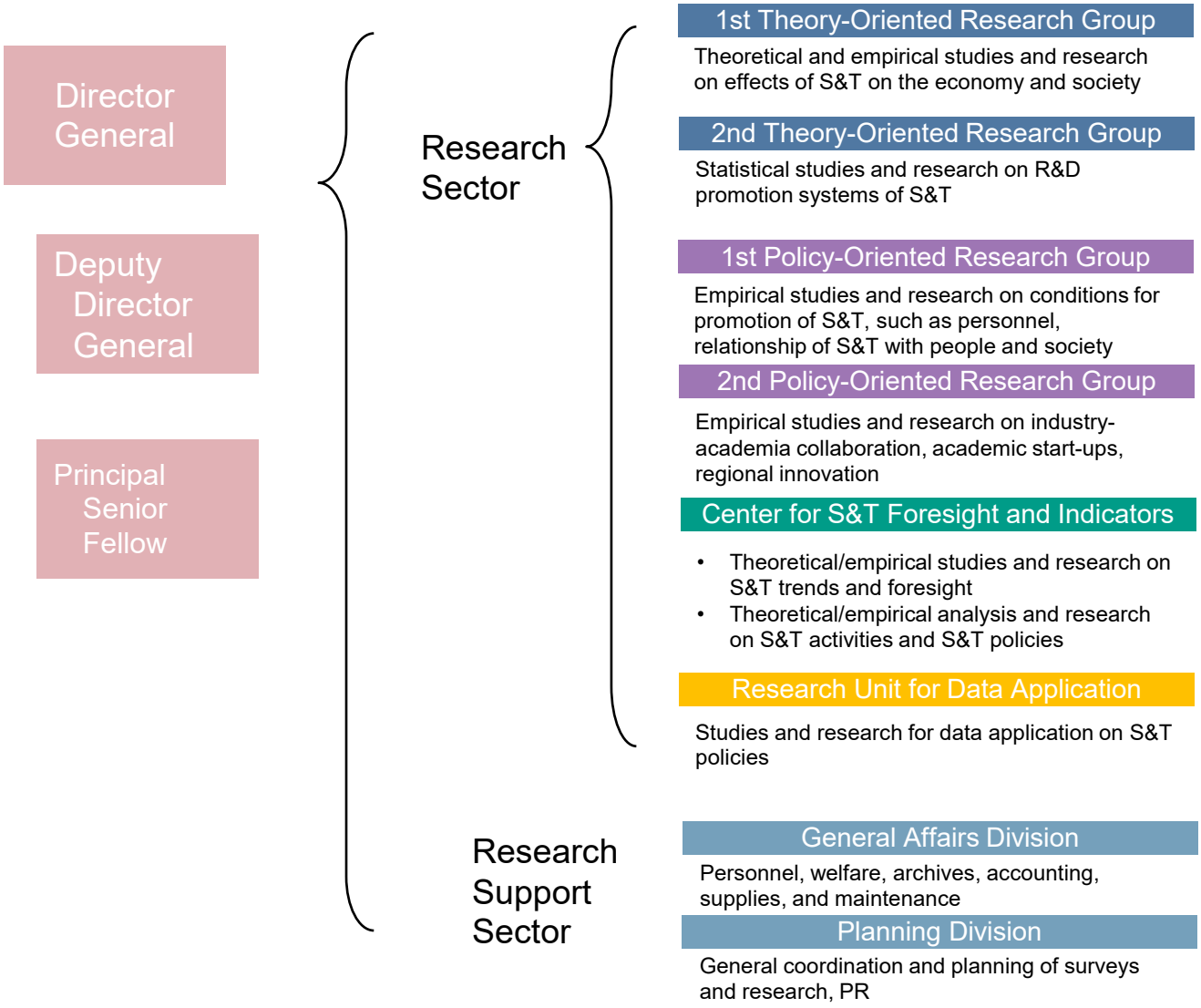
NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY POLICY

Ministry of Education, Culture, Sports, Science and Technology

Organization, Personnel and Budget

Staff Quota: 43, Budget: About 940 million Yen (as of April 2025)



Principal Senior Fellows are appointed because of the institute's need to work across areas.

History

Jul 1988	National Institute of Science and Technology Policy established. (restructured from the National Institute of Resources)
Jan 2001	Ministry of Education, Culture, Sports, Science and Technology (MEXT) established through administrative reform. NISTEP became an affiliated research institute of MEXT. Science and Technology Foresight Center established as a part of NISTEP.
Jul 2001	Relocated from the Common Building for Government Offices in Nagata-cho to the Postal Services Agency Building in Kasumigaseki.
Jan 2004	Relocated to the Ministry of Education, Culture, Science and Technology Building in Marunouchi.
Apr 2006	Research Unit for Science and Technology Analysis and Indicators established.
Jan 2008	Relocated to the East Wing of Central Government Building No. 7 in Kasumigaseki (Chiyoda-ku).
Jul 2013	Reorganized with broader remit.
Apr 2016	Reorganized with new group structure.
Apr 2021	Research Unit for Science and Technology Analysis and Indicators and Science and Technology Foresight Center merged to establish the Center for S&T Foresight and Indicators. Research Unit for Data Application established.

NISTEP's mission within MEXT

The National Institute of Science and Technology Policy (NISTEP) is a national research institute under the direct jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). NISTEP was established under the National Government Organization Act to play a role in the Japanese government's process of crafting policy aimed at promoting Japan's science and technology (S&T). Through its research on science, technology and innovation (STI) policy, NISTEP contributes to the effective and efficient development of STI policy grounded in evidence-based policymaking (EBPM).

NISTEP plays following three roles:

To contribute to evidence-based policymaking in order to strengthen Japan's research and innovation capabilities, while responding to changing research activities
To contribute to the advancement of science and technology policy research by being a hub for policy research and for cultivating researchers in the field of policy research
To contribute to deepening the public's understanding of STI policy by providing information such as research findings

Major Research Activities

In accordance with the 6th Science, Technology, and Innovation Basic Plan (approved by the Cabinet in March 2021) and the 5th Medium Term Plan of National Institute of Science and Technology Policy (April 2021), NISTEP engages in research activities mainly in the areas described below.

