

Second Digital Observatory Forum

Progress on Digital Observatory Technologies through Use of Generative AI and Prospects for Supply Chain Resilience

#Co-creation and Open Innovation #Regional Revitalization #IoT/Data Utilization

Highlight

Amid rising global uncertainties that include conflict and trade friction, social and economic activities have become subject to more diverse and complex risks. The University of Tokyo launched the Digital Observatory Research Initiative in April 2023. Through collaborative research with this organization, Hitachi, Ltd. is conducting research and development across a variety of different fields, developing digital observatory technologies that combine generative AI with the observation and analysis of real-world data. The goal is to assess societal risks through the observation and analysis of a wide range of data on social and corporate activity around the world and to identify warning signs.

This article presents a summary of the presentations and a discussion by a panel of experts at a forum held on March 17, 2025, the second such forum to be held and a follow-up to the inaugural event held to mark the launch of the digital observatory in 2023.

Welcoming Address

The forum commenced with a welcoming address from the institute head, Masaru Kitsuregawa, distinguished professor at The University of Tokyo who spoke about the analysis of global supply chains that the institute is undertaking in partnership with government agencies and other Japanese research institutions. In addition to explaining how the institute is seeking to improve the accuracy of its risk assessment and identification through a process of trial and error that includes reviewing which data to observe and making use of generative artificial intelligence (AI), he also had the following to say about the nature and significance of this research.

“Understanding what is happening in supply chains and analyzing their risks is an extremely important task for a manufacturing nation like Japan. However, factors including the inter-disciplinary nature of the work and the need to acquire large amounts of data for analysis mean that it is not something that researchers or universities can undertake on their own. We need the help of others, including Hitachi, as well as the participation of academics from a wide range of the university’s faculties. In my role as director of the institute, I am conscious of how the scale of the work is progressively expanding. In keeping with the university’s principles of diversity and inclusion, we are also analyzing data on people with handicaps to determine what makes an organization inclusive of disability. As each of the research teams will be telling you about their work, I welcome you to hear what they have to say.”

This was followed by a greeting from the forum co-host, Jun Abe, Executive Vice President and Executive Officer at Hitachi, Ltd. He had the following to say about the background to the research being done by The University of Tokyo and Hitachi on generative AI and digital observatory technologies.

“Hitachi has a long-standing involvement in the database and storage businesses going back to the commercialization of the first database created in Japan and we have also partnered with The University of Tokyo on joint research in these fields. In addition to the rollout of the Hitachi iQ solution for AI infrastructure that supports the corporate use of generative AI and involves collaborative creation with NVIDIA, our work on generative AI also includes use of the technology to support frontline workers. The research being undertaken at the Institute for Digital Observatory is an industry-academia partnership between Hitachi and The University of Tokyo that also involves the government. My hope is that this will lead to the creation of an ecosystem for the use of data that will foster AI research, and by doing so will strengthen the industrial competitiveness of Japan.”



Masaru Kitsuregawa
Director, The University of Tokyo
Institute for Digital Observatory



Jun Abe
Executive Vice President and Ex
ecutive Officer, Hitachi, Ltd.

Research Presentations

The University of Tokyo Institute for Digital Observatory is made up of a research group that works on platforms for the collection and archiving of data and another that works on putting data to use. The latter is made up of eight teams, each of which researches a different topic. The topics are global supply chain (GSC) economics, media analysis, diversity, global social risk analysis, finance and security analysis, legal and political studies, the analysis of data on social activities, and food security. In the research presentations that followed the welcoming address, a representative of each team came on stage to report on their accomplishments to date.

(1) How Research at the Digital Observatory Seeks to Make Supply Chains more Resilient

Itaru Nishizawa, CTO, and head of the Research & Development Group at Hitachi, Ltd., explained how joint research between The University of Tokyo and Hitachi being undertaken through The University of Tokyo Institute for Digital Observatory is developing techniques aimed at making supply chains more resilient. This work consolidates and analyzes a wide range of data from corporate and other sources to visualize risks and identify warning signs. Recognizing that the lack of visibility into second-tier and lower level suppliers is an especially significant risk in the supply chain, the presentation explained how they have been able to highlight vulnerabilities in the supply network, having developed a technique that uses generative AI to identify the manufacturing sites of these second-tier and lower-level suppliers based on part names and open data.

