Current Status and Trends of Research Data Management-Initiatives in Japanese University Libraries

Yasuyuki Minamiyama, Ui Ikeuchi, Kazuhiro Hayashi

Abstract

Dieser Artikel präsentiert die Landschaft des Forschungsdatenmanagements (FDM) an japanischen Universitäten, basierend auf nationalen Umfragen von 2020 bis 2024. Die japanische FDM-Entwicklung wird hauptsächlich durch politische Vorgaben vorangetrieben, was bis 2024 zu einem signifikanten Wachstum bei institutionellen Repositorien, Datenspeicherung und der Unterstützung bei der Erstellung von Datenmanagementplänen (DMP) geführt hat. Personalmangel behindert jedoch die weitere Serviceentwicklung. Um diese Engpässe zu bewältigen, hat die japanische Bibliotheksgemeinschaft drei strategische Initiativen gestartet: die Sammlung von Fallstudien, die Erstellung lokalisierter FDM-Lernmaterialien und die Veröffentlichung von Registrierungsrichtlinien. Diese Maßnahmen zielen darauf ab, Serviceeffizienz zu steigern, Mitarbeiterkompetenzen aufzubauen und die obligatorische Registrierung von Forschungsdaten zu erleichtern.

This article introduces the Research Data Management (RDM) landscape in Japanese universities based on national surveys from 2020 to 2024. Japanese RDM development is primarily policy-driven, leading to significant growth in institutional repository provision, data storage, and Data Management Plan (DMP) creation support by 2024. However, the lack of dedicated manpower for RDM services is hindering further service development. To address these operational bottlenecks, the Japanese librarian community has launched three strategic initiatives: compiling case studies, creating localized RDM learning materials, and publishing research data registration guidelines. These efforts aim to enhance service efficiency, build staff capacity, and facilitate mandatory research data registration.

Introduction

In recent years, the importance of Research Data Management (RDM) has been widely recognized in the context of research integrity and the reuse of research results. RDM covers the entire lifecycle of the data, such as storage, access and preservation of data created or collected during research[1]. The efficient implementation of RDM is an important challenge for researchers, and in fields such as life sciences[2], earth science[3], and social sciences[4], domain-specific RDM support services have been developed. Furthermore, in response to the trend of Open Science, many policy expectations and requests have been made. A representative example is the "Recommendation on Open Science"[5] published by UNESCO in October 2021, which mentions research data as one of the open scientific knowledge. This recommendation also refers to the FAIR Principles (Findable, Accessible, Interoperable, Reusable)[6,7] for the development of research data based on excellent data governance and stewardship. In a nutshell, RDM is beginning to take on social significance in response to expectations for sharing and reusing research data across disciplines.

In the light of the open science movement, this article addresses the current status of RDM services provided by universities and research institutions in Japan. First, we provide an overview of policy trends in Japan related to RDM. Next, we introduce the status of initiatives by Japanese universities and research institutions as of December 2024 based on the "Survey of Research Data Management Initiatives in Japanese Institutions." We note that this article is based on the presentation "Current Status and Trends of Research Data Management Initiatives in Japanese University Libraries" given at the session "Themenkreis 3: Perspektivwechsel – Bibliotheken, Kooperationen und Partnerschaften Borgward Saal : Landesinitiativen Open Access (Wednesday, June 25, 14:00 – 15:30)" of the "9. Bibliothekskongress 2025 (24.-27. Juni 2025, Bremen)."[8]

1 CODATA: "Research data management". URL: https://terms.codata.org/rdmt/research-data-management [6. November 2025].

2 Venkatesan, A./Karamanis, N./Ide-Smith, M./Hickford, J./McEntyre, J.: Understanding life sciences data curation practices via user research, in: F1000Research 8 (2019) S. 1622. DOI:10.12688/f1000research.19427.1.

3 Gray, J./Szalay, A.S./Thakar, A.R./Stoughton, C./vandenBerg, J.: Online scientific data curation, publication, and archiving. In: Szalay, Alex S. (Hrsg.): SPIE Proceedings. SPIE 2002. DOI:10.1117/12.461524.

4 Johnson, W.G.: The ICPSR and Social Science Research, in: Behavioral & Social Sciences Librarian 27 (2008) S. 140-157. DOI:10.1080/01639260802385200.