Research results are released through various channels including "NISTEP REPORT" series, "Research Material" series, "Discussion Paper" series, reports to governmental advisory councils as well as lectures and presentations at seminars and international conferences organized by NISTEP, and more.

- R&D and Innovation
- Human Resources in Science, Technology, and Innovation
- University-industry Collaboration and Regional Innovation/ Science and Technology and Society
- Science and Technology Indicators and Scientometrics
- Science & Technology Foresight and Trend Analysis
- Data-oriented Research on Promoting Science & Technology and Academia
- Science of Science, Technology and Innovation Policy / Situation Regarding Science and Technology

R&D and Innovation

It is essential to create economic and social value by generating demand and improving productivity through innovation to achieve sustainable development. To provide objective evidence that helps advance STI policy, NISTEP researches and analyzes innovation activities at enterprises as well as Japan's innovation system in order to gauge the current situation as well as trends.

◆ Measuring innovation: statistical research and analysis

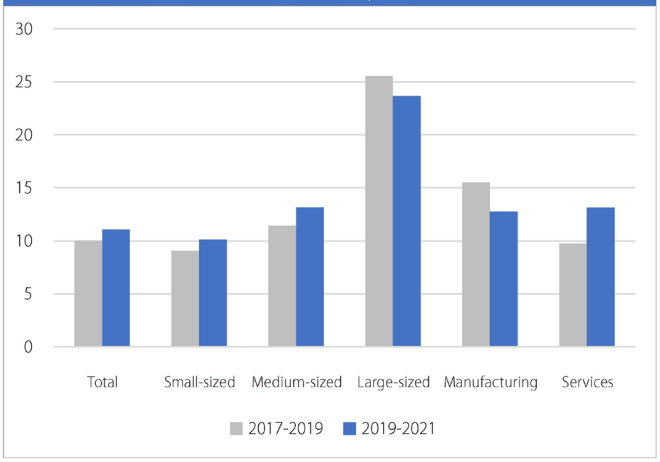
To aid in the planning, drafting, and advancement of STI policy, NISTEP carries out the Japanese National Innovation Survey, a government statistical survey (specific general statistical survey) in accordance with international standards. This survey is used to assess the state of innovation at Japanese enterprises and innovation activities as well as trends in this area. The survey results are provided to the Organisation for Economic Co-operation and Development (OECD), an international body, to be used internationally as benchmark data on Japan. The economic impact of the knowledge flow from academic research to industry is analyzed by linking enterprise-level and institution-level data to bibliographical information (e.g. patents and academic papers). Through this research NISTEP advances the understanding of the innovation system and the innovation process that are the subject of, and background behind, STI policy. At the same time, NISTEP is also seeking to improve the measurement of innovation.

Proportion of firms realising product innovations

Introducing new or improved products or services to the market

- **Of the target population (448,348 enterprises), 11% of firms (49,631 enterprises) realised product innovations.**
- **In the services sector, this figure was 13%, an increase of around 3 percentage points compared with the previous round of survey.**

Figure 2.1 Proportion of firms realising product innovations (2019–2021): Ratio of relevant firms (%) (to all enterprises)



Source: Japanese National Innovation Survey 2022, National Institute of Science and Technology Policy. Statistical Table 15.

