

明日のための研究データの保存： GakuNin RDMのアプローチ

Preserving Research Data for Tomorrow: The GakuNin RDM Approach

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国際シンポジウム「研究データの持続可能なライフサイクル構築へ向けて」
FY 2024 Kyoto University Library Network Lecture & International Symposium:
Toward a Sustainable Research Data Lifecycle

16th January, 2025 13:30-17:50

Self-introduction

- 込山 悠介 / Yusuke Komiyama, 国立情報学研究所 / National Institute of Informatics (NII)
- コンテンツ科学研究系 & オープンサイエンス基盤研究センター 副センター長・准教授
- Associate Professor, The Digital Content and Media Sciences Research Division & Deputy Head, Research Center for Open Science and Data Platform.
- 国立情報学研究所コンテンツ科学研究系准教授。博士（農学）。
2014年3月、東京大学大学院農学生命科学研究科博士課程を修了、在学中は日本学術振興会特別研究員 (DC2) でバイオインフォマティクス研究に従事。
2014年4月、東京大学医科学研究所ヒトゲノム解析センター特任研究員でスパコン運用に従事。
2016年4月より国立情報学研究所コンテンツ科学研究系・助教。
2017年4月より国立情報学研究所オープンサイエンス基盤研究センターの発足に伴い、研究データ管理基盤 GakuNin RDMの研究開発、運営および国際連携に従事。
2021年4月より現職、2021年10月よりオープンサイエンス基盤研究センター副センター長。
2024年4月より非常勤の文部科学省 研究振興局 参事官（情報担当）付 学術調査官。
- Yusuke Komiyama is an Associate Professor at the National Institute of Informatics (NII) in the Digital Content and Media Sciences Research Division. He received his Ph.D. in bioinformatics from the University of Tokyo (UT) in 2014 and worked as a postdoctoral researcher managing supercomputers at the Human Genome Center, Institute of Medical Science, UT. He joined NII as an Assistant Professor in 2016 and has been involved in the GakuNin RDM project since 2017. Promoted to Associate Professor in 2021, he is also Deputy Head of the Research Center for Open Science and Data Platform, NII. Since April 2024, he serves as (part-time) Senior Scientific Research Specialist at the Ministry of Education, Culture, Sports, Science and Technology.



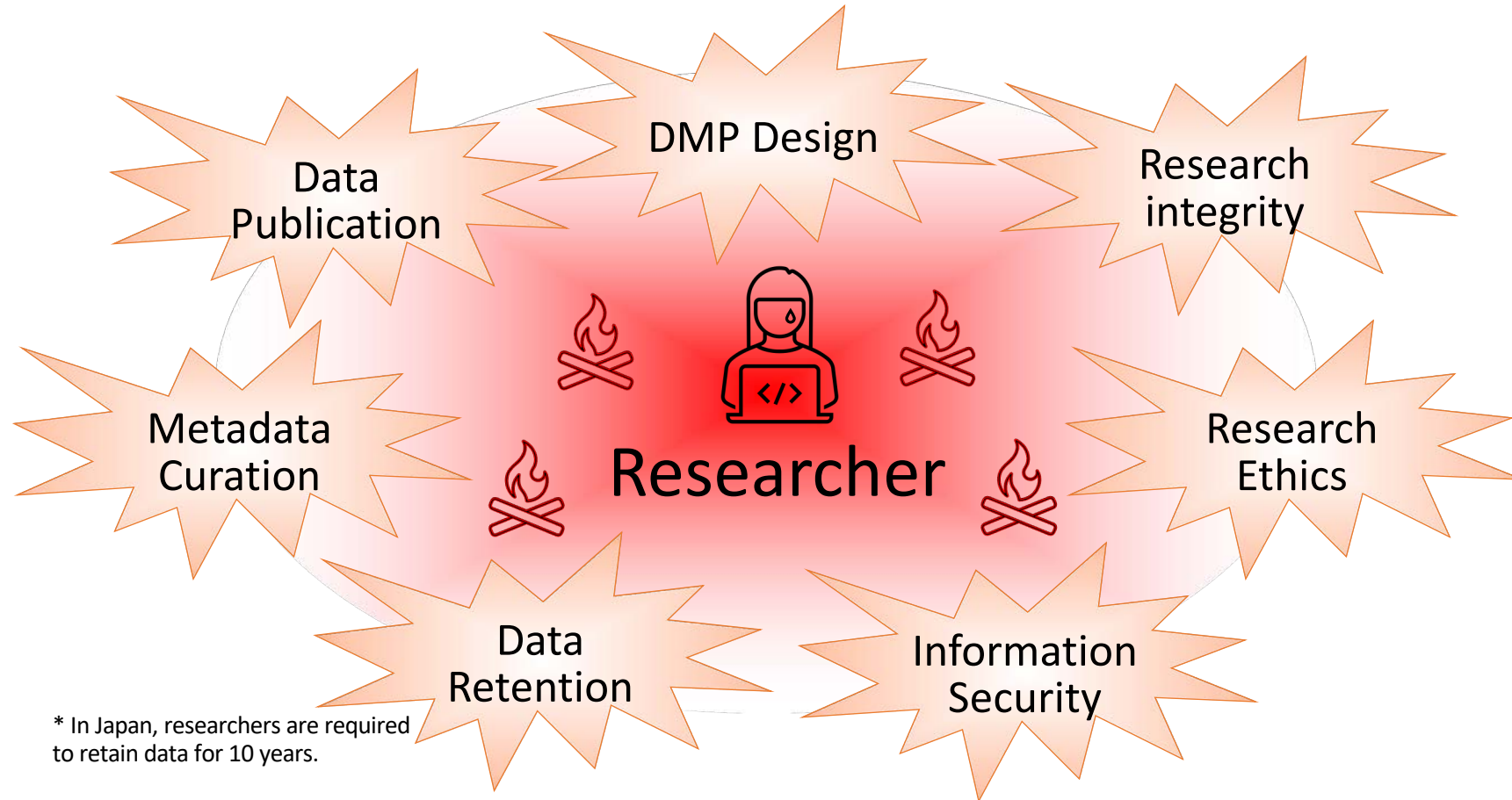
NII Research Data Cloud Vision and Current Status