5 UNESCO: "UNESCO Recommendation on Open Science". URL: https://doi.org/10.54677/MNMH8546.

6 Wilkinson, M. et al.: The FAIR Guiding Principles for scientific data management and stewardship, in: Scientific Data 3 (2016) Nr. 160018. DOI:10.1038/sdata.2016.18.

7 FORCE11: "THE FAIR DATA PRINCIPLES". URL: https://www.force11.org/group/fairgroup/fairprinciples [6. November 2025].

8 Minamiyama, Y.: Current Status and Trends of Research Data Management Initiatives in Japanese University Libraries. URL: https://bid2025.abstractserver.com/program/#/details/presentations/468 [6. November 2025].

Policy Trends in Japan

In Japan, RDM-related policies have generally been implemented in connection with Open Science policies. Since the joint statement on the opening up of research data at the G8 Science Ministers' Meeting in 2013[9], the issuance of policies and recommendations has become active. In particular, the "Management and Utilization of Research Data based on Open and Closed Strategy" has been incorporated into the 6th Science, Technology and Innovation Basic Plan in 2021[10]. For implementing the 6th Basic Plan, the "Basic Concept on the Management and Utilization of Research Data Obtained with Public Funds" was published in April 2021[11]. This concept document outlines the construction of a data platform centered on the research data infrastructure system (NII Research Data Cloud, NII RDC). It also outlines that institutions conducting research and development are required to formulate a data policy and proceed with the collection of research data in their institutional repositories and the addition of metadata. It should be noted that RDM was explicitly stated as an important issue for universities and research institutions, not just the research community.

Subsequently, the "Developing a Research Data Ecosystem for the Promotion of Data-Driven Science" project was initiated under the leadership of the Cabinet Office in 2022[12]. This project is jointly promoted by the National Institute of Informatics (NII), which is in charge of developing the NII RDC, and four institutions—RIKEN, the University of Tokyo, Nagoya University, and Osaka University—which are appointed to develop the environment for utilizing the infrastructure. Furthermore, the "National Policy on Promoting Open Access to Publicly Funded Scholarly Publications and Scientific Data"[13] published in 2024, it is mandated to immediately register papers and underlying data to institutional repositories. As a project to realize this national policy, a large-scale subsidy project by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the "Open Access Acceleration Project," has been implemented since June 2024[14].

Current Status and Trends of Research Data Management Initiatives

In response to the policy trends described above, Japanese universities and research institutions have begun attempts to formulate data policies and develop RDM services. This section introduces the status of initiatives by Japanese universities and research institutions as of December 2024.

What is the "Survey of Research Data Management Initiatives in Japanese Institutions ?"

The "Survey of Research Data Management Initiatives in Japanese Institutions" is an online questionnaire survey jointly conducted by the Japan Consortium for Open Access Repository (JPCOAR), the Academic eXchange for Information Environment and Strategy (AXIES), and the National Institute of Science and Technology Policy (NISTEP). This survey has been conducted biennially since 2020 as the most large-scale survey in Japan. This survey started as part of the RDM Case Study Formation Project[15], in which a total of 18 institutions participated including national universities, private universities, and research and development corporations. In the 2020 and 2022 surveys, there were responses from 300 to 350 institutions. From the past two surveys, we observed the following trends:

1) The RDM-related activities implementation/consideration rate is higher for inter-university research institutes and National Research and Development Agencies than for universities,

2) The RDM-related activities implementation/consideration rate for universities is highest in the order of national universities, private universities, and public universities, and is also higher for universities with a larger number of faculties,

3) Differences are seen in the perception of barriers to data publishing and necessary skills depending on the status of RDM system establishment and the presence/

9 G8 Science Ministers: "G8 Science Ministers Statement". URL: https://www.gov.uk/government/news/g8-science-ministers-statement [6. November 2025].

10 Cabinet Office: "The 6th Science, Technology and Innovation Basic Plan". URL: https://www8.cao.go.jp/cstp/kihonkeikaku/index6.html [6. November 2025].

11 Cabinet Office, Secretariat for Science, Technology and Innovation Policy. "Basic Concept on the Management and Utilization of Research Data Obtained with Public Funds". https://www8.cao.go.jp/cstp/datapolicy_outline.pdf, (Accessed 2025-11-06).

12 National Institute of Informatics: "Developing a Research Data Ecosystem for the Promotion of Data-Driven Science". URL: https://www.nii.ac.jp/creded/nii_ac_jp_creded.html [6. November 2025].