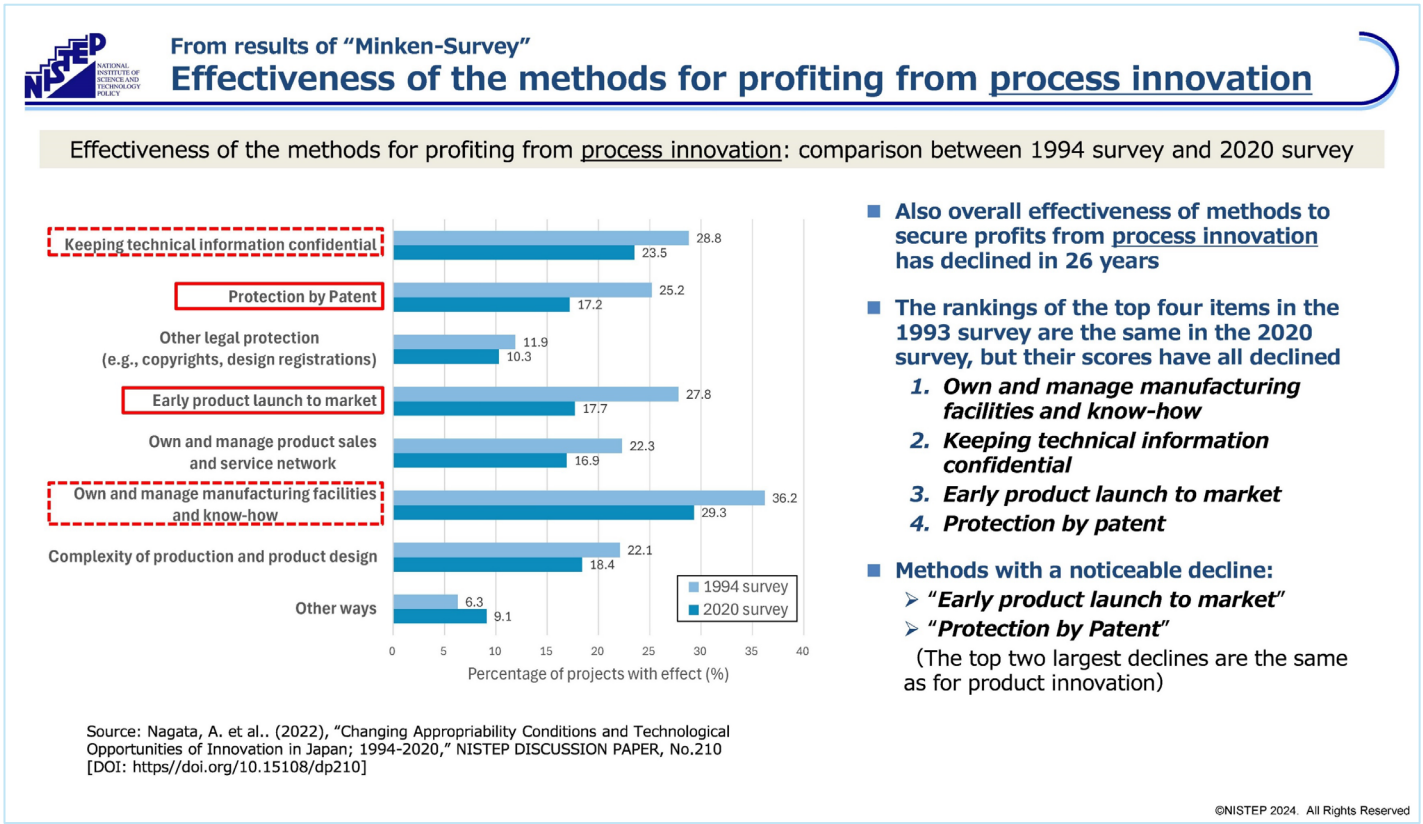
Findings

- Part of the reason for the changes observed in the services sector could be the reaction to COVID-19 and its effect/impact on business activities.
- By economic activity, the proportions of relevant firms increased significantly, particularly in the "Information and communications" and "Accommodations, eating and drinking services" sectors.

Source: NISTEP, " Report on the Japanese National Innovation Survey 2022 (J-NIS 2022) ",NISTEP REPORT, No200., 2023.9 DOI:[https://doi.org/10.15108/nr200]

◆ R&D in firms

The innovation process is composed of the interaction among companies, governments, universities and public research institutions. From the standpoint of generating innovation, in formulating and advancing STI policy it is important to properly understand R&D activity trends not only in government, universities and public research institutes, but also in the private enterprises that shoulder about 70% of the R&D expenditures in Japan. NISTEP conducts the Survey on Research and Development Activities of Firms in the Private Sector. This large ongoing survey collects data on the R&D activities of business enterprises. It is a general statistical survey approved by the Minister for Internal Affairs and Communications pursuant to the Statistics Act. The findings of this highly reliable survey are used in crafting Japan's STI policy. NISTEP also conducts research aimed at gauging the effects and influence of interactions between business enterprises and universities as well as STI policy.



Source: Nagata, A. et al.. (2022), "Changing Appropriability Conditions and Technological Opportunities of Innovation in Japan; 1994-2020," NISTEP DISCUSSION PAPER, No.210
DOI: [https//doi.org/10.15108/dp210]

Human Resources in Science, Technology and Innovation

To cultivate and nurture human resources in science, technology and innovation and to ensure that research continues into the future, it is necessary to maintain an understanding of systems and career paths for researchers. Moreover, a clear view of the situation on the ground and of issues that affect career path development is required. To support policy to overcome career path challenges, NISTEP conducts surveys and provides analysis of issues affecting the profiles and career paths of the researchers who represent the future of science, technology and innovation in Japan.

◆ Research on STI career paths, diversity, and mobility

Increasing the flow of personnel (such as the mobility of researchers among institutions), creating environments that foster friendly competition, and ensuring diversity (such as by including female and foreign researchers) will set the stage for Japan's STI researchers to conduct research that yields excellent results. To accomplish this, the postgraduate educational system must cultivate doctoral-level talent that addresses globalization and the needs of industry. However, at present only limited information is collected about the path follow by those who have received a Ph.D., and there is no system for understanding how their abilities are being put to use in society.

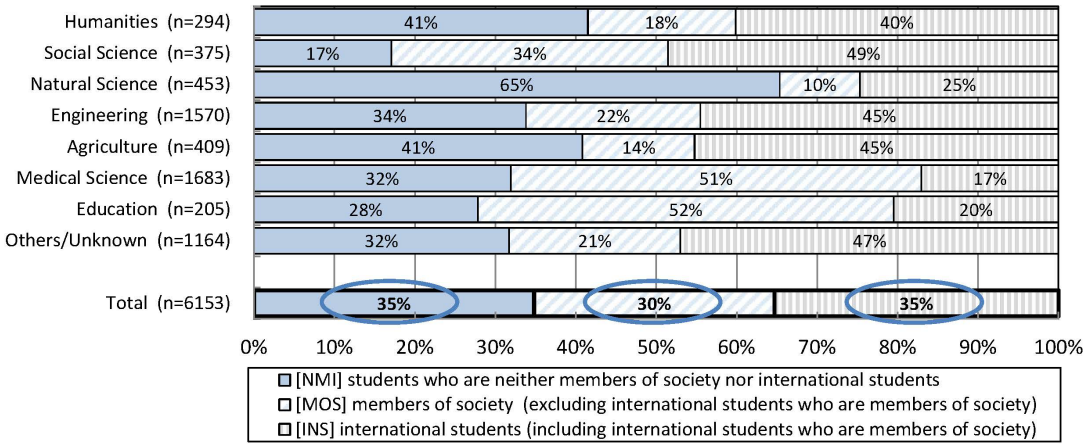
NISTEP is responsible for Japan Doctoral Human Resource Profiling (JD-Pro), an ongoing survey that collects information about the employment status and other aspects of the careers of Ph.D. holders. NISTEP also manages the Japan Graduates Database (JGRAD) to collect information from doctoral students and graduates.

3 categories about [Member of Society] and [International Student]

- In this presentation, the response is divided into 3 categories.
  - **NMI**: students who are neither MOS nor INS
  - **MOS**: member of society (≒ mature student) excluding international students
  - **INS**: international students including international students as MOS

  * MOS(member of society) are defined as people who have or had a job with recurring income, homemakers.
- Though the Ratios of [NMI], [MOS] and [INS] are generally similar across all research fields, the ratios depends on research field.

Share of 3 categories of response in each research field (FY2022 Survey)



Source: NISTEP, "Academic Year 2024 Survey on Career Awareness and Economic Situation to 1st year of Doctoral Students. - Survey from February 2024 to April 2024 –"

◆ Survey on employment and careers for postdoctoral fellows

NISTEP surveys employment and career paths of postdoctoral fellows at universities and public research institutes in Japan. The aim of the Survey of Postdoctoral Fellows Regarding Employment and Careers in Japan is to provide data for policymaking regarding training and encouragement of postdoctoral fellows. Conducted by MEXT every three years and covering universities and public research institutes, this survey is approved by the Minister for Internal Affairs and Communications as a general statistical survey under the Statistics Act, and NISTEP actively participates in collecting and analyzing data. Many governmental committees use the research outputs for purposes such as making science, technology, and innovation policy.

