# Engaging Academia with Japan-wide Data Platforms and RDM Charter

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# Today's Talk

0. Japan, the Strange Country in the Far East
1. Where is Japan with Open Science?
2. Three Strategies to Engage the Academia in Japan
3. Quo Vadis?—Open Science in Japan

0

# Japan, the Strange Country in the Far East

# Where is Japan?

# Japan in the Middle

# Japan, an Isolated Country


- An Island
  - Little exchange and interference from outside country
  - Never been colonized
- Own Language
  - Difficult to learn
- 127mil. Inhabitants
  - Large enough market within the country

# Japanese Galápagos syndrome

- Japanese feature phone, called "Gala-kae."
  - Meaning, "Galápagos mobile phone"
  - Mobile phones in Japan in 2000-10 had almost same functionality as smart phones and using world's most advanced technologies.
  - However, it was sold and used just in Japan.

- Short mails, Emoji
- Internet-browsing
- Camera
- Calendar
- Information Service
- Contactless Wallet
- TV etc.

# Japan, a difficult country to stay

## Walmart to sell Japanese supermarket unit Seiyu

US giant reviews global strategy as it takes on Amazon

**Nikkei staff writers**
July 12, 2018 08:00 JST


Seiyu became Walmart's wholly owned subsidiary in 2008. (Photo by Wakako Iguchi)

- US universities in Japan
  - '80-'90s, approx. 30-40 branch campuses
    - ✓ Boom to set up branch campus in Japan
  - In 2009, only 4 campuses left.

# Japan, Raised to Work in Groups

Morning Greeting

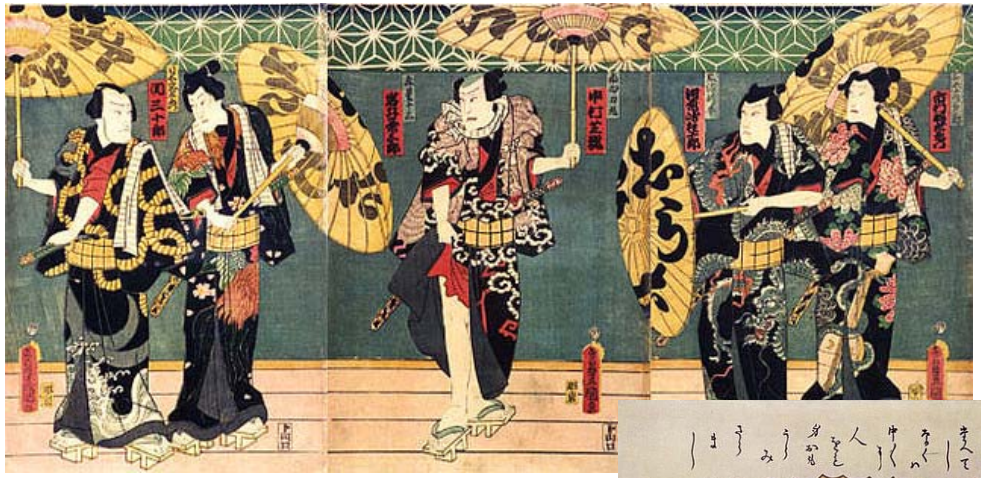
Cleanup

Lunch

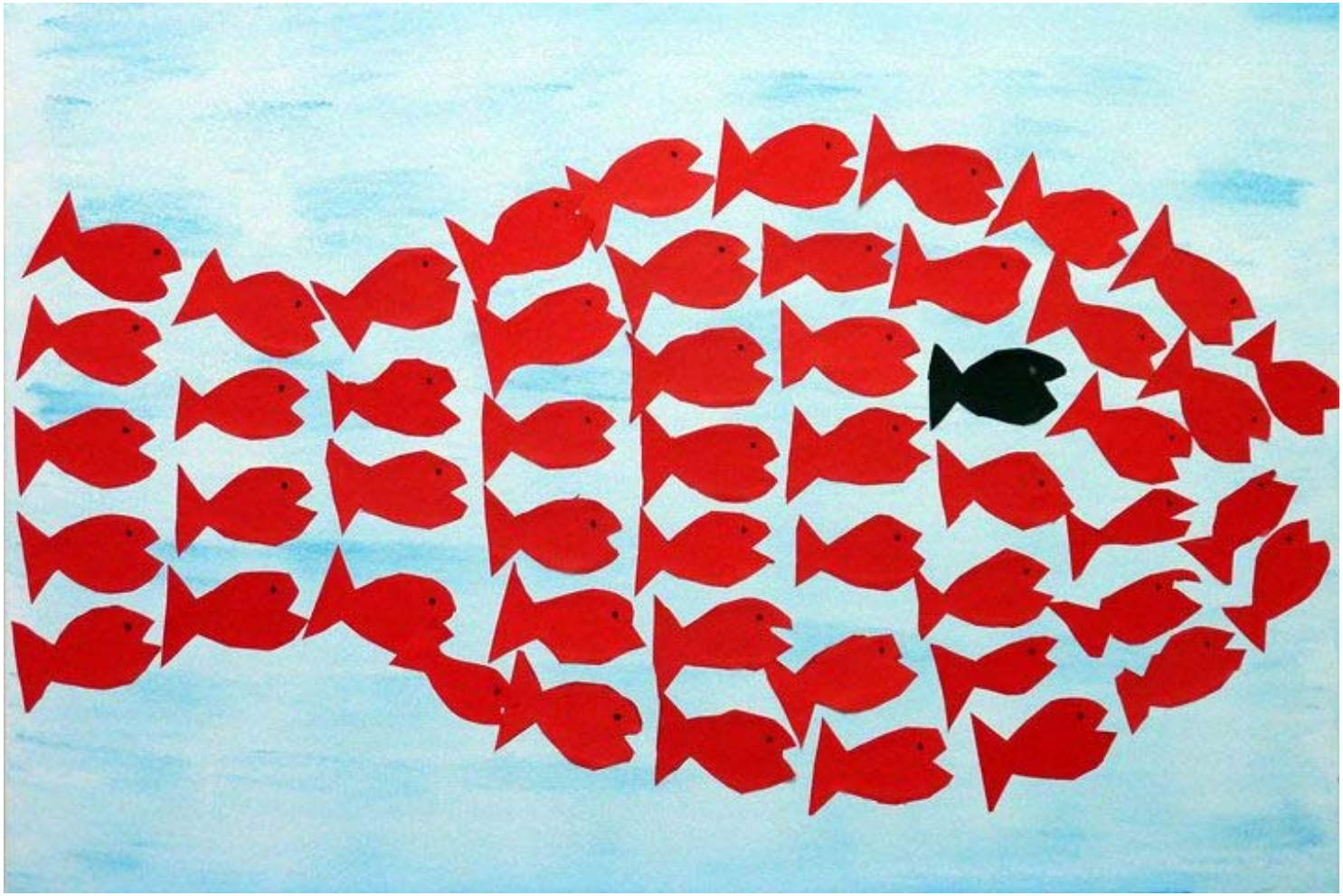
# Edo period (1603-1868) —Centrally governed and peaceful period