13 Integrated Innovation Strategy Promotion Council: "National Policy on Promoting Open Access to Publicly Funded Scholarly Publications and Scientific Data". URL: https://www8.cao.go.jp/cstp/oa_240216_en.pdf [6. November 2025].

14 Ministry of Education, Culture, Sports, Science and Technology: "Start of Call for Applications for the Open Access Acceleration Project". URL: https://www.mext.go.jp/b_menu/boshu/detail/1421775_00008.htm [6. November 2025].

15 Minamiyama, Y. et al.: Final Report of the RDM Case Study Formation Project, FY2019-2021. 2021. DOI:10.34477/0002000160.

absence of experience in providing RDM services[16,17]. In the subsequent 2024 survey, we observed significant changes in the formulation of data policies, budgets, and the implementation status of RDM support services. Here, we report the analysis results focused on the implementation status of RDM support services.

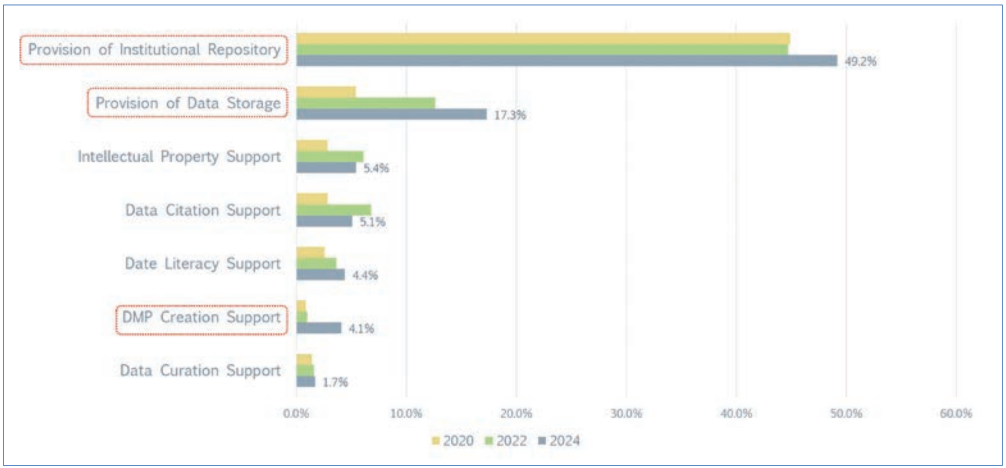

Figure 1 National Implementation Status of RDM Support Services (Overall, Secular Change)

Implementation Status of RDM Support Services

This survey asked about the implementation status of RDM support services, categorizing them into the following seven categories: Data Management Plan (DMP) creation support, Data literacy support, Intellectual property support, Provision of data storage, Provision of Institutional Repository, Data curation support, and Data citation support. Each category was set as a single-choice format for the implementation status of RDM support services. Figure 1 shows the secular change in national implementation status.

Although the priority of RDM support service provision has not changed much, the growth rates in the categories of "Provision of Institutional Repository," "Provision of Data Storage," and "DMP Creation Support" are particularly high. Below, we introduce these categories in order.

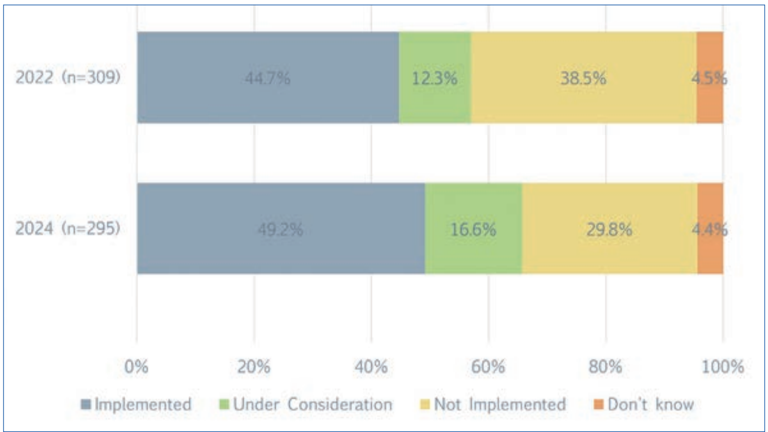

Figure 2 National Implementation Status of "Provision of Institutional Repository" (Overall, Secular change)