University-industry Collaboration and Regional Innovation

To achieve the required progress in STI, it is necessary to build appropriate systems and mechanisms. NISTEP researches and analyzes the state of government-university-industry partnerships, innovation activities, and other systems and mechanisms inside and outside of Japan so that it can contribute to the planning and drafting of policies and measures concerning S&T systems.

◆ University-industry collaboration and university startups

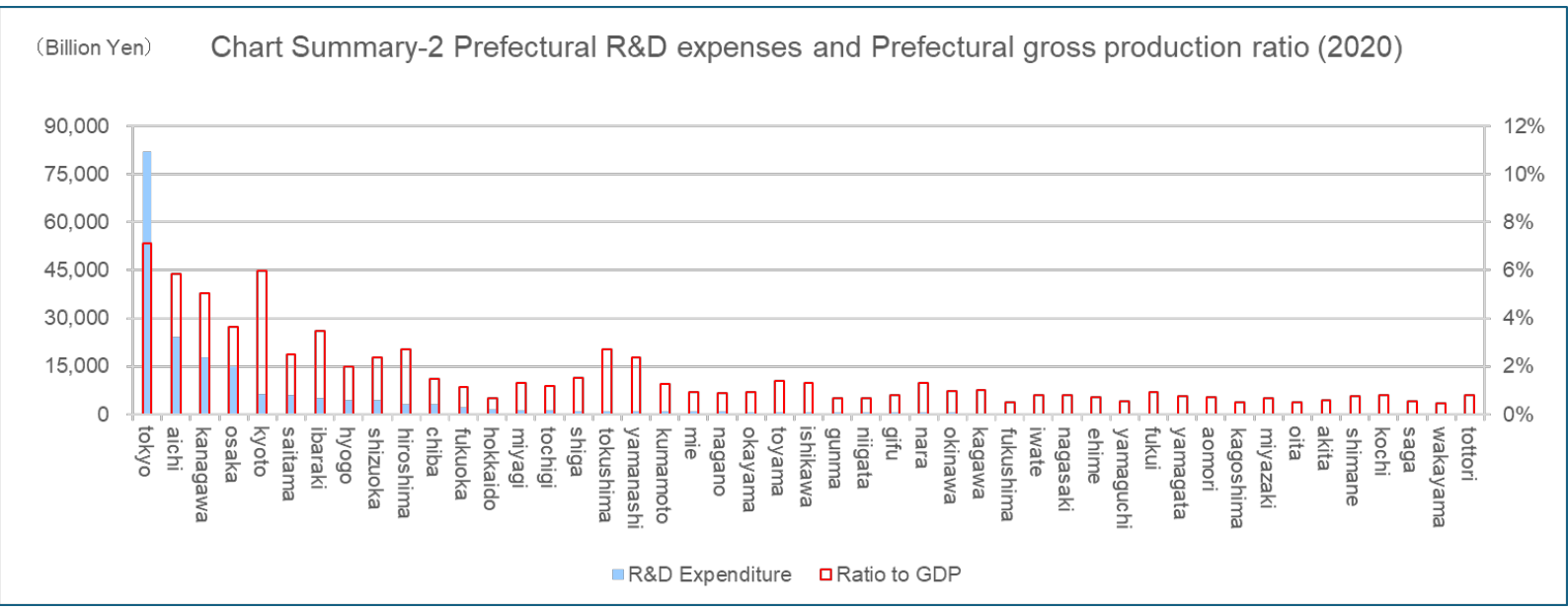
In order to revitalize innovation in Japan, promotion of university-industry collaboration and open innovation contributes significantly to making use of new ideas, knowledge, and techniques inside/outside of the organization.

Regarding university-industry collaboration, the government has decided a number of policies, including the formulation of support systems within universities. Application of those policies is driving innovation in many universities. To promote these efforts effectively, NISTEP researches industry-academia-government cooperation to monitor the situation, reveal issues and build up data.

University startups are vehicles for innovation using the outcomes of research conducted by universities and public research institutes. For this reason, NISTEP is surveying the founders and employees of university startups in order to gain clarity on the factors that lead young talent to become involved in university startups.

◆ Innovation-related activities at the regional level

Excellence in science and technology activities and innovation-related activities at the regional level are considered to be the basis of progress, diversification, and competitiveness of S&T at the national level. NISTEP conducts research into regional S&T indicators and their causal relationship with regard to regional innovation in order to create autonomous and sustainable innovation systems in each region.



Source: NISTEP, "Regional Science and Technology Indicators 2022", Research Material-344, No., 2024.10
DOI:[https://doi.org/10.15108/rm344]

Science & Technology and Society

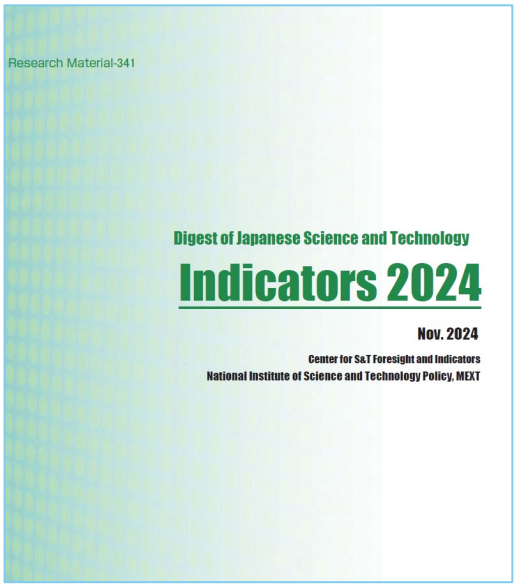
Bringing in the perspectives of users with diverse values is something that is indispensable for creating STI. Furthermore, gaining the understanding, trust, and support of society is a prerequisite for STI to meet the expectations of society. This is why it is necessary to deepen relationships through dialogue and collaboration with diverse stakeholders in order to advance co-creation. This dialogue enables NISTEP to conduct research on S&T literacy as well as grasping public attitudes to S&T. For example, in 2021 NISTEP conducted the “Public Attitudes to Science and Technology- Analysis of Determinants of Social Acceptance of New Technology” survey.