Background of NII Research Data Cloud

Policy Developments on Open Science in Japan

March 2015	Cabinet Office, "Promoting Open Science in Japan" ⇒ Follow-up discussions have been take place since 2015
January 2016	"The 5th Science and Technology Basic Plan" (In Japanese) ⇒ Open Science has been promoted in order to reinforce the intellectual infrastructure
July 2016	Science Council of Japan (SCJ), "Recommendations Concerning an Approach to Open Science that Will Contributes to Open Innovation"
June 2017	Cabinet Office, "Comprehensive Strategy for Scientific and Technological Innovation 2017" (In Japanese)
June 2018	Cabinet Office, "Integrated Innovation Strategy" (In Japanese)
June 2018	Cabinet Office, "Guideline for Establishing Data Policy at National Research and Development Agencies" (In Japanese)
March 2019	Cabinet Office, "Guidelines for the Development and Operation of Research Data Repositories" (In Japanese)
June 2019	Cabinet Office, "Integrated Innovation Strategy" (In Japanese)
December 2019	Cabinet Office, "Report on the Strategy for Research Data Infrastructure Development and International Expansion" (In Japanese)
November 2019	Science Council of Japan (SCJ), "Proposal for the Development of a Sustainable Data Infrastructure for Life Sciences" (In Japanese)
May 2020	Science Council of Japan (SCJ), "Proposal for Toward Deepening and Promoting Open Science" (In Japanese)
May 2021	Cabinet Office, "6th Basic Plan for Science, Technology and Innovation" (In Japanese)
April 2021	Council for Integrated Innovation Strategy, "Fundamentals of the Management and Use of Research Data using Public Funds" (In Japanese)
December 2022	Science Council of Japan (SCJ), "Responses to deliberations on the promotion of research DX - especially from the perspective of promoting open science and data utilization -" (In Japanese)