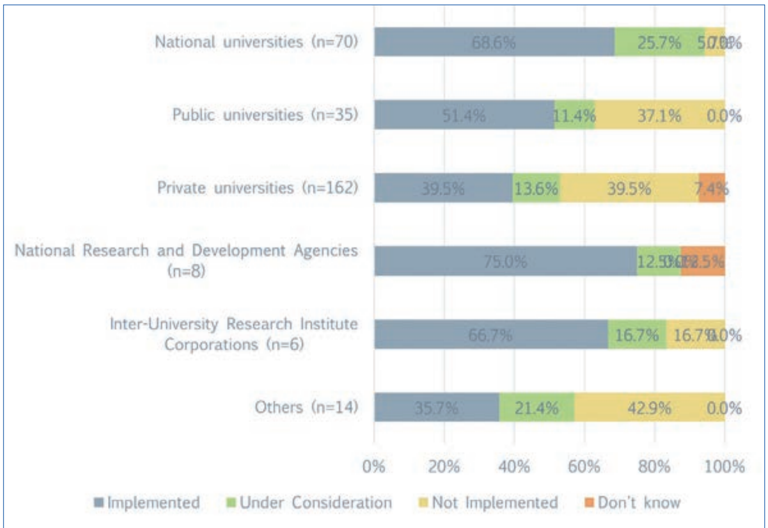

Figure 3 National Implementation Status of Provision of Institutional Repository (by institution type, 2024)

Implementation Status of "Provision of Institutional Repository"

First, we explain the aggregation results of "Provision of Institutional Repository." Figure 2 and Figure 3 show a comparison of the service provision status in 2022 and 2024.

As of December 2024, about half of Japanese universities and research institutions have their own institutional repositories. In particular, many small and medium-sized public and private universities are major stakeholders. Two factors led to many small and medium-sized public and private universities establishing institutional repositories; first, Japan's degree regulations were revised in 2013, mandating that doctorate recipients publish their dissertations online within one year of receiving their degree. This marked Japan's first open access mandate, compelling smaller universities to comply[18]. The second factor is the provision of JAIRO Cloud, a national repository hosting service operated by NII. JAIRO Cloud began service in

16 Ikeuchi, U./Hayashi, K.: Status of Research Data Management (RDM) Practice in Japanese Research Institutions: Challenges and Prospects toward the Realization of Open Science, in: STI Horizon 8 (2022) Nr. 1, S. 50-55. DOI:10.15108/stih.00287.

17 Ikeuchi, U./Minamiyama, Y./Hayashi, K.: Status of Research Data Management (RDM) Practice in Japanese Research Institutions 2022: Secular Changes and Challenges, in: STI Horizon 10 (2024) Nr. 3, S. 30-36. DOI:10.15108/stih.00383.

18 Shuto, M.: Looking back on Degree Regulations revision of OA for ETDs, in: Journal of College and University Libraries 103 (2016) S. 24-33. DOI:10.20722/jcul.1427.

2012, preceding the open access requirement for dissertations. It primarily serves small and medium-sized universities and research institutions lacking institutional repositories, and its usage has increased year by year[19].

Having said that, there are challenges in actual operation. Figure 4 shows the challenges and possible barriers for sharing research data through institutional repositories.

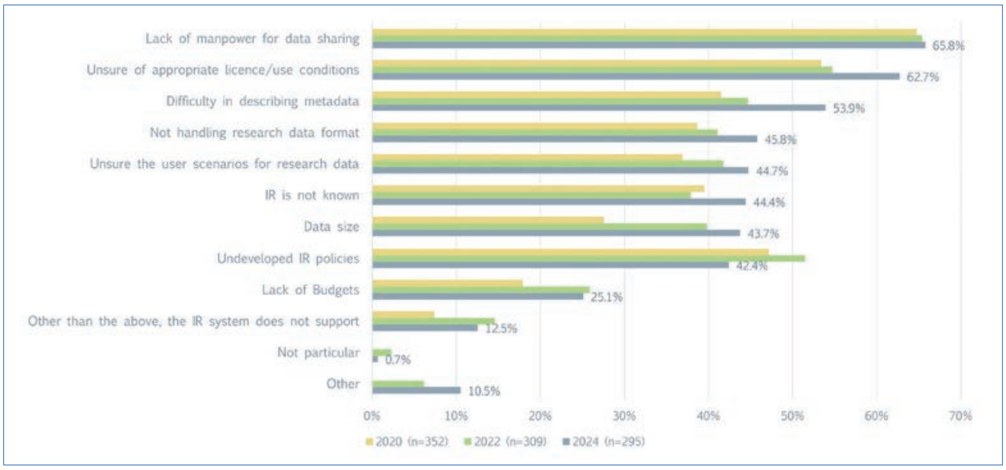

Figure 4 Challenges and possible barriers for sharing research data through institutional repositories

