, planning and strategy, and international collaboration in a number of fields including millimeter-wave ultra-high-speed wireless LAN, heterogeneous wireless network control, autonomous distributed access networks, and disaster-resistant digital infrastructure. Doctor of engineering.

Under the Asia-Pacific Telecommunity (APT) international demonstration project (Category II), which was proposed by the Nepalese government and adopted, NICT has been engaged in a four-year demonstration project since 2020 to build and verify the effectiveness of a network system that will help solve regional issues using environmentally resistant optical fiber cables and NerveNet in the mountainous areas of Nepal. These demonstrations concluded at the end of February 2024, and the constructed network and its application software were transferred to the local municipality free of charge. The network was deployed in local society so that it can continue to be operated through public and private sector collaboration. We would like to describe these activities in this article.

Meeting Unique Local Needs

Much of Nepal's land is mountainous, and there are numerous villages where even roads, electricity, and running water, let alone communications, are not adequately developed. Dullu, which the Nepalese government selected as the site for the implementation and demonstration of the project, is a municipality made up of 13 wards in Dailekh District, Karnali Province, located approximately 400 kilometers west of the nation's capital, Kathmandu, and is home to approximately 6,900 households and 45,000 people. The area can be reached by flying into its nearest airport from Kathmandu followed by an approximately 4- to 5-hour drive on an off-road vehicle (Figures 1 and 2). The Human Development Index (health, education, etc.) of the region is remarkably low even by Nepalese standards. Because it is a hilly region, it is also prone to natural disasters such as forest fires, floods, and landslides. With regard to medical care in particular, there is only one hospital capable of performing simple surgeries for the entire population of the Dailekh District, including Dullu, which numbers about 260,000 people. Because patients must travel for hours—even days in some cases—

to reach this hospital, it is unable to address emergency cases.

The purpose of this project was to provide access to administrative and medical services within the region by connecting major points using ITU-T L.1700/L.110 standard-compliant optical fiber cables (Figure 3) that are highly environmentally resistant and suitable for depopulated areas, and augmented by a distributed application environment by deploying NerveNet, a disaster-resistant communications and information platform technology that we have researched, developed, and deployed in fields for offering practical application services. In providing NerveNet technology, we placed the highest priority on making sure that local personnel are able to deploy and operate the technology. We worked with the local NPO ICT4D (Center for Information and Communication Technology for Development) Nepal, where our primary aim was to establish a project partnership where ICT4D Nepal played a central role in learning NerveNet technology, procuring equipment, and in building, configuring, and operating networks.

For Local Sustainability and Development

This project, which began in 2020, was impacted by the COVID-19 pandemic very shortly after its launch, making it difficult for us to meet with local members face-to-face. NerveNet technology is all software and can be delivered remotely. With an eye toward enabling future expansion to be carried out by local parties, we researched, selected, and procured software-defined networking (SDN) white box equipment that was locally available. We then provided repeated training to local engineers via web conferencing over an extended period of time, covering everything from how to install the software to the settings required for each device, and how to build and operate the network. By the end of 2022, local engineers were able to use hardware that was scheduled to be installed to test the configuration and operation of the Ner-



Figure 1 Location of Dullu Municipality and overall structure of the network



Figure 2 View from the rooftop of the Dullu Municipal Office. The roads are unpaved and follow contour lines, so even though the opposite mountainsides may appear close, they are very time-consuming to reach.

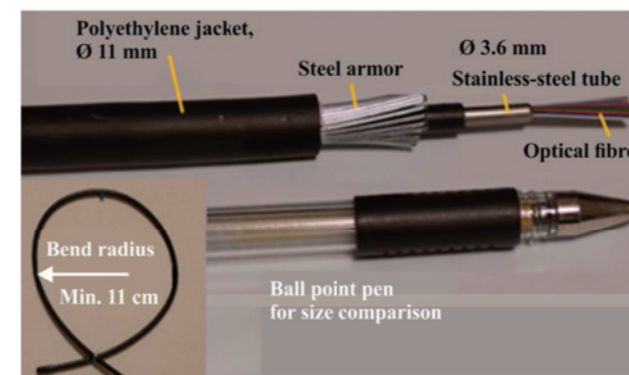


Figure 3 ITU-T L.110 environmentally resistant optical fiber cable (Left), and installation work (Right)



veNet network. They were also able to build an environment that enables a patient information sharing application that utilizes NerveNet's data synchronization function with distributed databases, as well as an extension telephone application that uses a distributed SIP proxy function to run without an Internet connection.