Increasing workload for researchers towards research digital transformation

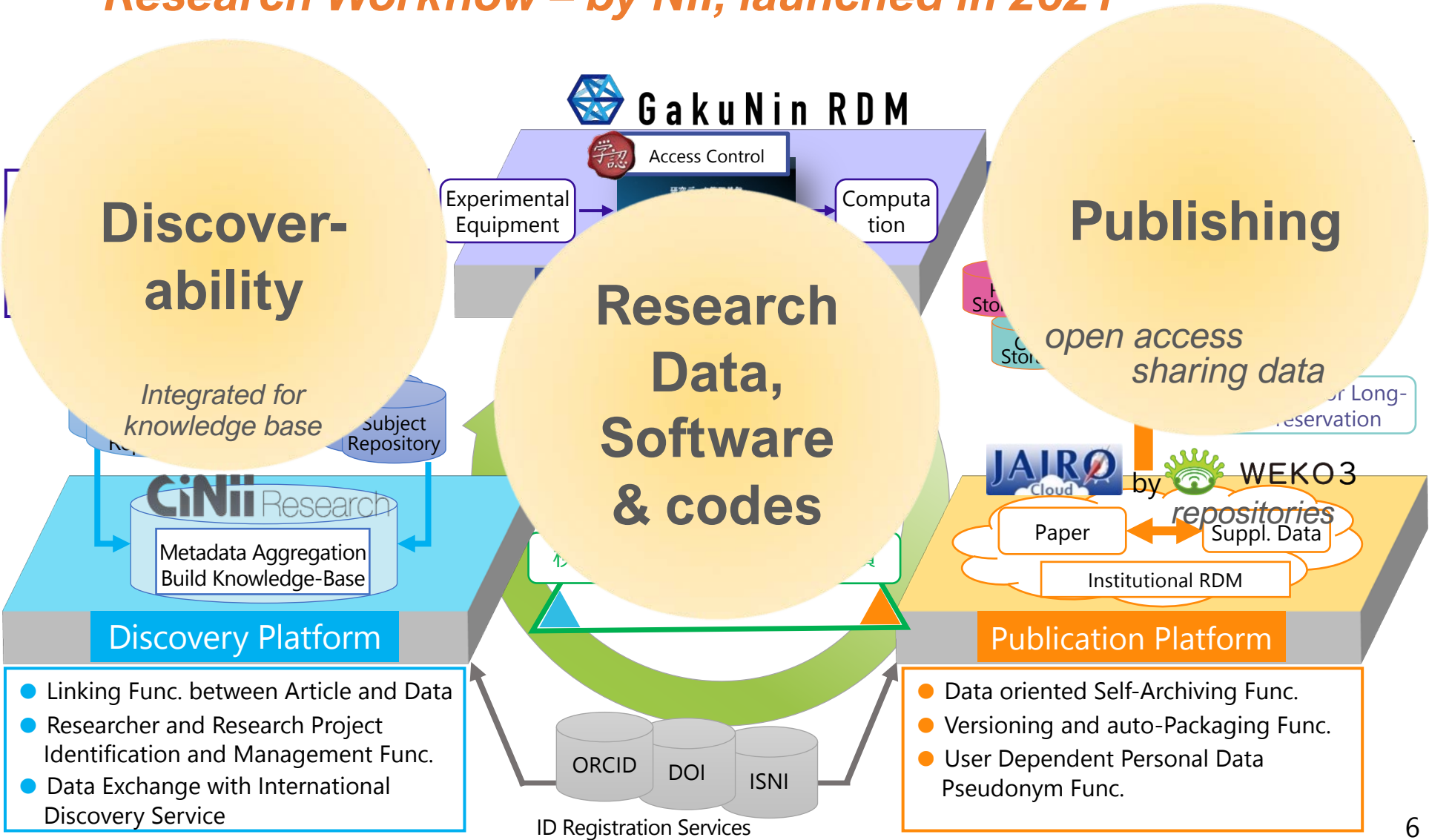


So much extra work to do

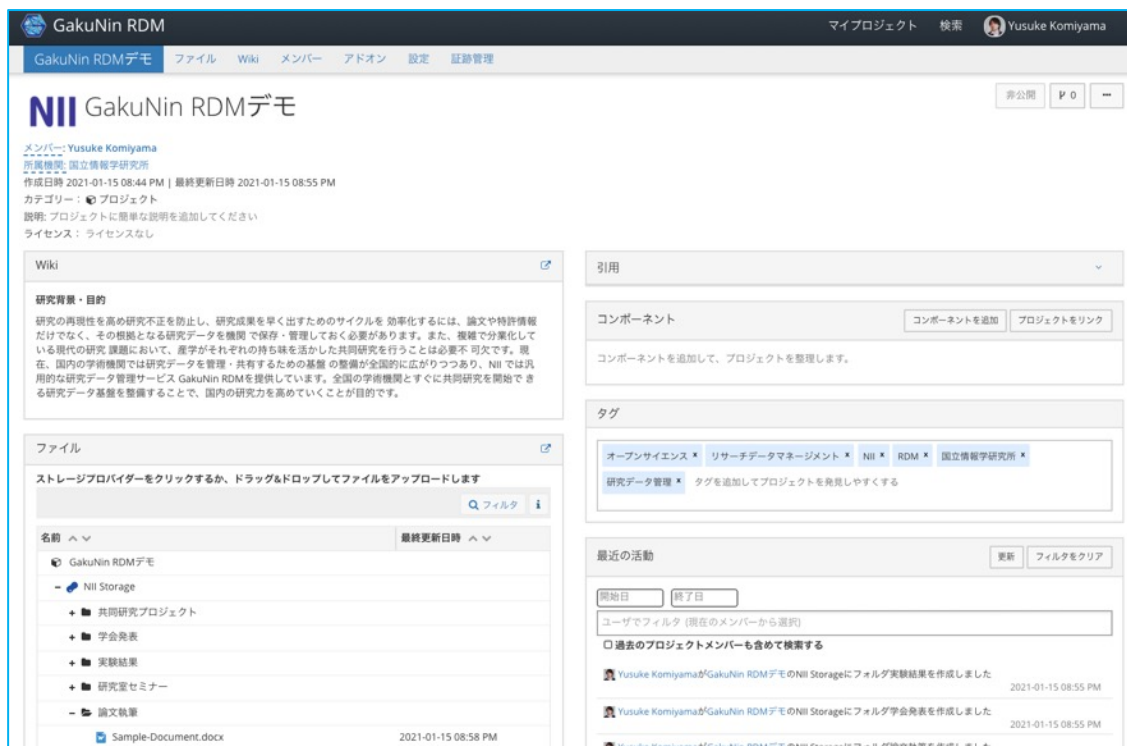
Positioning of GRDM as a Service Component within NII RDC