The presentation concluded by reporting on how Hitachi has provided a test environment for large language models (LLMs) to the Komaba Open Laboratory at The University of Tokyo that is capable of running leading Japanese-language LLMs. CTO Nishizawa also expressed the hope that collaborative creation with The University of Tokyo that includes use of generative AI will lead to improvements in supply chain resilience and the creation of new businesses.



Itaru Nishizawa
CTO, General Manager of the Research & Development Group, Hitachi, Ltd.

(2) Overview of The University of Tokyo Institute for Digital Observatory and Platform for Observation of Social Activities

Professor Masashi Toyoda of the Institute of Industrial Science at The University of Tokyo gave an overview of The University of Tokyo Institute for Digital Observatory and described the work being done by its core team. He explained that the goal of the institute is the collection and analysis of data and its translation into value to address risks that are becoming increasingly diverse and severe. The way it has been set up allows for research with participation by eight humanities and science faculties at The University of Tokyo and the Research & Development Group at Hitachi. Activities include investigating ways of providing information on the results of its work in partnership with public institutions and relevant government agencies such as the Ministry of Economy, Trade and Industry and the Ministry of Agriculture, Forestry and Fisheries of Japan.

The three pillars of its research are the investigation, collection, and systematization of information on risks; risk detection, identification, and early warning; and risk assessment. The core team led by Professor Toyoda is working on a platform that will be able to observe a wide variety of social activities. He described its two main systems, a supply chain visualization and analysis system that uses data from the customs clearance records of international industry and a system that uses an LLM to detect and describe anomalous activities found in trade statistics data, and the analysis work that the institute is doing to ensure the reliability supply of agricultural produce.



Masashi Toyoda
Deputy Director, The University of Tokyo Institute for Digital Observatory Professor, Institute of Industrial Science, The University of Tokyo

(3) Generation of Predictions and Explanations of Armed Conflict Risk from Textual Information Sources

Professor Yusuke Miyao of the Graduate School of Information Science and Technology at The University of Tokyo, who leads the media analysis team, gave a presentation on the joint research they are doing with the team analyzing the risks for global society led by Professor Takuto Sakamoto of the Graduate School of Arts and Sciences, The University of Tokyo. To provide background to their work, he started by explaining how global supply chains are exposed to diverse risks that include armed conflict and that early risk detection and impact analysis are becoming increasingly important. Professor Sakamoto's group is responsible for defining and collecting data on armed conflicts and other risk events from a social sciences perspective while Professor Miyao's group, which specializes in natural language processing, is studying ways of automatically detecting and predicting risk events from news and other text and then automatically generating a description of what their consequences will be. They have been investigating the use of generative AI to improve techniques for the automatic generation of explanations. Professor Sakamoto's group is working on ways of identifying the warning signs of armed conflict and predicting them in advance. By combining their work, they hope to build a comprehensive system that can automate the detection, prediction, and explanation of risks.



Yusuke Miyao
Professor, Graduate School of Information Science and Technology, The University of Tokyo

(4) Pre-emptive Identification of Supply Chain Risks Due to Trade Regulation

Professor Kazuyori Ito of the Graduate Schools for Law and Politics at The University of Tokyo presented a method for early identification of the risks that government regulations on trade pose to corporate supply chains from the analysis of textual information in government publications and the media. The results of an analysis conducted on a past investigation into the trade restrictions imposed by the USA using Section 232 of the Trade Expansion Act under the first Trump administration found a rise in the occurrence of relevant keywords on news sites before and after the measures were introduced, indicating the potential for pre-emptive detection. The goal is to create mechanisms that companies can use for comprehensive monitoring to better prepare themselves for trade risks, scoring risk based on factors such as which keywords are appearing, their frequency, and the risk level in different phases.