Sankin-kōtai (参勤交代 "alternate attendance")

# Edo period (1603-1868) —Culture among people flourishing



# Lauded acting as a group



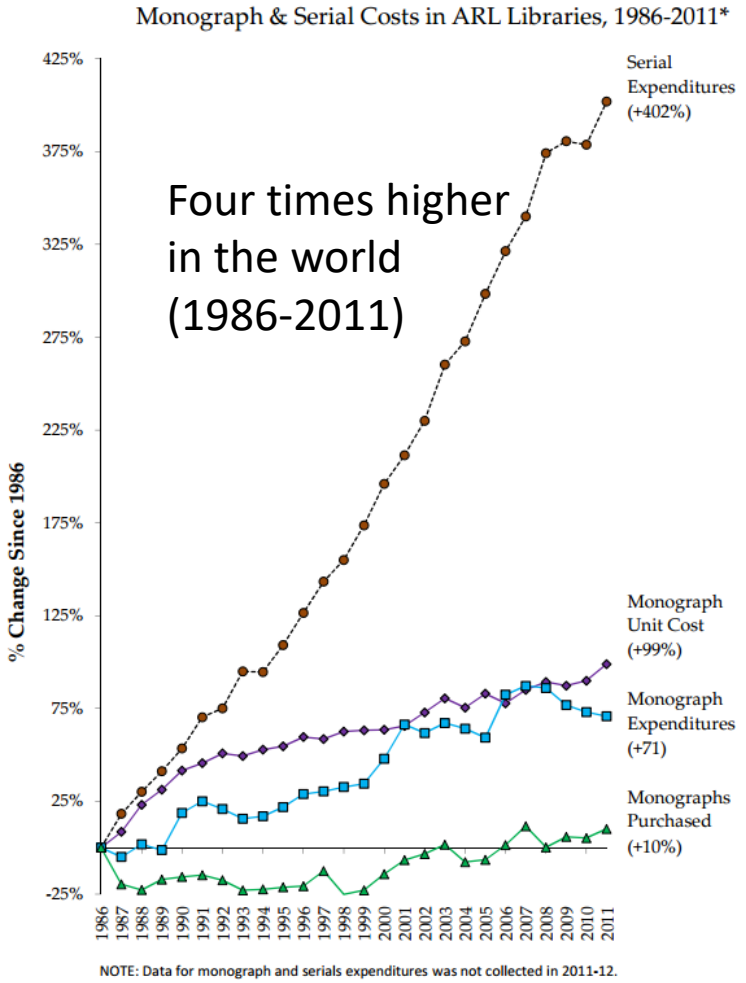
# 1

# Where is Japan with Open Science?

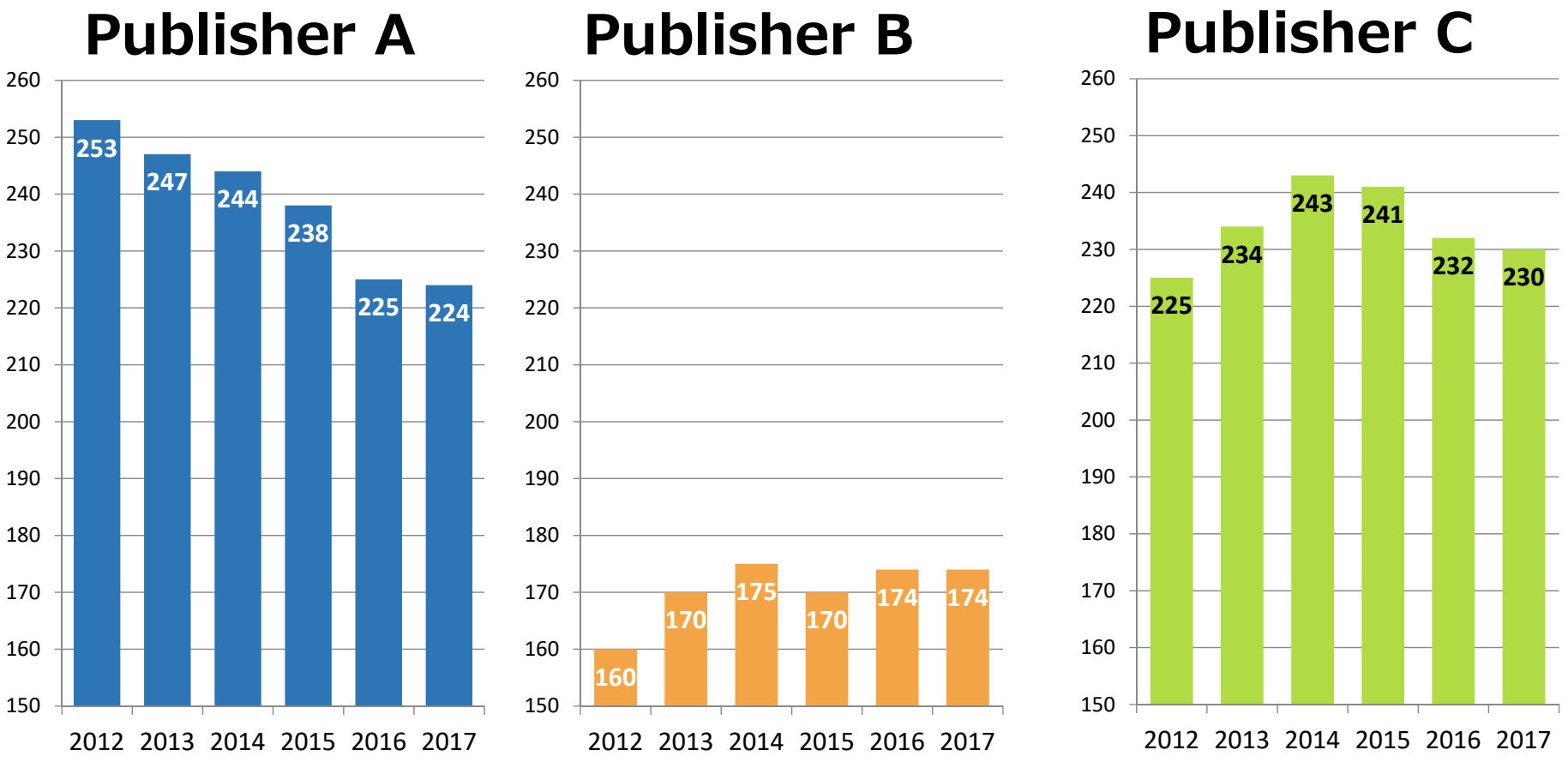
# Open Access of Research Publication—not well known outside library community