~NII Research Data Cloud – *RCOS*, since 2017~

Research Workflow – by NII, launched in 2021

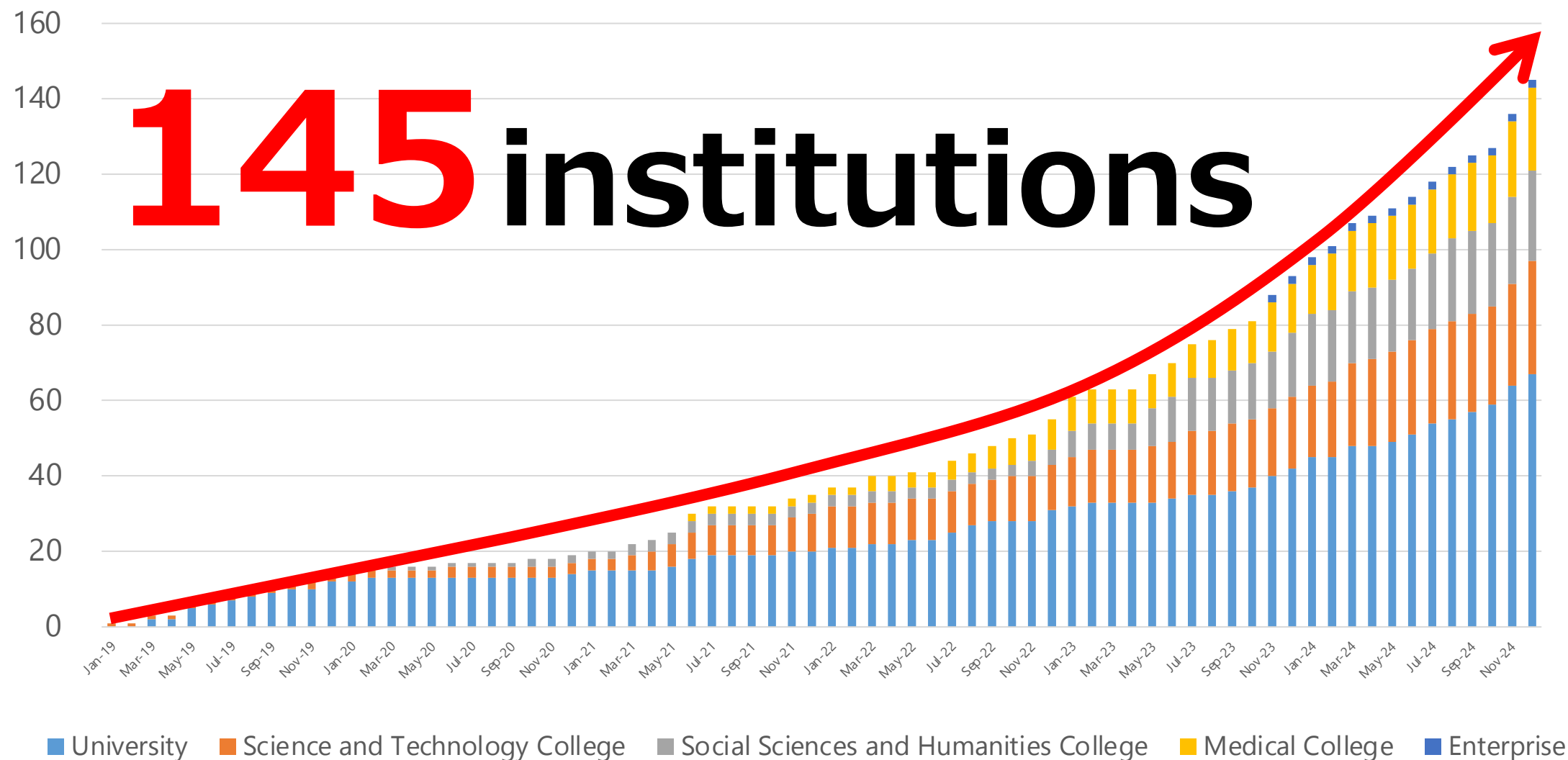


GakuNin RDM is a RDM service



GakuNin RDM is part of NII RDC, a research data infrastructure operated by NII, and specializes in handling closed (private, restricted sharing) data during research process. In April 2021, we started providing RDM service to academic institutions across Japan with an operational system. NII adopted Open Science Framework (OSF), developed by the Center for Open Science (COS) in the US, as the essential software for GakuNin RDM. NII has implemented new functions required for Japanese academic institutions.

Increase in the number of institutions using GakuNin RDM



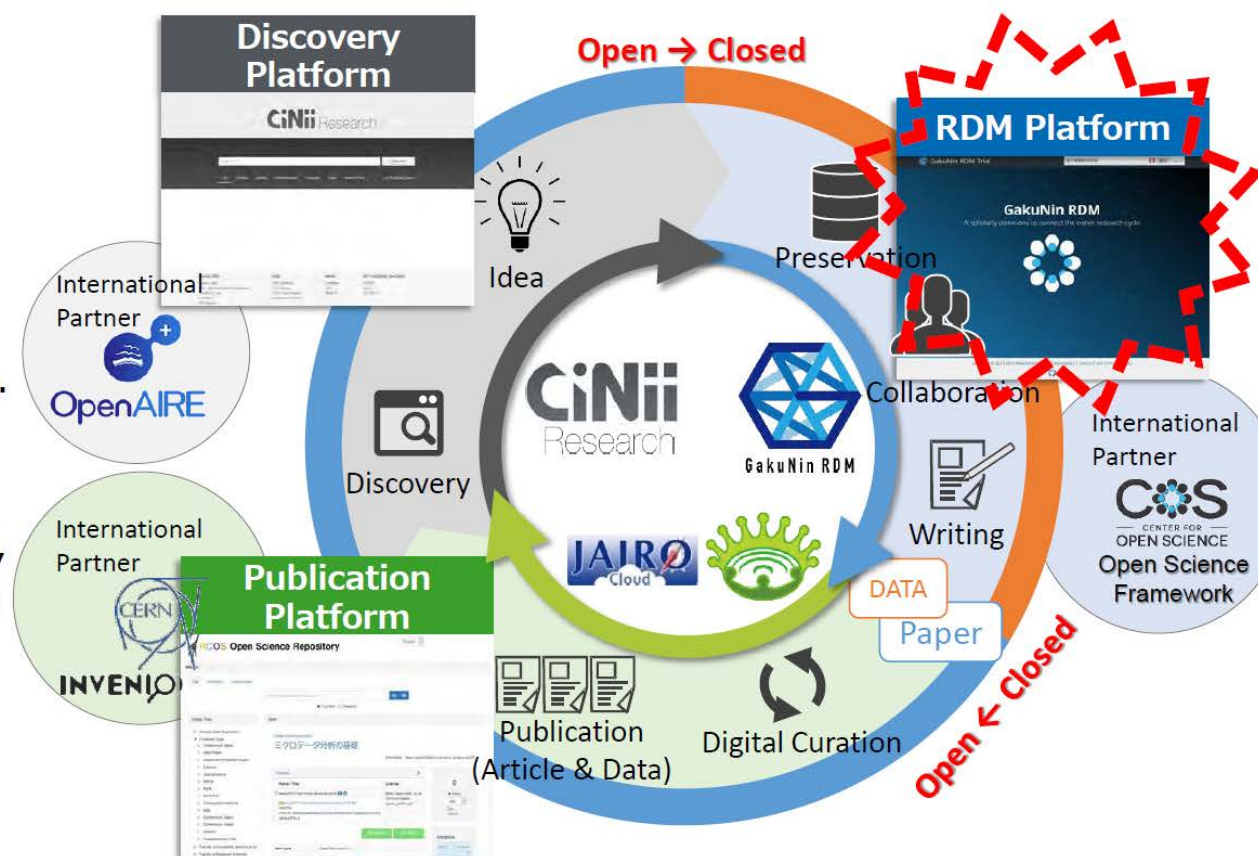
NII RDC supports Advanced RDM in Moonshot Project