Next, Visiting Associate Professor Kotaro Shiojiri took the stage to talk about early-stage research into using generative AI to identify warning signs. This has involved testing that uses the Gemini generative AI and the “bag-of-words” technique for natural language processing to predict when threats are genuine. This demonstrated potential for further development, with a certain level of predictive accuracy obtained using only small quantities of data. They are also working on measures for improving the accuracy of risk identification using generative AI, including the extraction of words indicating whether threats are genuine from keyword analyses of report documents.



Kazuyori Ito
Professor, Graduate Schools for
Law and Politics, The University
of Tokyo



Kotaro Shiojiri
Visiting Associate Professor, Gra
duate Schools for Law and Politic
s, The University of Tokyo

(5) UI for Analysis of Shipping and Trade Data

Associate Professor Rie Yamaguchi of the Graduate School of Information Science and Technology at The University of Tokyo, leader of the finance and security analysis team, spoke about the development of a user interface (UI) for understanding shipping and other logistics that her team is working on. As most international freight goes by sea, with marine transportation being especially important for Japan, Associate Professor Yamaguchi's team has been analyzing shipping movements using real-time data from the Automatic Identification System (AIS) for ships. AIS works by combining a wide variety of information, including Global Positioning System (GPS), customs, and weather data. It has become a useful means of keeping track of trading patterns, including, in recent years, being able to provide an indication of what cargo ships are carrying. Analyses that link AIS data to shipping news have shown the ability to identify patterns in shipping movements and anomalous events. Future plans include work on the automatic collection of news, AIS, and other data, and on algorithms for presenting their consequences visually.



Rie Yamaguchi
Associate Professor, Graduate S
chool of Information Science and
Technology, The University of To
kyo

(6) Analysis of Global Supply Chains to Strengthen Food Security and Spatial and Genetic Analyses of Risks to Agricultural Production

Professor Hiroyoshi Iwata of the Graduate School of Agriculture and Life Science at The University of Tokyo appeared for the food security team. He explained how the three main areas they are working on are the analysis of global supply chains and spatial and genetic analyses of risks to agricultural production, with this work taking place against a background that includes Japan's low level of food self-sufficiency (producing less than 40% of its own food in calorie basis), climate change, and a changing social environment. On the topic of global supply chain analysis, he highlighted how much Japan relies on food imports from places like China and America by Asian international input output table to show the import-dependence of Japan's food supply. For the spatial analysis of risks to agricultural production, the team is developing a system for visualizing natural disaster risks and presenting actual disaster damage that works by integrating data collated by agricultural cooperatives into a geographic information system (GIS). Their work on genetic analysis, meanwhile, seeks to develop crop strains that are resilient to risks such as climate change by focusing on data-driven selective breeding and by matching data on damage due to natural disasters with strain characteristics and genetic information.



Hiroyoshi Iwata
Professor, Graduate School of Agriculture and Life Sciences, The University of Tokyo

(7) General Equilibrium Analysis of Supply Chain Resilience

Professor Taiji Furusawa of the Graduate School of Economics at The University of Tokyo, who leads the global supply chain economics team described the progress they have been making in their work on global supply chain resilience and impacts on the global environment. Their research practices include building models based on general equilibrium analysis and trade theory, the use of world input-output tables (also known as inter-industry relations tables) and other data to determine the relationships between trade costs and volumes, and counterfactual analyses of public policy. Current work involves the analysis of how supply chain vulnerabilities and policy shocks such as the Trump administration tariffs impact each nation's production, income, and CO₂ emissions. Future plans include the development of bidirectional models that consider the countervailing effects of factors such as the increased frequency of natural disasters due to climate change. Another topic that the team intends to pursue is research into the resilience of urban design and changes in the movement of people in cities during a disaster.