- Not really hit by serials crisis
  - Yen became 3 times stronger during 1986-2011.
  - Roughly half of Japanese researchers not affected as they write in Japanese.

*...Slowly feeling the pain these days as yen gets weaker.*



# Japanese universities slowly feeling the pain of journal subscription cost




Provided by Japan Alliance of University Library Consortia for E-Resources : JUSTICE

# Open Access Policy Developments in Japan

## Establishing Institutional Repositories

- NII Institutional Repositories Program (2005-2012)
- NII Institutional Repositories Cloud (2012-)
  - Japanese Institutional Repositories Online Cloud (JAIRO)

## Doctorate thesis OA mandate

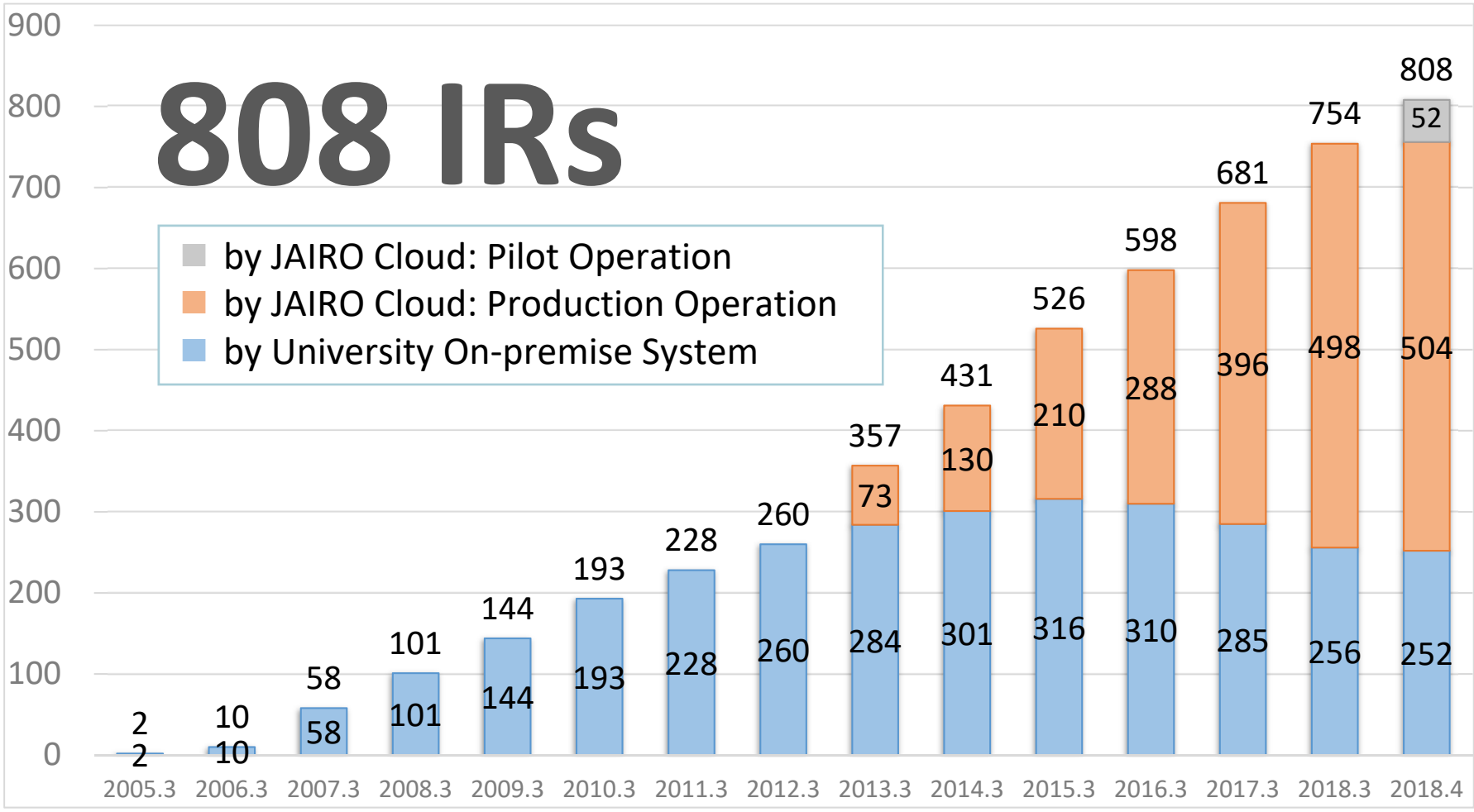
- Amendment of Degree Regulation by MEXT (2013-)

## Funding agencies OA policies

- JSPS OA policy (2017-)
- JST OA policy (2013-)
  - JST Open Science policy (2017-)

Mainly driven by conscious policy makers and library community.