IV. ADVANCED RESEARCH DATA MANAGEMENT



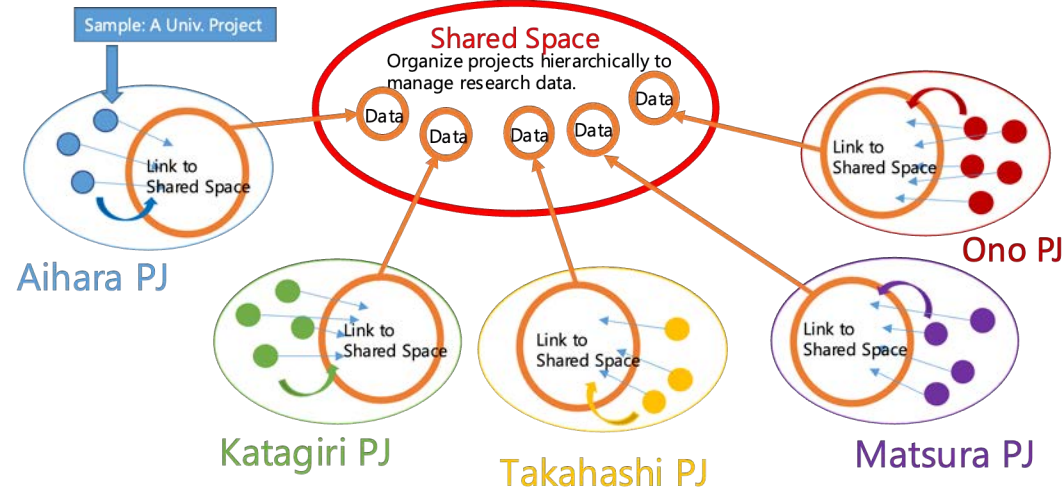
- We plan to provide a systematic methodology for assessing the whole Moonshot R&D package: marshaling research ideas, coordinating them into the collaborations with other researchers and outside stakeholders, and so on.
- We will achieve this through an advanced data management, which is closely related with the Open Science Framework that the EU and other countries are creating.

The Infrastructure for Open Science Based on “Open-Close Strategy”