Taiji Furusawa
Professor, Graduate School of Economics, The University of Tokyo

(8) Foundational Development for Estimating the Long-term Flow-on Effects that Both Climate Change Itself and Adaptation Measures Have on Socioeconomic Activity

Professor Akiyuki Kawasaki of the Institute for Future Initiatives at The University of Tokyo, who leads the team working on the analysis of data on social activities, described the work they are doing on a foundational framework for elucidating the long-term flow-on effects that climate change and measures for adapting to climate change will have on socioeconomic activity, especially in the Global South. To enable detailed impact assessments at a regional level, this involves collecting data using a bottom-up approach and visualizing the indirect and long-term economic effects of measures for climate change adaption and investment in disaster prevention in each region. Professor Kawasaki explained how this involves the modeling of mechanisms whereby adaptive measures for dealing with flood damage foster a virtuous cycle in regional socioeconomic activity by driving changes in public behavior and risk awareness. He also described how they are developing a framework for using the predictions of the Intergovernmental Panel on Climate Change (IPCC) to quantify the effects of these measures. As the model has attracted interest from other institutions both in Japan and overseas, they are planning further enhancements in readiness for its deployment.



Akiyuki Kawasaki
Professor, Institute for Future Initiatives, The University of Tokyo

(9) Criteria for Organizations to be Inclusive of Disability: Targeted at Companies, Universities, and Public Agencies

Professor Shinichiro Kumagaya of the Research Center for Advanced Science and Technology at The University of Tokyo, who leads the diversity team, described how past studies of companies, universities, and public agencies have found that organizations where diversity fosters greater productivity and well-being tend to have high levels of psychological safety, and that leadership humility (the level of accuracy of the leader’s self-awareness) is one of the factors behind this. The University of Tokyo has leveraged these findings in its measures for diversity and inclusion and is working on the development of an inclusion monitoring system and support tools that use digital technology, utilizing resources such as surveys of psychological safety at the university and data from interviews with disabled people who work or study there. They are also working with the Ministry of Justice on surveying prison inmates and staff to improve working conditions for staff, prevent inappropriate treatment in prisons, reintegrate inmates into society after their release, and prevent reoffending. Plans include the use of data analysis to propose improvements. The diversity team intends to continue its evidence-based efforts to advance diversity, equity, and inclusion (DEI) in industry, academia, and government.



Shinichiro Kumagaya
Professor, Research Center for Advanced Science and Technology, The University of Tokyo

Panel Discussion

Expectations and Prospects for Data and Generative AI to Boost Supply Chain Resilience

The panel discussion brought together experts in supply chain practice and policy from industry, government, and academia to discuss “expectations and prospects for data and generative AI in supply chain resilience.”

[Panelists]

Shinya Kabashima
Director for Strategic Analysis of Economic Security, Economic Security Policy Division, Trade and Economic Security Bureau, Ministry of Economy, Trade and Industry



Teruyoshi Fujiwara
Chairperson, Automotive and Battery Traceability Center Association, Inc.



Masashi Murayama
Executive Advisor, Value Integration Division, Hitachi, Ltd.



Itaru Nishizawa
CTO, General Manager of the Research & Development Group, Hitachi, Ltd.



Masaru Kitsuregawa
Director, The University of Tokyo Institute for Digital Observatory

[Moderator]



Masashi Toyoda
Deputy Director, The University of Tokyo Institute for Digital Observatory

Supply Chain Analysis Essential for Economic Security and Traceability

Toyoda : I will start by inviting the panelists to introduce themselves and speak about the issues of concern.

Murayama : I have worked for many years in the field of hardware procurement. The challenge for procurement departments is to maintain the flow of materials and a resilient and sustainable supply chain. Three factors that I see as important for achieving these goals are the ability to respond rapidly to changes, the maintenance of an uninterrupted chain and flow of goods, and the ability to cope with and adapt to external factors such as national laws and geopolitical change. In particular, we work with partners to help us keep track of risks in the second-tier and lower levels of the supply chain that Nishizawa-san spoke of earlier.