# Japan, the No. 1 country by the number of institutional repositories



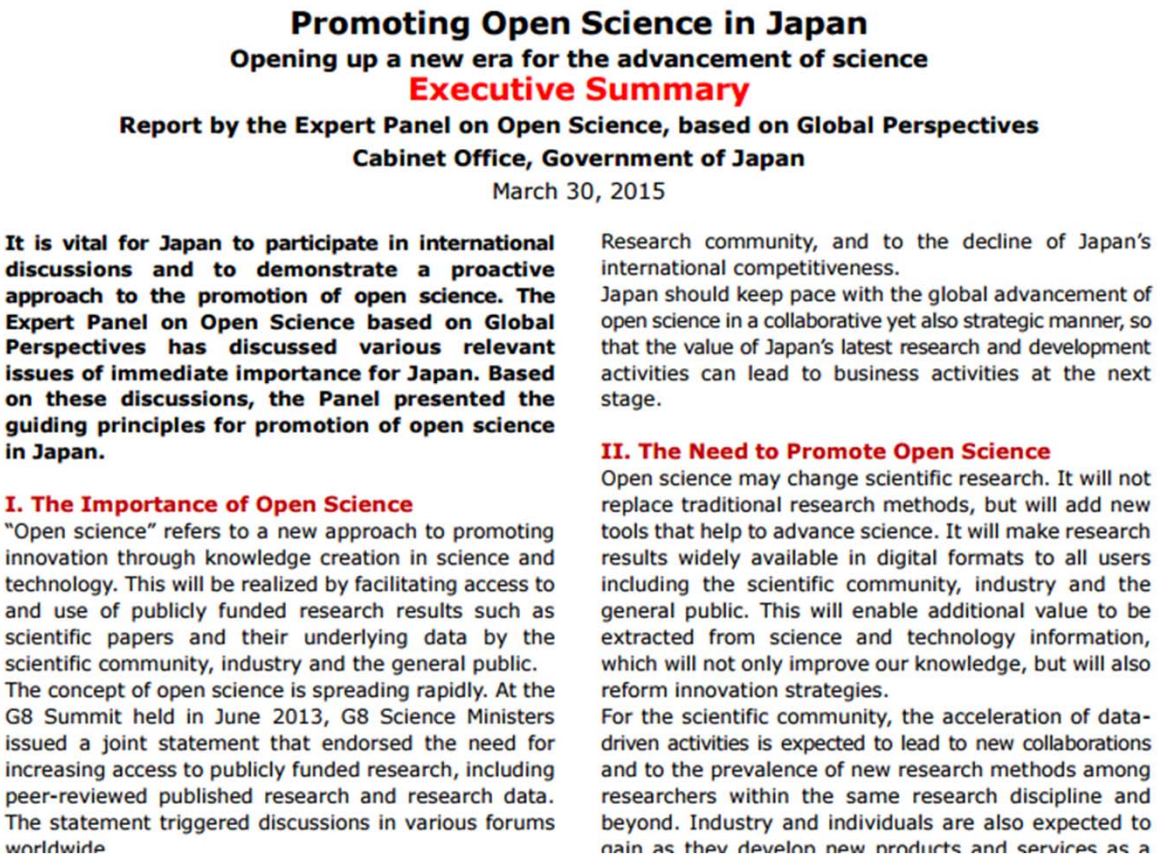
# Japan at OA crossroads?

- OA in Japan has been promoted by policymakers and the library community without the awareness of general academia.
  - Japanese OA policies rather in favor for green OA but not restricting.
- However, with OA2020 and Plan S, the world seems to be shifting strongly to gold OA.
- As the academia is starting to feel the pain, it is a good time to start discussion on OA.
  - However, the OA landscape is complex and most university administration don't take the time to understand!

# Policy Trends on RDM and Open Science in Japan

- June 2013: A joint statement by the G8 Science Ministers on making research data open
- March 2015: Cabinet Office, "Promoting Open Science in Japan“
- January 2016: "The 5th Science and Technology Basic Plan"
- February 2016: Council for Science and Technology, "Promoting Open Access to Academic Information"
- July 2016: Science Council of Japan (SCJ), "Recommendations Concerning an Approach to Open Science that Will Contributes to Open Innovation"
- June 2018: Headquarters for Japan's Economic Revitalization, "Growth Strategy 2018 - Reform towards Society 5.0 and Data-driven Society"
- June 2018: Cabinet Office, "Integrated Innovation Strategy"
  - *“Data infrastructure for Open Science” as one of three keys to make Japan an innovative country.*

# Open Science Report from Japanese Cabinet Office (2015)



**Promoting Open Science in Japan**

**Opening up a new era for the advancement of science**

**Executive Summary**

**Report by the Expert Panel on Open Science, based on Global Perspectives**

**Cabinet Office, Government of Japan**

March 30, 2015

**It is vital for Japan to participate in international discussions and to demonstrate a proactive approach to the promotion of open science. The Expert Panel on Open Science based on Global Perspectives has discussed various relevant issues of immediate importance for Japan. Based on these discussions, the Panel presented the guiding principles for promotion of open science in Japan.**

**I. The Importance of Open Science**

"Open science" refers to a new approach to promoting innovation through knowledge creation in science and technology. This will be realized by facilitating access to and use of publicly funded research results such as scientific papers and their underlying data by the scientific community, industry and the general public.

The concept of open science is spreading rapidly. At the G8 Summit held in June 2013, G8 Science Ministers issued a joint statement that endorsed the need for increasing access to publicly funded research, including peer-reviewed published research and research data. The statement triggered discussions in various forums worldwide

Research community, and to the decline of Japan's international competitiveness.

Japan should keep pace with the global advancement of open science in a collaborative yet also strategic manner, so that the value of Japan's latest research and development activities can lead to business activities at the next stage.