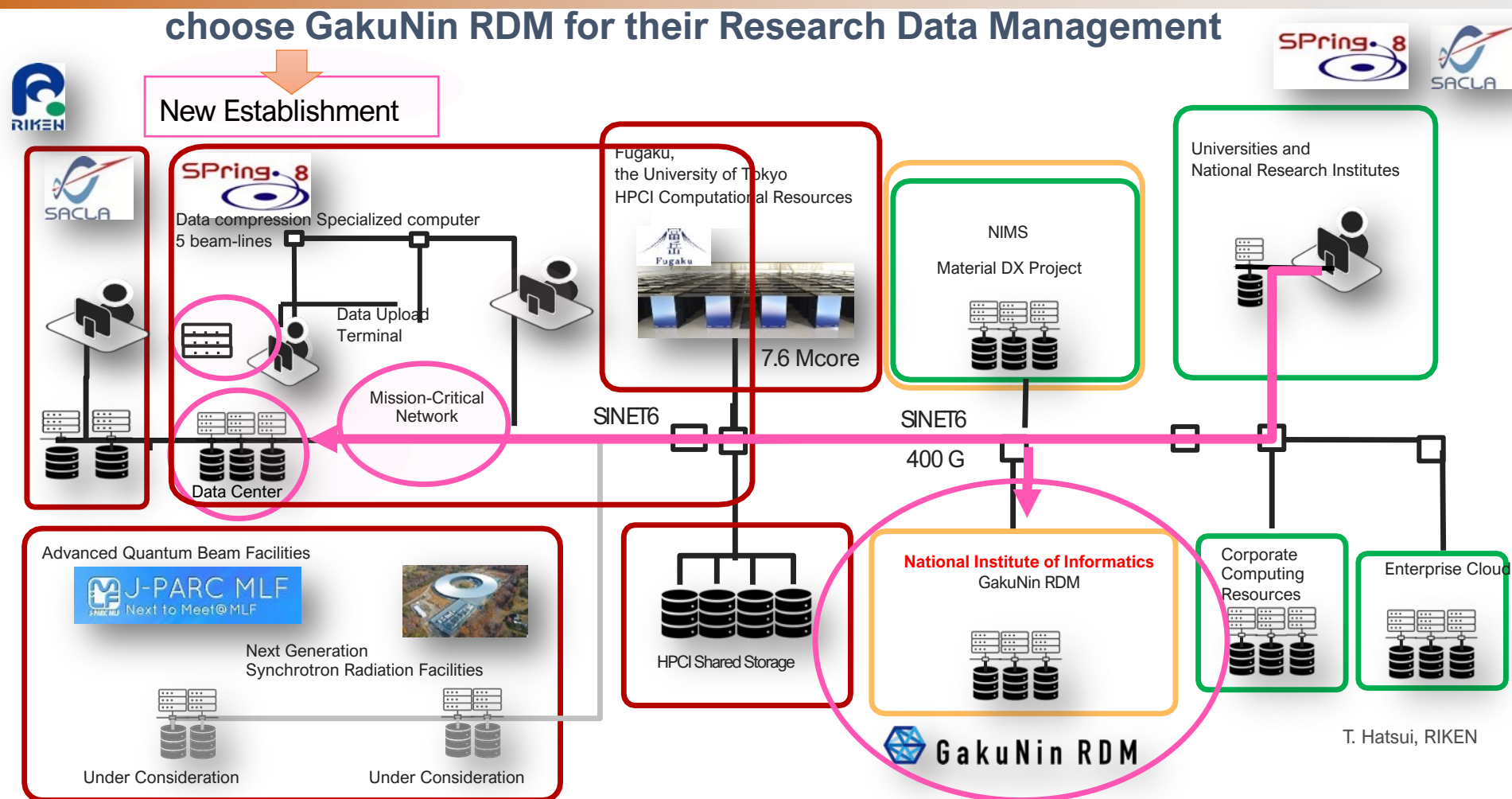
Data management platform of the pre-disease (Mibyo) database is responsible for data sharing in AMS Project

Shared Data Base of Pre-disease
for the Moonshot Goal2



The data management platform of the Pre-Disease (Mibyo) Database uses GakuNin RDM, and it is utilized for data sharing between medical researchers and mathematical researchers in the Aihara Moon Shot (AMS) project. In the pre-disease database, data is managed and shared by over 500 researchers across five projects under Moonshot Goal 2, with new data being uploaded daily.

Case Study with RIKEN SPring-8



RIKEN's SPring-8 is presently the most advanced synchrotron radiation facility in Japan. SPring-8 has launched a new data center for its users, with GakuNin RDM seamlessly connected to their storage infrastructure.

Walkthrough of Research Data Management

Research Data Management (RDM) service

Promoting Research Activity: GakuNin RDM is a web service for **researchers** to manage their own research data under data management plan, allowing them to connect and use various cloud storage and research software.

(1) Research data management and sharing function with AAI

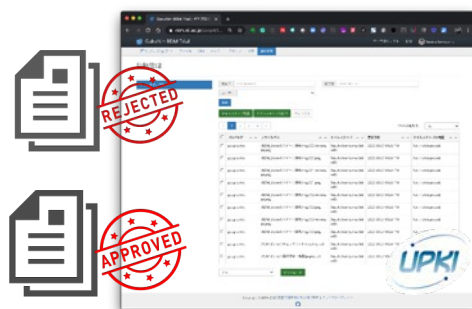


(2) Linking to the NII RDC and external research tools



Saving Research Integrity: GakuNin RDM is also a service for **universities and research institutions** to manage their affiliated researchers' research data for governance purposes. Institutions can customize their storage.

(3) Preservation of research data trails



(4) Administrative functions for institution



Fundamental function of research data management system using OSF

Specializing in the management of undisclosed research data

The screenshot displays the GakuNin RDM Trial interface for a project named "NII-OF2019". The interface is organized into several sections, each with a corresponding callout box:

- Title:** Points to the project name "NII-OF2019" at the top of the main content area.
- Contributors:** Points to the list of contributors: Yusuke Komiyama, Hidetoshi Yoshimoto, 平原 孝明, Masaharu Hayashi.
- Date:** Points to the creation date "作成日時 2019-05-26 10:47 PM" and the last update date "最終更新日時 2020-06-05 10:53 AM".
- License:** Points to the license information "ライセンス: CC-BY Attribution 4.0 International".
- Abstract:** Points to the "Wiki" section, which contains the project description: "2019年度のNII学術情報基盤オープンフォーラム用のプロジェクト".
- File Manager:** Points to the "ファイル" (Files) section, which lists various files including "NII-OF2019_AXIES-NII_Panel.pptx", "NII-OF2019_Contents-OS1_track_All.pdf", and "NII-OF2019_Contents-OS1_track_All.s.pdf".
- Citation:** Points to the "引用" (Citation) section, which includes a "コンポーネント" (Component) field and a "プロジェクトをリンク" (Link project) button.
- Related Projects:** Points to the "タグ" (Tags) section, which shows a list of tags: "オープンフォーラム", "GakuNin RDM", "GRDM", and "OF2019".
- Tags:** Points to the "タグ" (Tags) section, which shows a list of tags: "オープンフォーラム", "GakuNin RDM", "GRDM", and "OF2019".
- Recent Activity:** Points to the "最近の活動" (Recent Activity) section, which shows a list of recent actions, such as "Yusuke Komiyama updated wiki page Home to version 1 of NII-OF2019" and "Yusuke Komiyama added tag GakuNin RDM to NII-OF2019".