Much Awaited Launch of Local Service

The same environmentally resistant optical fiber cables had already been laid between some of the major points in the preceding APT project (2019–2020), so the initial plan for this project was to extend and expand the range of these cables. However, when we visited the sites in December 2022 to inspect the condition of on-site installations and new prospective installation locations, we found that optical fiber cables laid on roadsides had been cut in multiple locations during civil reconstruction work that was performed after landslides hit the region during the rainy season. As a result, we reconsidered how these cables should be installed and the network configuration, and decided to lay the new optical fiber cables overhead using roadside utility poles, and on other routes, lay them exposed on the ground through mountain areas where there would be no human traffic.

The last of the optical fiber cables were successfully laid at the end of February 2024.

The NerveNet device was then connected, and it was confirmed that applications utilizing NerveNet's data synchronization function could be run locally even without an Internet connection. Local members also developed three web applications of their own: an open source EHR (electronic health record) system called “Bahmni,” an electronic building permit archive system called “e-BPAS,” and a learning management system based on Moodle to facilitate learning in major public schools (Figure 4)

Dullu to Begin Autonomous Operations

The network constructed for this project was transferred free of charge to the Dullu Municipal Office and its operation is already underway as a Public Private Partnership (PPP) project in cooperation with a private internet service provider (ISP) company. The Dullu Municipal Office will lease the network to the ISP for the next 20 years, and the ISP will use the network as an access line while employing local personnel for operation and maintenance to ensure profitability and sustainability. After the handover, we visited the then Prime Minister of Nepal, Pushpa Kamal Dahal, to report on the project, and the Prime Minister expressed his gratitude for our dedication to the project's execution and contribution to improving the living standards of the Nepalese people.



Figure 4 Applications developed in this project (Top): EHR (Electronic Health Record) System “Bahmni” (Middle): Electronic building permit archive system (e-BPAS) (Bottom): e-Learning system based on Moodle

Through these activities, we have been able to establish a success example where NICT technology can continue to be implemented and operated as network infrastructure in the mountains of Nepal. We would like to express our sincere gratitude to the KDDI Foundation, OCC Corporation, Global Plan Inc., Nassua Solutions Corporation, ICT4D Nepal, the Dullu Municipal Office, and the Ministry of Communication and Information Technology of the Government of Nepal for their generous support in moving this project forward.



Report on the Tongali Business Plan Contest 2024 (Cooperation Competition)

Entrepreneur Promotion Office, ICT Deployment and Industry Promotion Department

The Entrepreneur Promotion Office of the ICT Deployment and Industry Promotion Department organizes a NICT Accelerator Program designed to discover and foster next-generation ICT professionals, including high school students, technical college students, university students, and graduate students who are interested in ICT-based businesses, and to support their business expansion. The program's goal is to solve regional issues and revitalize the economy by supporting local ICT startups.

The program discovers promising entrepreneurs with the participation of ICT mentors who are venture capitalists and entrepreneurs at local cooperation competitions, provides mentoring and refines their business plans. To provide opportunities to present their achievements, the Entrepreneurs' Koshien (for students) and the Entrepreneurs' Expo (for young entrepreneurs) are held.

The Tongali Business Plan Contest 2024 was held on Saturday, June 15, 2024 at the Chikusa Playhouse in Nagoya City as a NICT Accelerator Program's cooperation competition in the Tokai region. Sixteen finalist student teams participated in the contest and presented their business plans with great enthusiasm. It was very impressive to see how they used their own experiences to take on problems that had been difficult to deal with in the past. Also, many presentations incorporated actual research being conducted at universities and graduate schools into their business plans. In addition, stylish touches seen throughout the contest, such as the use of background music, smoke, and lighting when the contestants took the stage, and the broadcast of a promotional video of their presentations, were appropriate for a business contest



Members of the NICT Prize-winning team with their ICT mentor (center right in the photo)

for students.

At the contest, the NICT Prize (the right to participate in the Entrepreneurs' Koshien) was awarded to the team that presented "A Magnetoencephalograph for Everyone"—a magnetoencephalograph is a terminal care device that can be used by anyone to continue living in their own way. The NICT award-winning team will refine its business plan through mentoring with the ICT mentor. We are looking forward to seeing how the team members have grown at the Entrepreneurs' Koshien to be held in March 2025.

*The final contestants for the Entrepreneurs' Koshien are scheduled to be determined around February 2025.

NICT NEWS Column

Mr. WATANABE, State Minister for Internal Affairs and Communications, Exchanges Views with People Involved in Startups at Hokkaido University

On Monday, June 3, 2024, Mr. WATANABE Koichi, State Minister for Internal Affairs and Communications, exchanged opinions at Hokkaido University with people from the university involved in startups.

The event brought together people involved in startups, including Mr. YAMAISHI Naoya, an academic researcher at the university's Graduate School of Engineering, who won the Minister for Internal Affairs and Communications Award at the 2022 Entrepreneurs' Koshien while he was still a student at the Hokkaido University Graduate School of Engineering; Dr. TOMIOKA, an associate professor at the university's Graduate School of Information Science and Technology, who won several special awards from partner companies at the Entrepreneurs' Expo that same year; Mr. HOSHIKAWA of OOKUMA DIAMOND DEVICE Co., Ltd., a startup from the university; staff members from the university's Institute for the Promotion of Business-Regional Collaboration, and others. They discussed related details as well as their enthusiasm about their respective projects.