Against the backdrop of mandatory requirements under Japanese national policy, most issues—led by a "Lack of manpower for data sharing"—have continued to rise. Only IR policy issues and budgeting issues have decreased over the years; however, this is highly likely due to the impact of the "Open Access Acceleration Project" implemented by MEXT in 2024. As this project is only for one year, it is not appropriate to discuss some trends based on this 2024 data for decreasing these two issues.

Implementation Status of "Provision of Data Storage"

Next, we explain the aggregation results of "Provision of Data Storage." Figures 5 and 6 show the secular change in this category.

Provision of data storage has increased about 5 percentage points since 2022, with the number of organizations considering it more than doubling National Research and Development Agencies and national universities are pushing up the average. Multiple factors are possible for this reason; one possible reason is that GakuNin RDM, an institutional storage brokering service, has gained popularity and the institutional data storage service has become more visible. GakuNin RDM enables researchers to manage and share data within a closed environment and is available free of charge as a national service[20]. Relatedly, in a question that asked in detail about the management status of information infrastructure, 23.4 percent of institutions responded that they were "implementing data linkage between information infrastructures through authentication," suggesting that the development of authentication-related systems is progressing in conjunction with the introduction of storage services.

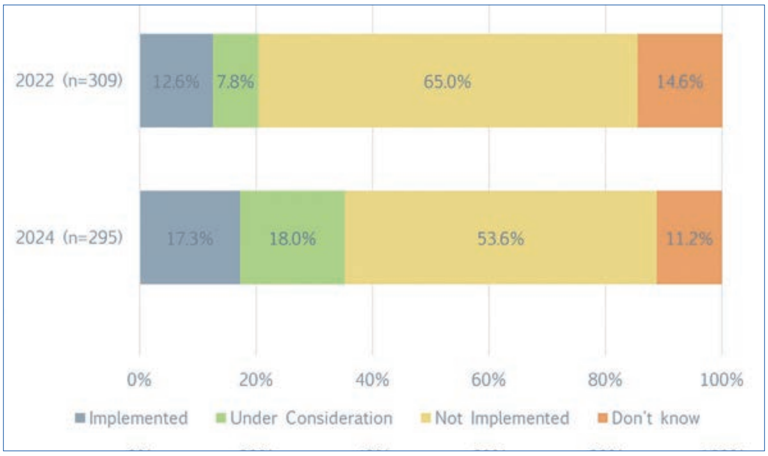

Figure 5 National Implementation Status of "Provision of Data Storage" (Overall, Secular change)

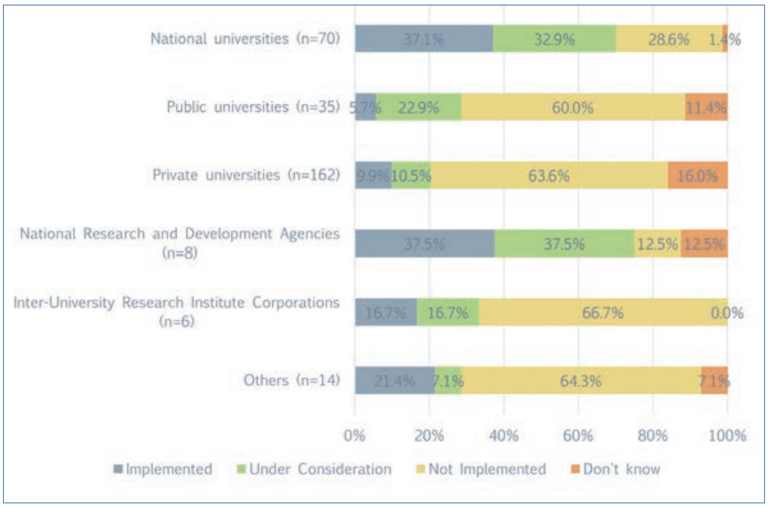

Figure 6 National Implementation Status of "Provision of Data Storage" (by institution type, 2024)

19 Hayashi, M., et al.: Development of National-level Institutional Repository Cloud Service for Open Science. In: The 16th International Conference on Open Repositories (OR2021). Zenodo. URL: https://doi.org/10.5281/zenodo.5442279 [6. November 2025].