Metadata management function for publicly funded research data in GakuNin RDM

GakuNin RDM RCOS | メタデータ編集

メタデータ編集

データスキーマ: 公的資金による研究データのメタデータ登録

データ No.*

12345

データの名称 (日本語)*

ムーンショット型研究開発制度・サンプルデータ

Title (English)*

Sample Data of Moonshot Project

掲載日・掲載更新日*

2022-06-01

データの説明 (日本語)*

ムーンショット型研究開発制度・サンプルデータ

クリップボードから貼り付け

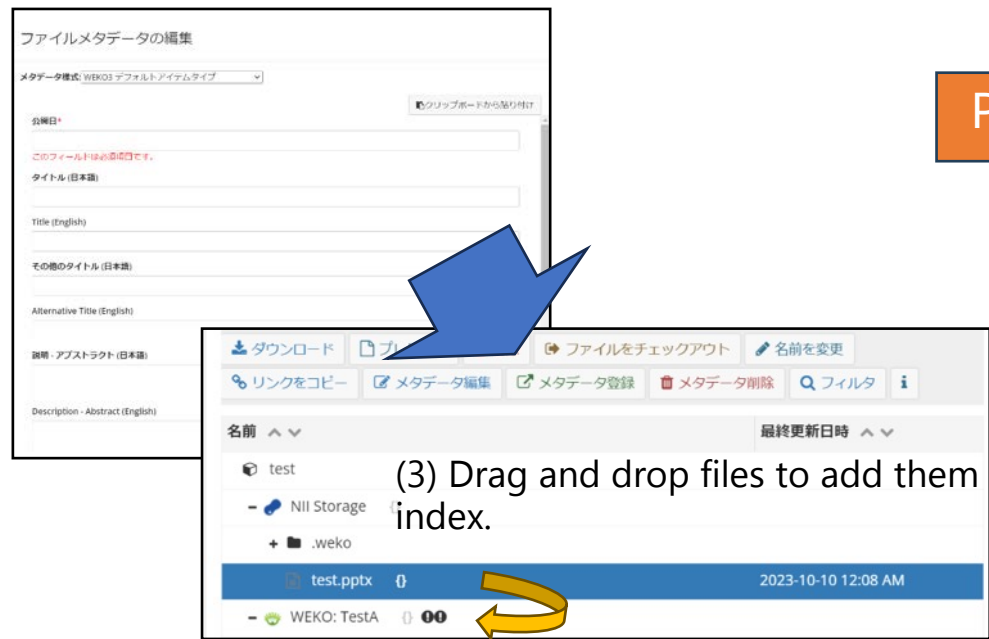
GakuNin RDM offers a feature that supports the registration of research data metadata specified by government agencies and funding organizations. It also supports the schema "Metadata Items for Publicly Funded Research Data Management and Utilization."

Data Publication Function to a Repository

(1) Connect the project on the management platform with the repository index on the public platform.