Science and Technology Indicators and Scientometrics

Quantitative data regarding S&T and their analyses are an indispensable foundation for formulating S&T policy and play an important role for grasping complex and diverse S&T activities, as well as for analyzing the effects and influences of S&T policies. Given that S&T activities are the process of producing knowledge, preparing quantitative data for this intangible process is challenging. In addition to this, the close linkage of S&T activities to various other activities makes the measurement of S&T activities and differentiating S&T activities from other activities technically difficult. NISTEP actively confronts the difficulties in this area, and that is why we are developing S&T indicators and conducting research in scientometrics in order to take application and analysis of quantitative S&T data to deeper levels.

◆ Science and Technology Indicators

“Science and Technology Indicators” is a basic resource for understanding Japanese science and technology activities based on objective and quantitative data. This resource classifies science and technology activities into five categories, such as R&D Expenditure; R&D Personnel; Higher Education and S&T personnel; Output of R&D; and Science, Technology, and Innovation and shows the state of Japanese science and technology activities with approximately 170 indicators. The report is published annually and shows the latest results of the analyses of scientific publications and patent applications conducted by the NISTEP.



Source: NISTEP, "Japanese Science and Technology Indicators 2024", Research Material-341, 2024. DOI:[https://doi.org/10.15108/rm341]

◆ Scientific paper benchmarking

Benchmarking scientific research and Japanese

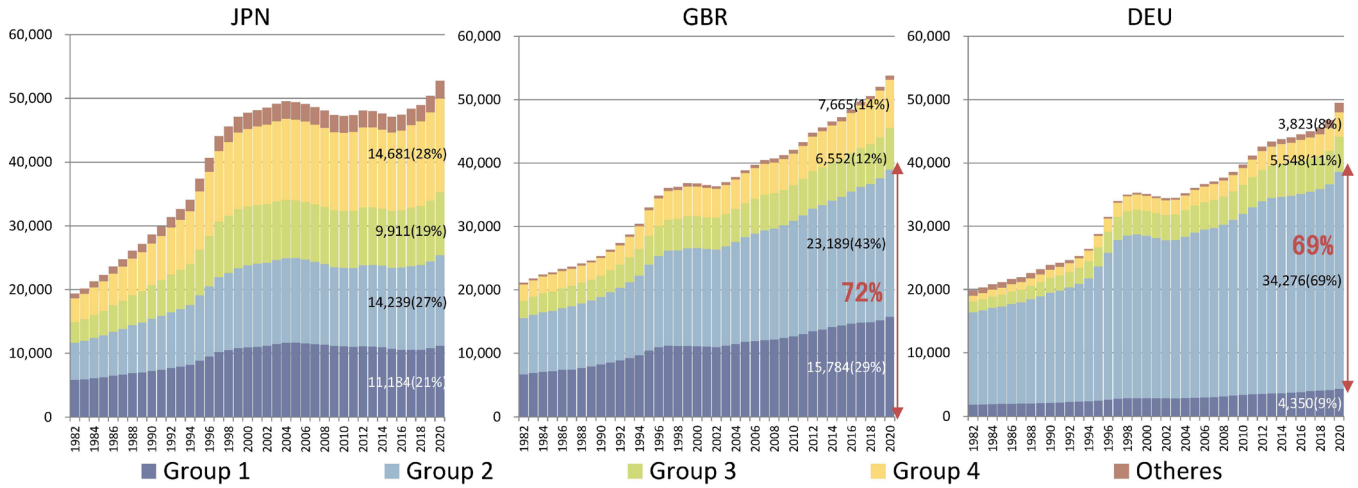
Focusing on scientific papers, NISTEP has been benchmarking scientific research in Japan and major countries and analyzing the scientific paper production structure at the sector/organization level biannually since 2008. In addition, through benchmarking of individual universities in Japan, NISTEP identified each university's strengths and analyzed the status of paper production of the university to the internal organization level.

◆ Laboratory Panel Survey

For the enhancement of the research capacity of Japan, it is necessary to develop datasets that are not merely for understanding specific information about inputs and outputs of research activities. Datasets that allow us to analyze the process of research activities are also required. The Labo Panel Survey (“Survey for research activities in Japanese universities using a database for comprehension of research activities”) targets university faculty members. It aims to construct a laboratory/research group dataset and analyze chronological data on the environment and management of research laboratories/research groups, R&D expenditures, and research outputs. Through this analysis, the survey seeks to elucidate the process of generating outputs from research inputs, derive policy implications for enhancing Japan’s research capabilities, and propose incentive designs.

The trends of the number of papers of universities in Japan, the UK, and Germany by university group

- In Japan, each university group accounts for a similar share.
- Group 2 has the largest share in the UK; together with Group 1, they produce about 70% of papers.
- In Germany, the proportion of Group 2 is substantial, and papers in Group 2 alone account for about 70% of the total.



(Note 1) Articles and reviews were analyzed using the fractional counting method. The figures are three-year moving averages.
The NISTEP compiled the data based on Clarivate Analytics' Web of Science XML (SCIE, end of 2022 version).

Source: NISTEP, "Benchmarking Research Capability of Universities in Japan, the United Kingdom and Germany 2023", Research Material-340, 2024.6 DOI:[https://doi.org/10.15108/rm340]

S&T Foresight and Trend Analysis

S&T foresight activities that analyzes current trends and looks towards the future of society by constantly measuring and analyzing new developments in S&T are indispensable tools for contributing to STI policy making. To envision the future S&T, its products, and society, along with constantly being engaged in foresight activities, NISTEP is also conducting to develop new foresight methods and information gathering and analysis techniques that take advantage of ICT.