State Minister WATANABE Koichi for Internal Affairs and Communications (left) shaking hands with Mr. YAMAISHI Naoya (right)

With State Minister WATANABE Koichi for Internal Affairs and Communications, the participants had a friendly but lively discussion about what is needed to revitalize Hokkaido and Japan.

The Japan Industrial Technology Awards were established in 1972 to recognize companies and groups that have made outstanding achievements in the development and practical application of innovative large-scale industrial equipment and structures that have been put to practical use each year as well as of advanced technologies. The awards are presented to those whose achievements have contributed to the development of industry and society.

The MAEJIMA Hisoka Awards were established in 1955 to commemorate the achievements of the founder of the postal service in Japan, MAEJIMA Hisoka, and to pass on and expand his spirit. Since then, the awards have been presented annually to those who have made significant contributions to the progress and development of the information and telecommunications business (including the postal service), and broadcasting business.

Prime Minister's Award of the 53rd Japan Industrial Technology Awards

- Institute of Physical and Chemical Research (RIKEN)
- National Institute of Advanced Industrial Science and Technology (AIST)
- National Institute of Information and Communications Technology (NICT)
- Osaka University (OU)
- Fujitsu Limited (Fujitsu)
- Nippon Telegraph and Telephone Corporation (NTT)

● **Awarding organization:** NIKKAN KOGYO SHIMBUN,LTD.

● **Awarded for:** Release of an ultra-high performance computing platform enterprise cloud using superconducting quantum computers

● **Date:** April 3, 2024

Receiver's comment: We are very honored to receive the Prime Minister's Award at the

53rd Japan Industrial Technology Awards. For quantum computers to be truly useful in the world, their performance must be further improved. We will continue research and development efforts so that NICT's technology can contribute toward improving the performance of superconducting quantum computers.



Hirokata Terai from NICT, third from the left. Photo by: NIKKAN KOGYO SHIMBUN,LTD.

Tsushinbunka Association, The 69th MAEJIMA Hisoka Awards

- UMEZAWA Toshimasa Senior Researcher, Optical Access Technology Laboratory, Photonic ICT Research Center, Network Research Institute
- YAMAGUCHI Yuya Senior Researcher, Optical Access Technology Laboratory, Photonic ICT Research Center, Network Research Institute
- YAMAMOTO Naokatsu Associate Director General, Photonic ICT Research Center/ Director of Advanced ICT Device Laboratory, Network Research Institute

● **Awarded for:** Technology to realize ultra-high speed and highly integrated optoelectronic conversion devices that provide the basis of high-capacity wired and wireless convergence communication

● **Date:** April 11, 2024

Receiver's comment: The Optical Access Technology Laboratory's research on ul-

search Institute

- KANNO Atsushi Executive Researcher, Optical Access Technology Laboratory, Photonic ICT Research Center, Network Research Institute / Professor, Department of Electrical and Mechanical Engineering, Nagoya Institute of Technology
- AKAHANE Kouichi Director of Optical Access Technology Laboratory, Photonic ICT Research Center, Network Research Institute

tra-high speed and highly integrated optoelectronic conversion devices, which are key components for realizing massive integrated all-band ICT hardware technology, has been highly evaluated. We believe that the Advanced ICT Device Laboratory was instrumental in the research and development of these devices. We would like to extend our appreciation not only to the staff on-site, but



From left KANNO Atsushi, YAMAGUCHI Yuya, AKAHANE Kouichi, UMEZAWA Toshimasa, and YAMAMOTO Naokatsu

also all those who have cooperated and supported maintenance and development of the laboratory.

- **SATO Kohei** Senior Innovation Coordinator Standardization Promotion Office, Innovation Promotion Department

● **Awarded for:** Longstanding contributions to standardization in the field of wireless communications at ITU, 3GPP and APT

● **Date:** April 11, 2024

Receiver's comment: It is a great honor for me to receive the MAEJIMA Hisoka Award for 2023. I am aware that by receiving this award, I am expected to not only continue

making contributions to standardization activities, but also to pass on the knowledge and know-how I have accumulated over many years of carrying out standardization activities.

With "passing on wisdom" in mind, I will continue to do my best to contribute to the activation and facilitation of standardization activities in the Asia-Pacific region.





NICT NEWS 2024 No.5 Vol.507

Published by **Public Relations Department, National Institute of Information and Communications Technology**
Issue date: Oct. 2024 (bimonthly)

4-2-1 Nukui-Kitamachi, Koganei, Tokyo

184-8795, Japan

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ISSN 2187-4050 (Online)