20 Komiyama, Y./Yamaji, K.: Interdisciplinary research data management service for the whole universities and research institutions in Japan that emphasizes research integrity. In: Digital Infrastructures for Research 2018. URL: https://indico.egi.eu/event/3973/contributions/9198/contribution.pdf [6. November 2025].

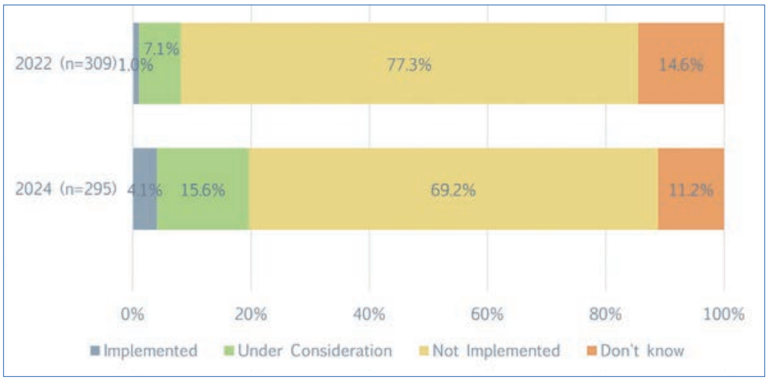

Figure 7 National Implementation Status of "DMP creation support" (Overall, Secular change)

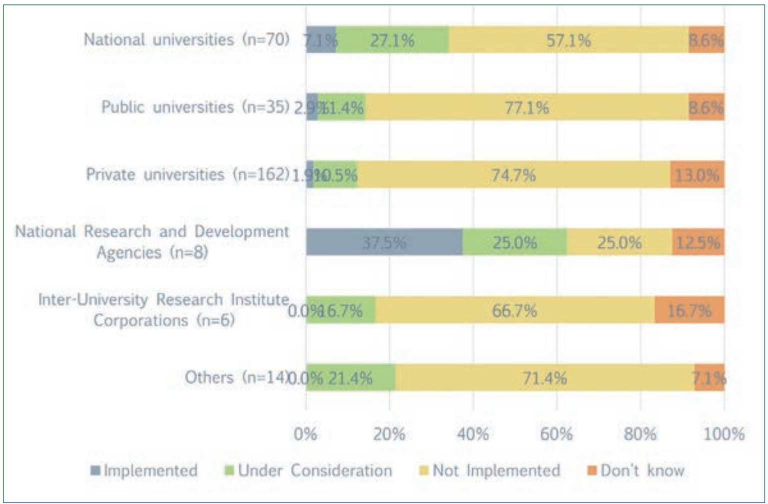

Figure 8 National Implementation Status of "DMP creation support" (by institution type, 2024)

Status of DMP Creation Support Service Provision

Lastly, we explain the aggregation results of "DMP creation support." Figure 7 and Figure 8 show a comparison of the DMP creation support service provision status in 2022 and 2024.

The DMP creation support is still in its infancy compared to the provision of institutional repositories, but has seen a fourfold increase in provision between 2022 and 2024. National research and development agencies and national universities are pushing up the average, and the main reason can be seen that Japanese funding agencies adopt the creation of DMP mandatory from 2025; most of universities will now need to seriously consider DMP support. As can be seen from this case, progress in building an RDM support structure in Japan is strongly dependent on policy directions. For a more detailed analysis, please refer to our 2024 research report[21].

RDM Initiatives by JPCOAR

This section introduces the activities that JPCOAR has implemented based on these survey results. JPCOAR is a consortium primarily organized by university librarians in Japan. Since the survey was conducted in 2020, JPCOAR identified some common practical issues and exploring solutions. This article introduces three representative initiatives implemented by the JPCOAR.

Compiling RDM case studies in Japan

From the 2020 survey results, we realized that many universities and institutions cannot understand how to implement organizational RDM services. To address this issue, JPCOAR and AXIES undertook an initiative to compile a collection of case studies of precedents in Japan. The collection includes a total of 18 cases, which are characteristic initiatives by the leading institutions. Table 1 shows the list of institutions.