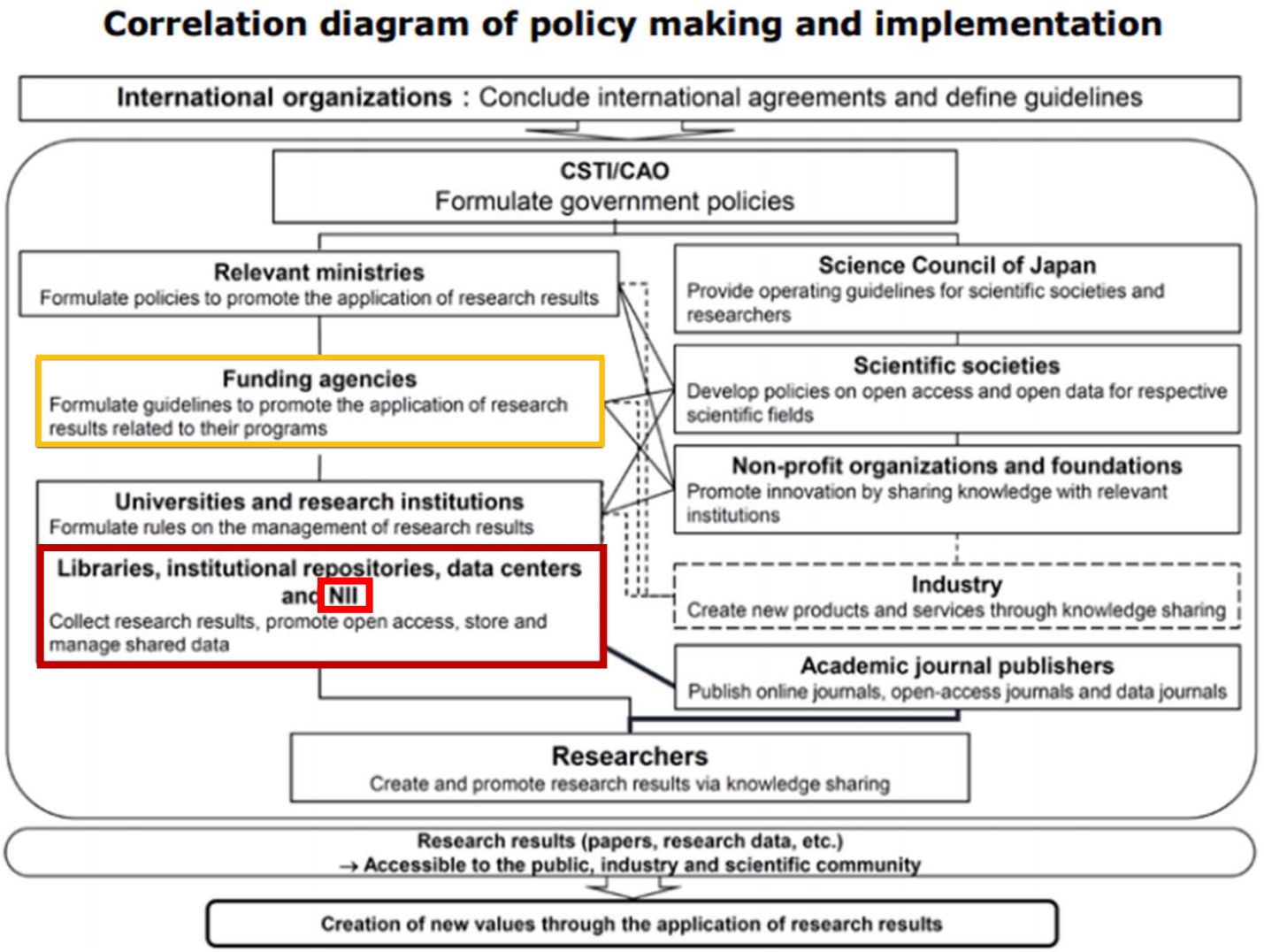
**II. The Need to Promote Open Science**

Open science may change scientific research. It will not replace traditional research methods, but will add new tools that help to advance science. It will make research results widely available in digital formats to all users including the scientific community, industry and the general public. This will enable additional value to be extracted from science and technology information, which will not only improve our knowledge, but will also reform innovation strategies.

For the scientific community, the acceleration of data-driven activities is expected to lead to new collaborations and to the prevalence of new research methods among researchers within the same research discipline and beyond. Industry and individuals are also expected to gain as they develop new products and services as a

http://www8.cao.go.jp/cstp/sonota/openscience/150330_openscience_summary_en.pdf

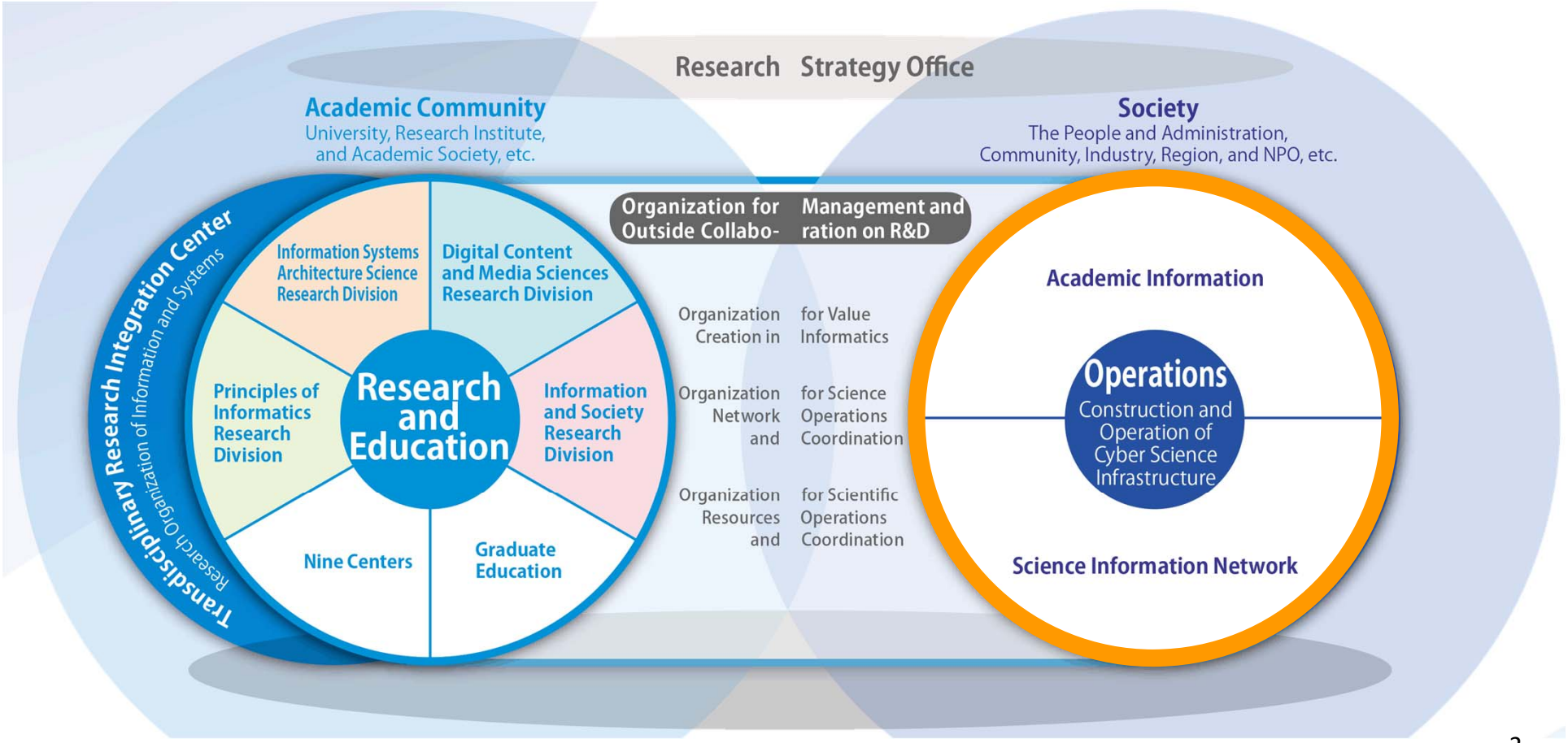
# Framework of the Open Science in Japan