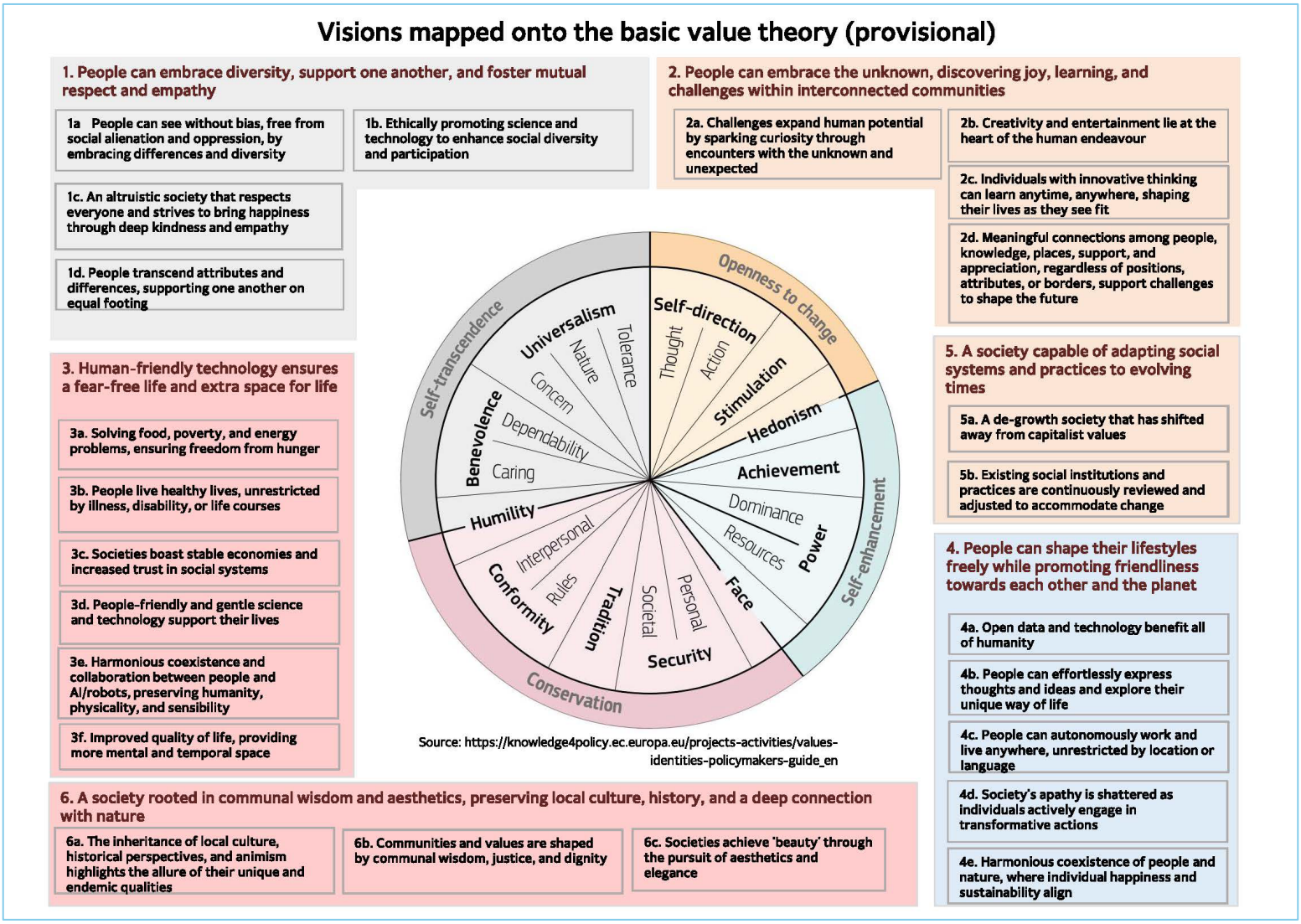
◆Developing and enhancing S&T foresight

Japan has continued to conduct large scale S&T foresight surveys at five-year intervals since 1971 in order to gain insight into S&T and the future that it will bring about. NISTEP has been the organization that is primarily responsible for these surveys since the fifth study in 1992.

NISTEP's S&T foresight is characterized by a long-term horizon of the next 30 years, and by a wide range of discussions with stakeholders from different fields, such as experts from S&T and those from the demand side and from social sciences and humanities. By combining a number of techniques to envision the future of society, NISTEP attempts to identify the S&T that will help realize this future and the social systems and policies that will be needed. We also use case studies to develop new techniques and to perform in-depth analysis.

Furthermore, NISTEP conducts horizon scanning that is a continuous and systematic process to identify emerging trends in new S&T and signs of the resulting social changes. We use quantitative and qualitative approaches to explore and analyze new movements in science and technology and society, and we provide information, in the form of research reports and other materials, on these "signs of change" that allows for some level of uncertainty.

Furthermore, we are taking a global lead in this area by strengthening the international network for foresight activities by taking steps such as participating in international projects and conducting international workshops.



Source: NISTEP, "The 12th Science and Technology Foresight Survey: Co-Creating Value-Driven Visions of Preferred Futures - Synthesis Report", Research Material-, No.331, 2023.9 DOI:[https://doi.org/10.15108/rm331]

◆ Expert network supporting foresight activities

To aid in these foresight activities, NISTEP maintains a diverse network of some 2,000 experts, and leverages this expert network to collect the views of numerous experts through questionnaires. The results of these surveys are used not only in foresight activities, but also in creating fundamental data and materials in support of STI policy, such as designing the areas for research grants.