The cases are summarized by category: 1) Research Data Management Support, 2) Research Data Publication/Utilization, 3) User Support, and 4) Establishment of Management System. They also briefly describe the background leading to the initiative, the implementation system, and the discussion process. In addition, reference materials are organized by category, summarizing information that should be consulted when tackling similar cases at one's own institution. This collection of case studies was published on the JPCOAR website in September 2022[22].

Creation of RDM Learning Materials

Next, we introduce the overview for developing Japanese RDM learning materials. In Japan, the need for localized RDM learning materials has been recognized since around 2014. JPCOAR prioritized the development of learning materials as part of its RDM service launch and began analyzing overseas RDM materials in 2015. JPCOAR developed and published the "RDM Training Tool" as its first Japanese RDM educational resource in 2017. Subsequently, "Design and Practice of Research Data Management Services" for RDM supporters was published in 2018, and "Research Data Management for Researchers" for researchers in 2020. These resources are critical for efficiently scaling RDM expertise. By providing high-quality, standardized materials, institutions facing manpower constraints can drastically reduce the time and resources required for localized training and skill development. Table 2 shows the list of RDM learning materials developed by JPCOAR.

21 Ikeuchi, U./Minamiyama, Y./Hayashi, K.: Status of Research Data Management (RDM) Practice in Japanese Research Institutions 2024: Policy Effects and Persistent Challenges, in: STI Horizon 11 (2025) Nr. 3, S. 35-41. DOI:10.15108/stih.00414.

22 AXIES Research Data Management subcommittee and JPCOAR Research Data Working Group: "Research Data Management Case Studies." 2022. DOI:10.34477/0002000217.

These learning materials are provided in editable Microsoft PowerPoint format, and video materials are also offered on GakuNin LMS (https://lms.nii.ac.jp/) as part of NII's educational training program. Following the continued high demand for RDM learning materials in the survey results since 2020, JPCOAR has been revising these learning materials and is also working with other organizations (e.g., AXIES, Osaka University) to develop learning materials by job type and research field[23].

Guidelines for Registering Research Data in the Institutional Repository

Lastly, we introduce the recent activities for creating "Guidelines for Registering Research Data in the Institutional Repository" based on the 2024 survey results. As mentioned earlier, the DMP creation will become mandatory in Japan from 2025 onwards and, in relation to this, the registration of data in institutional repositories will also become mandatory. However, the utilization of institutional repositories has been promoted with different motivations by each university and research institution, and there is a significant discrepancy between policy requirements[24]. In particular, standard registration rules have not been established for the underlying data of academic journal papers[25], and there are no practical documents that can be referenced domestically.

Therefore, we created "Guidelines for Registering Research Data in the Institutional Repository."[26] These guidelines organize the procedure for registering research data in institutional repositories as a series of flows and summarize the points to be noted at each step, referring to domestic institutional examples. The primary purpose of these guidelines is to establish standardized, step-by-step procedures. This standardization is crucial for ensuring service quality and operational efficiency, especially for institutions struggling with limited staff and expertise. By minimizing the need for local trial-and-error, these guidelines act as a critical tool for operationalizing the mandatory registration with reduced manpower. Institutional repository staff at each university and research institution can refer to the points covered in these guidelines to understand the overall picture of the workflow for research data registration

Category	Title (Translated from Japanese)	Institution
Research Data Management Support	Development and Operation of Data Publication Repository	National Institute for Environmental Studies
	Campus-wide Sharing of Research Data and Experimental Equipment	Gifu University
	Collaboration on Core Services for Utilizing Research Outcomes	RIKEN
	Establishment of a University-Wide Research Data Storage Environment	Kanazawa University
Data Publication/ Utilization	Providing an Environment to Support Data Publication and Utilization by Research Organization	RIKEN
	Analysis of Research Data Publication Patterns via Institutional Repositories Hokkaido University	Hokkaido University
	Efforts Toward External Search Engine Optimization	Hokkaido University
	Survey of Campus Database Locations to Promote and Support Data Utilization	Nagoya University
	Rebuilding Discontinued Campus Databases	The Graduate University for Advanced Studies, SOKENDAI
User Support	Research Data Workshop	National Institute for Environmental Studies
	Launch of Open Science and Open Access Support Site	Nagoya University
	Consulting for Metadata Creation and Data Knowledge Development	RIKEN
Establishment of Management System	Granting CC Licenses to Institutional Repository Content Including Supplementary Data	Japan Atomic Energy Agency
	Establishing Procedures for Archiving Research Data Linked to Papers	Okinawa Institute of Science and Technology Graduate University (OIST)
	Formulation of the Data Policy and Establishment of Internal Regulations	Japan Atomic Energy Agency/ Tokyo Institute of Technology/ Kyoto University
	Establishment of a University-wide Research Data Management Support Department	Kyushu University

Table 1 List of leading institutions for implementing organizational RDM services.