http://www8.cao.go.jp/cstp/sonota/openscience/150330_openscience_summary_en.pdf

# Tandem Organization of NII

- The National Institute of Informatics (NII) seeks to advance integrated research and development activities in information-related fields, including networking, software, and content. NII also promotes the creation of a state-of-the-art academic-information infrastructure.



# SINET5

## 21st Century Academic Information Infrastructure for Advancing Open Science

### Collaboration and Promotion in Research and Education

SINET5

#### Resource

- Promotion of academic information circulation and open access
- Collaborative promotion of institutional repository expansion

CiNii

JAIRO Cloud

#### Federation

- Collaborative enhancement of authentication between universities

GakuNin Federation

eduroam

#### Cloud

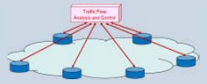
- Dramatic cost reduction and enhancement of research and education environment by tailored cloud services

GakuNin-Cloud Direct Connection

#### Security

- Network flow analysis and dynamic control
- Raise of security level for SINET users

Flow Analysis



VPN

#### Network

- Nationwide 100-Gbps backbone network and scalable network expansion
- High-speed direct international lines to USA, Europe, and Asia
- Introduction of new technologies such as SDN in response to user needs

# Brief History of NII

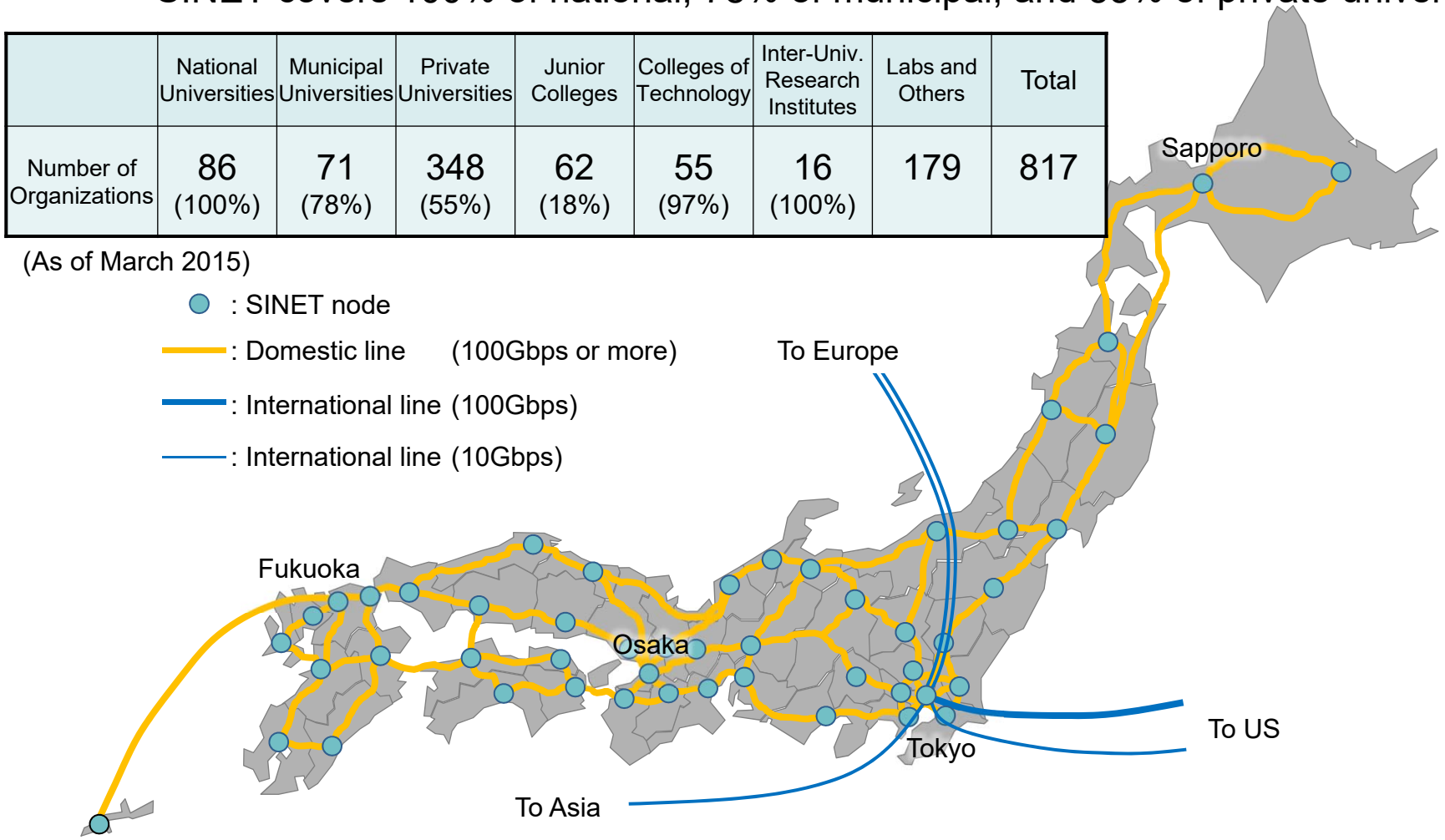
- *October 1973*: *Ministry of Education, Science, Sports and Culture proposes an "Improved Circulation System for Academic Information" in the Third Report (Basic Policies for the Promotion of Scholarship) of the Science Council.*
- May 1976: Research Center for Library and Information Science (RCLIS) is established at the University of Tokyo.
- April 1983: Center for Bibliographic Information is established at the University of Tokyo, with the reorganization of the Research Center for Information and Library Science.
- April 1986: National Center for Science Information Systems (NACSIS) is established, with the reorganization of the Center for Bibliographic Information, the University of Tokyo.
- April 2000: National Institute of Informatics (NII) is established, with the reorganization of NACSIS and assumption of its functions.