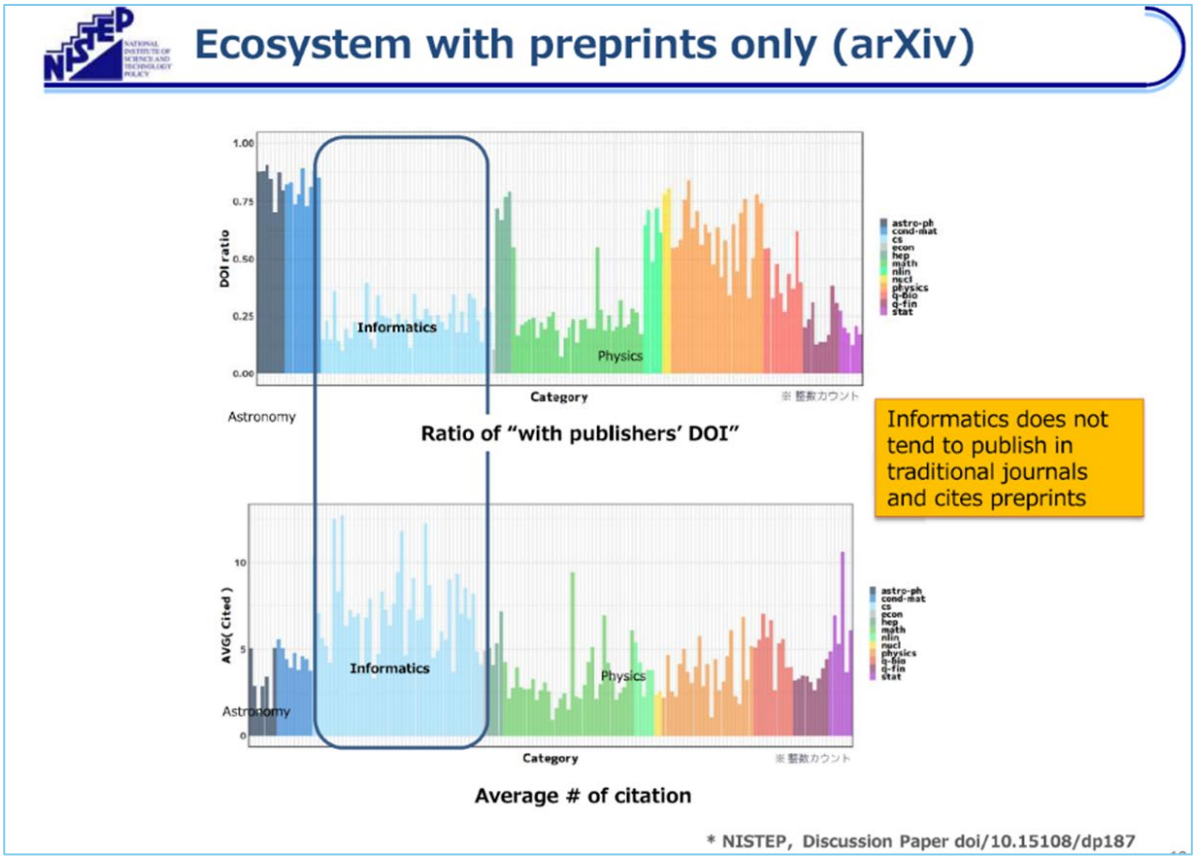
Data-oriented Research on Promoting S&T and Academia

The digital transformation (DX), starting with Japan's Society 5.0 initiative, is bringing about major change in not only the information arena, but also in S&T, academia, and society. Examples of this include the advancement of open data throughout society, open science in the field of scientific research, and EBPM in public administration. It is essential to understand the direction of this change—and in some cases indicate what the future should look like—and then make adjustments to NISTEP's own research to address these developments. Therefore, along with identifying new trends in research—such as open science—and pursuing research that aids in the formulation of policy that address these shifts, NISTEP also works to develop information analytical techniques and systems in the policy area that incorporate artificial intelligence (AI) in collaboration with outside research institutes.

◆Identifying and addressing new trends, including open science

It is widely thought that open science will transform scientific research and influence new relationships between S&T and society, and NISTEP is carrying out research on the topic of sharing research findings and data.

For example, in connection with preprints—manuscripts made available prior to peer review—NISTEP has surveyed researchers in Japan to understand how they use this material and we have also collected and analyzed data from well-known preprint servers to carry out fact-finding on an international level in certain areas.



Source: NISTEP, "Analysis of preprints on arXiv," NISTEP DISCUSSION PAPER, No.187, 2020.8
DOI:[https://doi.org/10.15108/dp187]

◆Developing new analytical techniques and systems incorporating AI

In the context of STI, there are already various sources of open data, and new types of data are starting to be offered. For example, on the input side, data related to competitive funding such as Grants-in-Aid for Scientific Research (Kakenhi), is publicly disclosed. On the output side, new types of data, such as preprints (drafts before official publication) are beginning to make their presence felt. It is necessary to carry out new research to identify trends in the new types of data in the latter category, and it is also necessary to cross-tabulate the various types of published data to carry out unified and multifaceted analysis. In response to the trends in DX and EBPM, in addition to providing conventional analytical results in the form of reports published by policy research institutes, it is also important, for example, to provide “analytical mechanisms” that facilitate the analysis of data from policymakers’ own perspectives. To accomplish this, along with using AI technologies such as natural language processing and machine learning to collect and analyze various types of data in order to research methods for constantly identifying new trends in S&T from a variety of perspectives, we are also developing, on a trial basis, an analysis/visualization platform using ICT so that some of the research results can be provided as a system service.

Science of Science, Technology and Innovation Policy

Based on this background, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) launched the “Science for RE-designing Science, Technology and Innovation Policy (SciREX)” program in FY 2011 to achieve “evidence-based policy formulation” that will create effective policies addressing pertinent issues based on analysis and full understanding of economic and social circumstances from multifaceted perspectives.

NISTEP takes charge of promoting the development of useful data infrastructure for research or analysis in the area of Science, Technology, and Innovation policy formulation.

Source: NISTEP, website https://www.nistep.go.jp/en/?page_id=48

Situation Regarding Science and Technology

The NISTEP expert survey on Japanese S&T and innovation system (NISTEP TEITEN survey) aims to track the status of the system by continuously collecting responses to a fixed questionnaire distributed annually to a fixed group of respondents. The respondents consist of about 2,300 Japanese experts and researchers in universities, public research institutions, and private firms. The survey has several features: it asks the respondents to compare the statuses between the targeted year and the previous one by showing them their answers in the survey previous year; it collects information that are usually difficult to be measured through R&D statistics, including descriptive answers by the respondents; and its questionnaire is linked to the issues mentioned in the Japanese 6th S&T basic plan.