Kabashima : The Trade and Economic Security Bureau of the Ministry of Economy, Trade and Industry where I work was established in July 2024 to deal with matters of economic security. This is a field where the government passed the Act on the Promotion of Ensuring National Security through the Integrated Implementation of Economic Measures (Economic Security Act) in 2022, with initiatives that include improvements to the resilience of supply chains for goods of special significance such as semiconductors and batteries and programs for fostering key technologies to help ensure economic security. Meanwhile, the Ministry of Economy, Trade and Industry has formulated its Action Plan to Strengthen Supply Chain and Technological Basis for Economic Security and is working on measures to assist industry (promotion), to protect industry (protection), and to establish international frameworks and coordinate action by both the public and private sectors (partnership). If we are to strengthen economic security, it is vital that we make ourselves indispensable as a nation and strengthen our autonomy, a prerequisite for which is that we identify and analyze the threats and risks to our industry and technological base. As the collection and use of data are essential to the analysis of threats and risks, including, for example, surveys of the impacts that supply chain vulnerabilities and geopolitical risk have on supply chains, I have high hopes for the work being done by the institute.

Fujiwara : The activities of the Automotive and Battery Traceability Center where I serve as Chairperson include safe and neutral traceability services, collaboration with vendors and industry organizations, and the establishment of platforms for exchanging data with overseas. As the automotive supply chain has a global spread and encompasses a range of industries, making it difficult for individual companies or industries to track and disclose information, a service was launched in 2024 as one of the early use cases for the Ministry of Economy, Trade and Industry's Ouranos Ecosystem initiative for cross-industry data exchange. We currently provide a service for calculating the carbon footprint of battery products across the entire supply chain. This involves operating the distributed platform of the Ouranos Ecosystem in tandem with industry-specific traceability management systems and exchanging data in ways that maintain confidentiality. In the future, we plan to contribute in ways that include expanding our trace capabilities beyond supply chains to encompass value chains, extending the range of products covered to include every part of the vehicle (not just batteries), conducting vehicle life cycle assessments, managing inventory and production during abnormal times, and creating value across all steps in the life cycle of batteries. The challenges include technology development and the systems and structures we need to put in place to achieve this.

Nishizawa : Hitachi's Research & Development Group recognizes that improving supply chain resilience is one of the challenges of expanding business globally. Three factors that are important for achieving this are to clarify where risks exist, to minimize the loss of capabilities that occurs in times of crisis, and to return rapidly to the normal mode of doing things. As such, we hope to build ecosystems in collaboration between industry, academia, and government as we proceed with our research and development.

Challenges of Risk Visualization and Use of Generative AI

Toyoda : Our research institute has been working on supply chain research and development for two years now and this has made us conscious of the difficulties that the field poses. What are your own thoughts on this?

Murayama : Speaking from the perspective of procurement practice, dealing with the breadth and depth of supply chains is one of the difficulties. The extent of participation is expanding year by year, with a scope that encompasses not only the goods themselves, but also things like the people who make them and information security. Likewise with depth, not only the materials used for making parts, but also catalysts, additives, and other consumables can be an Achilles' heel for procurement. We are currently making use of digital technologies to find global measures for dealing with such materials.

Kabashima : Motivated by economic security, the Ministry of Economy, Trade and Industry is working on the visualization of supply chains and their risks, such as the use of trade statistics and other data to analyze supply chain vulnerabilities and other weaknesses. The challenges include obtaining the required levels of resolution in the data, deciding on coverage, and achieving real-time performance. Moreover, analyzing supply chain vulnerabilities requires the integration of diverse forms of data, including not only what is happening with trade, but also geopolitical risk, distribution routes, and inter-corporate relationships. We also see a need to link the evaluation of past data to predictions of the future.

Fujiwara : I see the challenge of how to go about data sharing as being the same as the use of data. When calculating carbon footprints, for example, you need to identify all the production processes, materials, procurement routes, and so on. This makes it essential to protect trade secrets. Although we have put platforms in place that can guarantee neutrality as well as technical safety, we can expect the challenges to multiply as we expand the scope of traceability and assessment beyond batteries to encompass entire vehicles. In addition to a higher level of information security, the number of parts will also increase by an order of magnitude.

Kitsuregawa : In terms of combining data and generative AI, I have found what people have said today to be very interesting. It is also my impression that the reasoning processes of AIs are more complex than I thought. How do you tie together all the different things that are going on? One future topic that I anticipate for academia will be to draw on the knowledge acquired from the interdisciplinary collaborations that the Institute for Digital Observatory is engaged in and to use this knowledge to strengthen modeling and reasoning processes for verifying the reliability of the inferences that generative AI provide on the subject of societal challenges.