# NII is the Japanese NREN

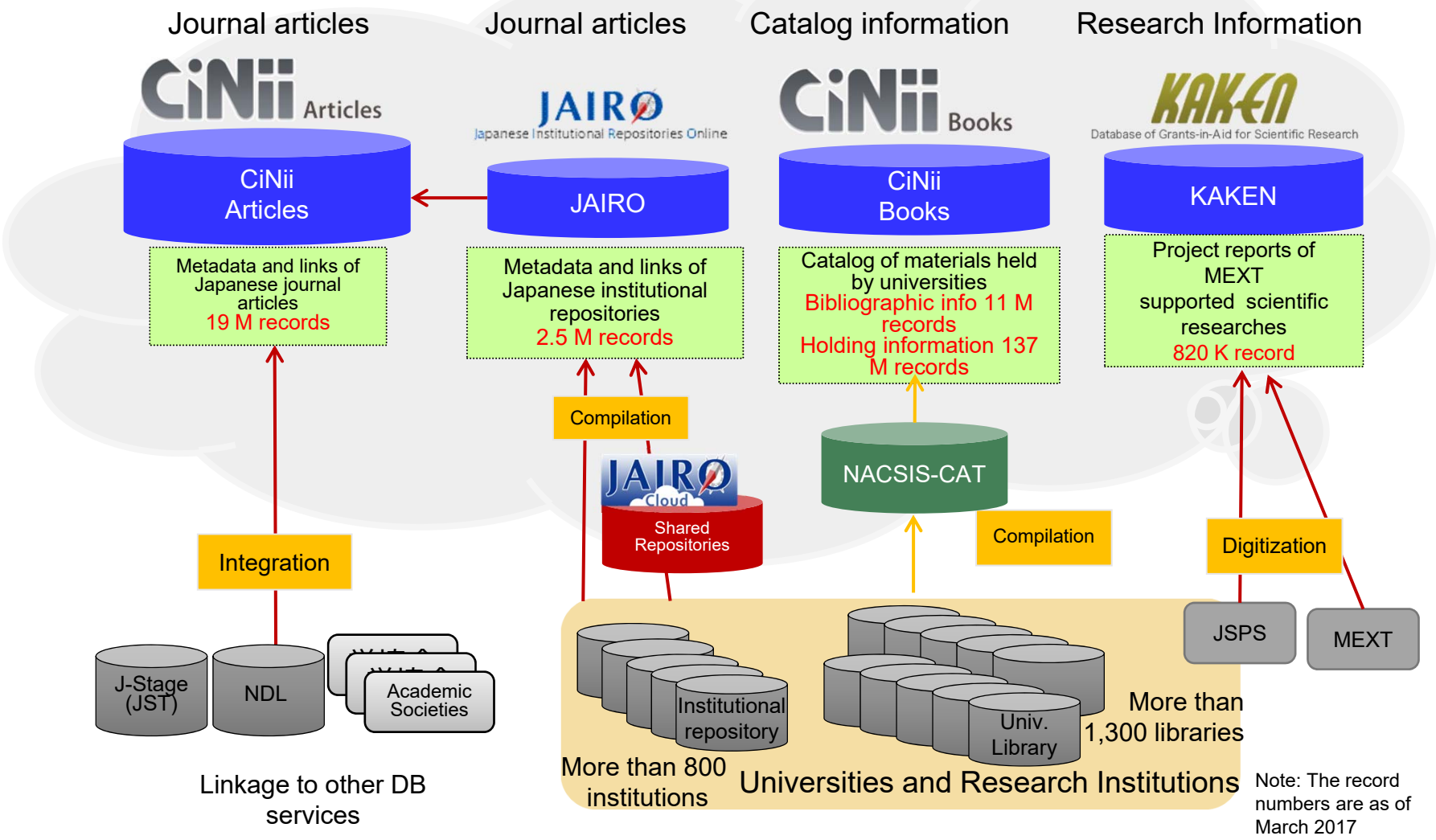
- SINET is a Japanese academic backbone network for more than 800 universities and research institutions, and for about 3 million users.
  - SINET covers 100% of national, 78% of municipal, and 55% of private universities.

| | National Universities | Municipal Universities | Private Universities | Junior Colleges | Colleges of Technology | Inter-Univ. Research Institutes | Labs and Others | Total |
|---|---|---|---|---|---|---|---|---|
| Number of Organizations | 86 (100%) | 71 (78%) | 348 (55%) | 62 (18%) | 55 (97%) | 16 (100%) | 179 | 817 |