23 JPCOAR: "Learning Repository Operations" (in Japanese). URL: https://jpcoar.org/support/repository-abc/#a4 [6. November 2025].

24 Tanabe, K. et al.: A survey on publishing article and evidence datasets on institutional repositories (in Japanese), in: Joho Chishiki Gakkaishi 34 (2024) Nr. 2, S. 127-134. DOI:10.2964/jsik_2024_008.

25 Mikami, A./Minamiyama, Y.: Developing a Measurement Method for Counting the Published Research Data Underlying Research Paper (in Japanese), in: Joho Chishiki Gakkaishi 33 (2023) Nr. 2, S. 242-247. DOI:10.2964/jsik_2023_023.

26 Kobayashi, Y. et al.: Guidelines for Registering Research Data in the Institutional Repository (in Japanese). 2025. DOI:10.34477/0002000667.

	Research Data Management for Researchers	Plan and Practice of Research Data Management	RDM Training Tool
Target	Researchers	RDM supporters in academic institutions	People interested in RDM
Skills	Curated RDM Basics + α	RDM Basics + Designing RDM Services	RDM Basics
Contents	All 12 chapters (approx. 96 minutes)	All 6 chapters (approx. 225 points)	Total 4 weeks (approx. 124 minutes)
Requirements	Test (Course Completion Assessment) 70 points or higher	Test total score of 70 points or higher	Score rate of 70% or higher
Certification	Yes	Yes	No
Course Prerequisites	No	No	No

Table 2 List of RDM learning materials developed by JPCOAR

at the procedural level. Furthermore, when creating or revising specific operational manuals, it is possible to customize and use these guidelines according to the circumstances of their own institution. These guidelines were based on research results regarding analyzing data curation activities across fields[27]; they reconstructed various data curation activities into institutional repository operations in Japan.

Conclusion

In this article, we showed the growing international recognition of RDM and trends in open science policy in Japan. Next, we introduced RDM current status and trends in Japanese institutions based on a survey conducted every other year since 2020. Furthermore, we introduced JPCOAR initiatives based on the survey.

Finally, we will share our personal views on future prospects. As background to the initiatives introduced above, Japan faces a more fundamental challenge: the lack of established professional roles such as data librarians or data curators. Since Japanese librarians are only offered a generalist career path, those responsible for institutional repositories continue to explore their way through RDM-related tasks. At the same time, Japanese researchers often express a desire for RDM knowledge tailored to the conventions of their specific field. As an initiative in response to such voices, initiatives such as the development of the cross-disciplinary RDM information site RDMkit-jp (https://rdmkit.rcos.nii.ac.jp/) are also underway. Going forward, we will need to make efforts to compare RDM practices across research fields and accumulate this information in a highly versatile format. We hope our initiatives are of some help to German colleagues.

Prof. Dr. Yasuyuki Minamiyama
Center for Social Research and Data archives
Institute of Social Science, The University of Tokyo, Japan
minamiyama@iss.u-tokyo.ac.jp
ORCID ID: 0000-0002-7280-3342

Prof. Dr. Ui Ikeuchi
Faculty of Language and Literature, Bunkyo University
ORCID ID: 0000-0002-5680-1881

Prof. Kazuhiro Hayashi
Principle Senior Fellow/Research Unit for Data Application, National Institute of Science and Technology Policy
ORCID ID: 0000-0003-1996-4259

Acknowledgments
We would like to thank Dr. Cosima Wagner (Freie Universität Berlin) for supporting our presentation at BiblioCon.

27 Minamiyama, Y.: A study on formalizing the knowledge of data curation activities across different fields, in: PLOS ONE 19 (2024) Nr. 4, S. e0301772. DOI:10.1371/journal.pone.0301772.