Kabashima : I feel that scope remains for making greater use of generative AI in the field of supply chain analysis in particular. As touched on during the research presentations given today, I see a place for using generative AI not only for the visualization of supply chains themselves, but also in applications such as analyzing their relationships with geopolitical risk.

Fujiwara : While I too have hopes for generative AI, the initial stages prior to practical use pose certain challenges. The first of these is the problem of data confidentiality and usability. While we currently reassure data providers by restricting the agreed level of data use to carbon footprints only, when large amounts of data are collected the potential grows for its use in things like development, for example. How do you get consensus on this? The second challenge is the problem of cost. Transforming data into a form that can be collected is costly in itself and this makes it intrinsically difficult for small and medium-sized businesses in particular to supply data unless an economic rationale can be established for doing so. Third, is the problem of talent. As an example, consider the development of a model for accurately calculating CO₂ emissions. Prior to the emergence of generative AI, this would have required people who combine expertise in IT with an understanding of global procurement and manufacturing processes. The difficulty in practice, of course, is that such people are rare.

Promoting Data Sharing through Both System Design and Technology

- Toyoda** : Given that the sharing and use of data also pose challenges for the research being done at the Institute for Digital Observatory, what are your thoughts on the creation of data ecosystems?
- Murayama** : While we are also conscious of the challenges that Fujiwara-san spoke of, you find no lack of forward-looking attitudes to information sharing when exchanging information with the people responsible on the operational side. A viable way forward, I believe, will be to start out by sharing and using data on the basis of a consensus forged between companies and industries that share common values, and then expanding progressively from there. I think awareness is spreading of the limits to what companies can do on their own and of the considerable benefits of sharing and coordination.
- Kabashima** : Overseas, the sharing of data for applications such as supply chain analysis is proceeding on the basis of partnerships between the public and private sectors, including academia. In Japan, I believe that considerable scope still remains for the exchange of data between government, bodies such as the Japan Organization for Metals and Energy Security (JOGMEC), companies, and research institutions.
- Nishizawa** : In 2019, Japan put forward the Data Free Flow with Trust (DFFT) concept as a means of encouraging the international exchange of data in ways that ensure trust, including respect for privacy, security, and intellectual property rights. As the sharing and use of data is also essential to enhancing the competitiveness of Japanese industry, I think it is important that we establish a unified platform through strong leadership.
- Kitsuregawa** : I have been researching the topic of data for many years and have dealt with numerous instances of large datasets. Given that their respective attitudes to data vary widely, it is important that data be handled in ways that suit the different domains. As with law-making efforts like the General Data Protection Regulation (GDPR) that applies to personal data, I expect that measures such as putting rules in place to cover the privacy of information will also encourage sharing. Combined with system design that considers data sharing from the earliest stages, I believe that progress on the sharing and use of data will require action both on technology and on the design of systems and structures.
- Toyoda** : Finally, I would ask each of the panelists to offer a few words.
- Murayama** : I hope we can work with all of you to advance digital observatory research while also conveying awareness of how important data is to getting generative AI to work effectively and to enhancing the sustainability of industry and of Japan as a whole.
- Kabashima** : Observing and analyzing society and equipping ourselves to deal with risks are among the objectives of this institute. These are very important to enhancing the resilience of Japan as a whole and my hope is that industry, academia, and government will continue to work together in close collaboration.
- Fujiwara** : While the exchange of data by the public and private sectors in the automotive and battery industries continues to pose challenges, the knowledge we obtain from overcoming these should prove useful in other sectors and industries. As I believe that research spanning digital observatory technologies and industries such as these will be essential to overcoming challenges, I ask that we continue working together on this in the future.
- Nishizawa** : The contributions of many different people will be needed to resolve the challenges raised during this discussion. In addition to academics, I would like to see what we can do about also creating opportunities for bringing students into the discussion.
- Kitsuregawa** : In manufacturing, production can be brought to a halt by the absence of a single small part and I hear people asking what we can do about this. While we are devoting our best efforts to research that seeks answers to this question, doing so only highlights to us the complexity of the underlying problem. As this makes it a field from which we can expect to see results, I look forward to your support in these endeavors.