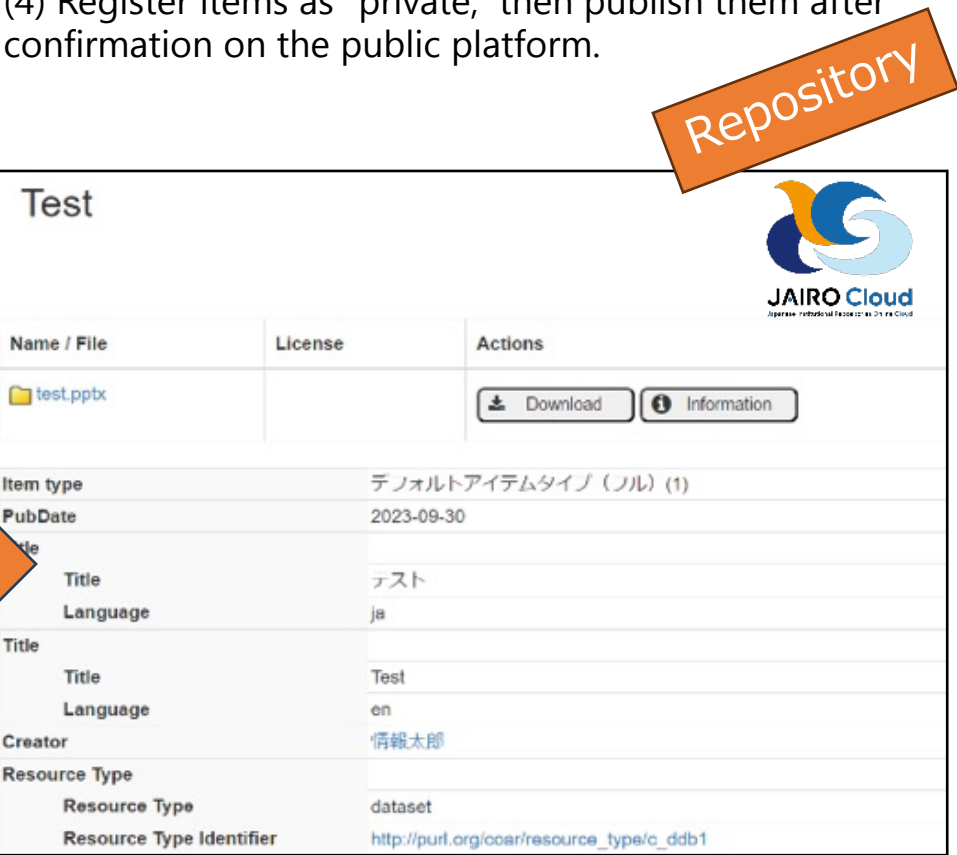


(2) Register the file metadata.



(3) Drag and drop files to add them to the index.

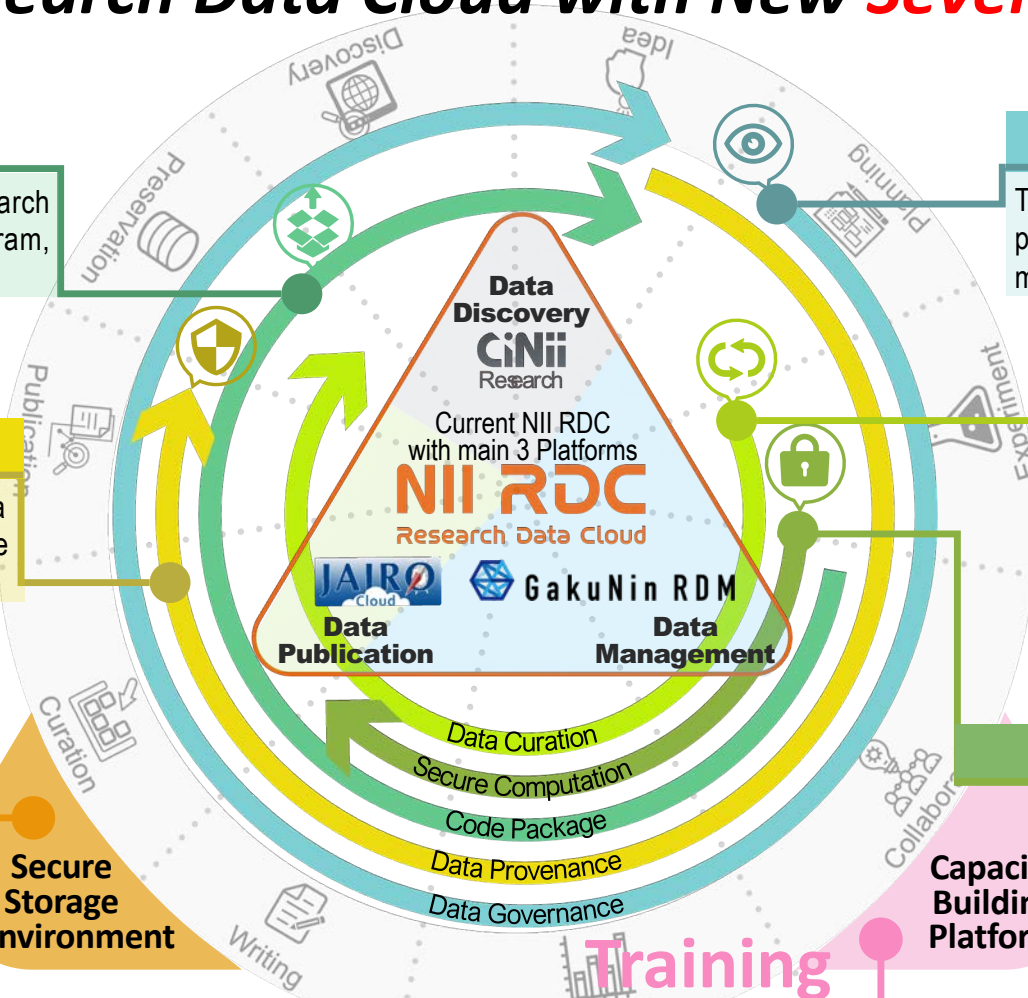
(4) Register items as "private," then publish them after confirmation on the public platform.



Publication

NII Research Data Cloud

Accelerate Open Science and Data Intensive Science by NII Research Data Cloud with New **Seven** Features



Summary

- 本講演では、日本国内における研究データ管理とオープンサイエンスの背景を紹介し、NIIリサーチデータクラウド（NII RDC）の概要と、研究データ管理基盤であるGakuNin RDMの事例や主要機能について説明しました。今後、GakuNin RDMはNII RDC内の他基盤やクラウドサービスとシステム連携を強化し、より多様な研究データ管理を実現することで、全国の学術機関へのサービス提供をさらに推進していく。
- In this presentation, I introduced the background of research data management and open science in Japan, provided an overview of the NII Research Data Cloud (NII RDC), and highlighted the case studies and key features of GakuNin RDM, a core research data management platform. Moving forward, GakuNin RDM will strengthen its integration with other components of NII RDC and various cloud services to enable more diverse research data management, further advancing its service delivery to academic institutions nationwide.

RCOS: Research Center for Open Science and Data Platform



RCOS
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