Status of young students aspiring to become researchers

- **The index for Q105 remains relatively low and has declined in many attributes. For Q106 and Q107, the index for Group 1 and 2 universities is relatively high.**
- **The index for those adopted to the doctoral student support program is high overall, but the difference for Q105 is small.**

Young students aspiring to become researchers

	Active researchers								Experts
	Natural science researchers at universities							SSH researchers	Univ. management level
	All	Univ. group				Doct. Stud. Supp. Prog			
		Group 1	Group 2	Group 3	Group 4	Adopted	Others		
Q105: Number of doctoral students with desirable competencies	2.1(-0.3)	2.9(-0.4)	1.9(-0.5)	2.1(0.0)	1.9(-0.2)	2.3(-0.3)	2.0(-0.1)	1.9(-0.6)	3.0(-0.2)
Q106: Environmental improvement for students to enter the doctoral program	4.1(-0.1)	4.8(-0.1)	4.6(0.0)	3.7(-0.1)	3.6(-0.2)	4.5(-0.2)	3.5(-0.1)	3.0(-0.5)	4.6(+0.1)
Q107: Diversifying career paths for PhD holders	3.6(-0.2)	4.3(0.0)	4.2(-0.3)	3.4(-0.1)	2.8(0.0)	4.1(-0.2)	2.9(-0.1)	2.5(-0.3)	4.4(+0.2)

Examples of reasons for increasing the degree of sufficiency	Example of reasons for lowering the degree of sufficiency
• Because financial support for doctoral students (including policy programs such as JST SPRING, as well as the university's own programs) has been enhanced (Q106).	• Fewer Japanese students are entering doctoral programs (Q105) • The fields of doctoral students are unevenly distributed (Q105) • I think that society as a whole needs to raise the value of the doctoral degree. D. degrees need to be more rigorously screened (Q105).

注3: "Adopted" in “Doctoral students support programs" refers to respondents belonging to universities that have been adopted by the Programs to support doctoral students.

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Source: NISTEP, “Analytical Report of Comprehensive Survey on the State of Science and Technology in Japan (NISTEP TEITEN Survey 2023),” NISTEP REPORT, No. 201, 2024.5
DOI:[https://doi.org/10.15108/nr201]

Information on research results

NISTEP also provides the following information to the public.

◆ STI Horizon https://www.nistep.go.jp/stih/

NISTEP's STI Horizon journal(Japanese only), published quarterly, delivers information that contributes to STI policy. The published interviews introduce readers to highly insightful expert views (special interviews) . The Horizon and Report sections of the journal present a broad range of forward-looking research.

◆ Review Seminar

Every year, NISTEP presents its research outputs to the public, including universities, enterprises, and government agencies. The goal of the review seminar is to interest more people in NISTEP's research activities.

◆ NISTEP Selection (Nice Step Researchers)

Since 2005, NISTEP has been selecting researchers who made outstanding contributions to S&T as the "NISTEP Selection" (Nice Step Researchers).

◆ Collaboration and cooperation with other institutes

NISTEP signed agreements with policy research institutes and universities in Japan and overseas to conduct joint research and personnel exchanges, and to invite leading researchers for symposia.

In addition, NISTEP promotes international collaboration by participating in Trilateral Science and Technology Policy Seminar that government-affiliated think tanks in Japan, China and South Korea present and discuss their research activities.

Collaboration partners:
National Graduate Institute for Policy Studies (GRIPS) , Japan Science and Technology Agency (JST) and Riken , Overseas policy research institutes (USA, EU, Germany, UK, France, China, South Korea, Finland, Egypt and Turkey).

WEB Site
https://www.nistep.go.jp/en/

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FaceBook

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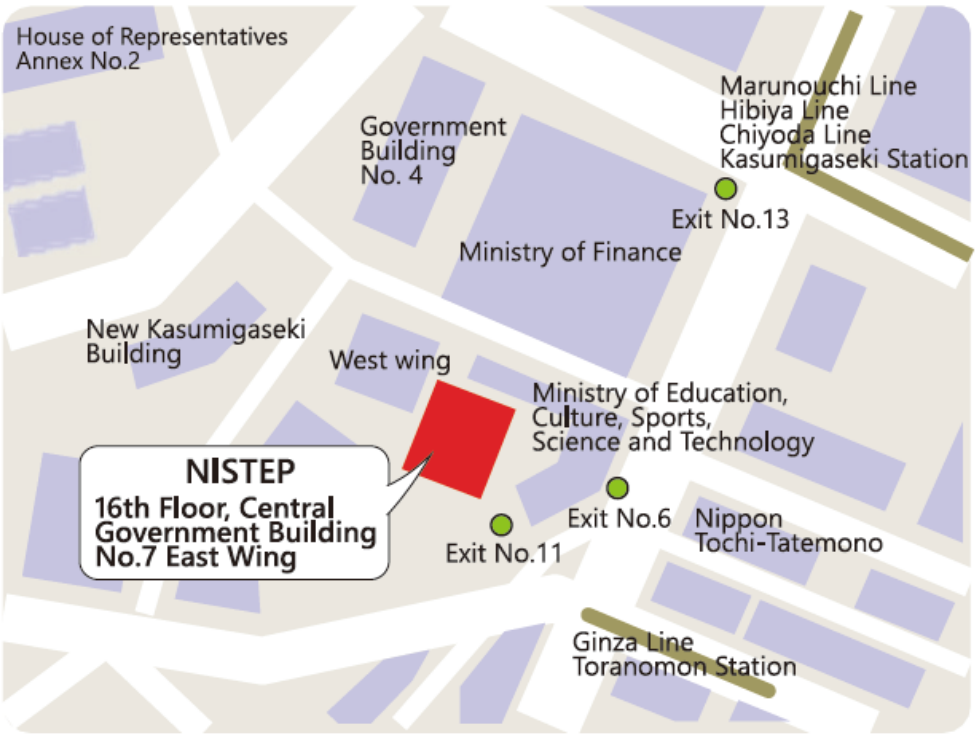

Tokyo Metro Ginza Line:
Toranomon Station, Exit No.6,11 (2-minute walk)
Tokyo Metro Chiyoda Line/Hibiya Line/Marunouchi Line:
Kasumigaseki Station, Exit A13 (5-minute walk)

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