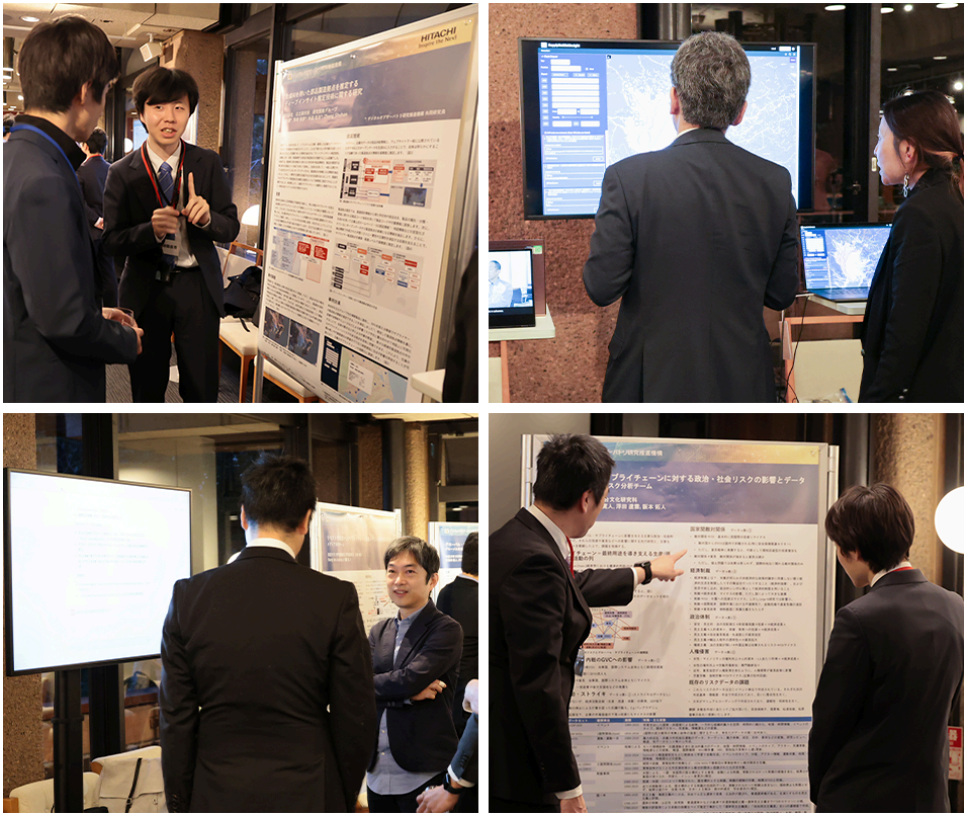
Closing Address

The program ended with a closing address by Nobuhito Saito, Executive Vice President of The University of Tokyo. After thanking the presenters, panelists, and audience, he went on to express his hopes for how activities such as data analysis can benefit from generative AI, a field that has made dramatic progress over the two years since the institute was established. He summed up by saying, “The institute has developed various analysis tools and systems by leveraging a vigorous exchange of views between industry, government, and academia. I look forward to your support in putting these to use in practical applications.”

A networking session held after the conclusion of the forum provided an opportunity for people to gather around the posters, each of which summarized the research work of one of the teams, and to explore collaboration between companies and institutions in areas ranging from the identification of the challenges and use cases of medium-to-long-term initiatives to their practical deployment and business creation. In addition to presenting research results, the posters also served as prompts for the people attending to share their views. The Institute for Digital Observatory intends to continue its work of using digital observatory technologies to monitor data and use it as a basis for uncovering risks and warning signs.



Nobuhito Saito
Executive Vice President, The University of Tokyo



Poster display at the second networking session held at the venue
[Exhibits by Hitachi (top row), exhibits by The University of Tokyo (bottom row)]

* Job titles and affiliations of speakers are current as of March 2025.

Hitachi Review

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