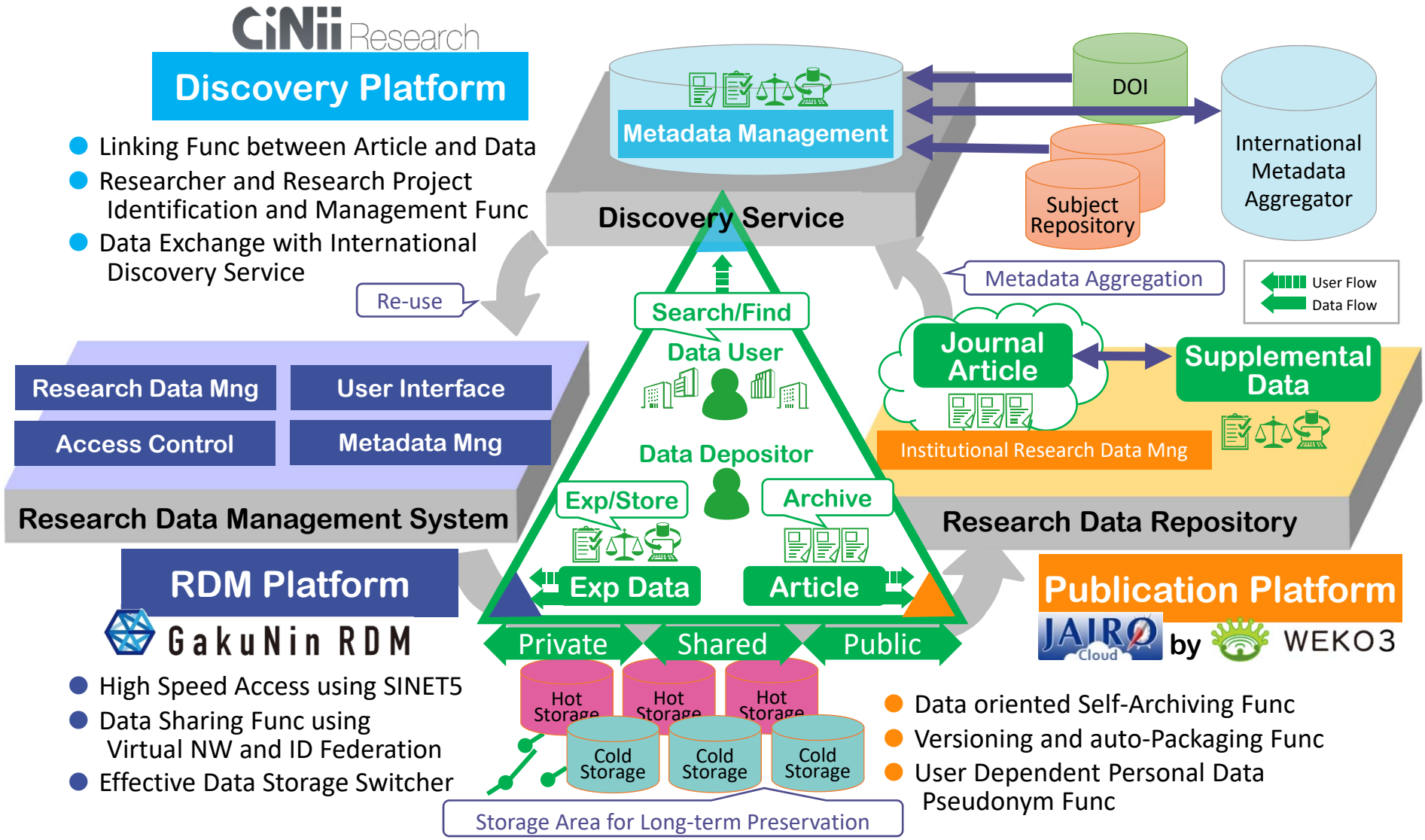
(As of March 2015)



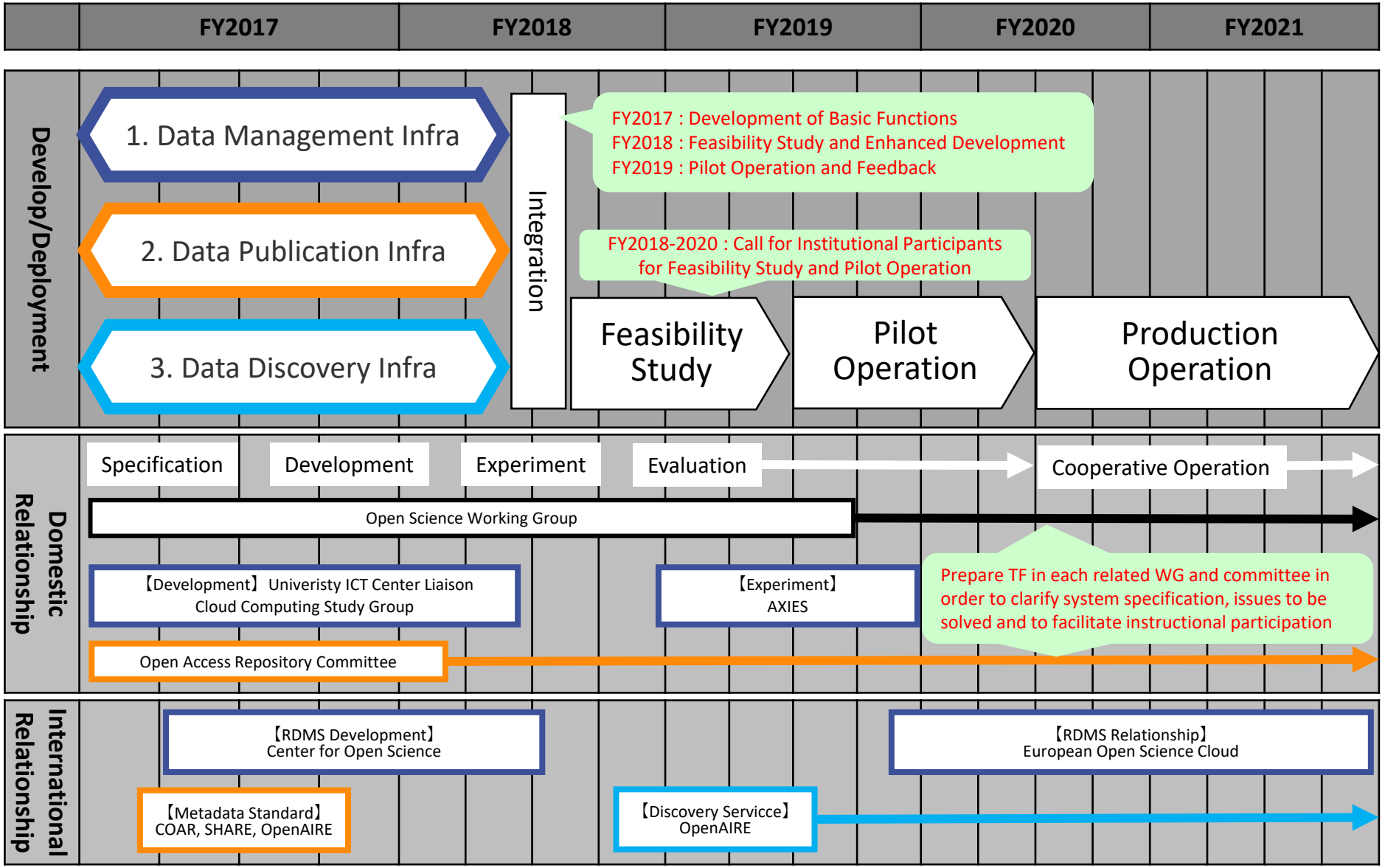
# Scholarly Information Infrastructure



# NII Research Data Cloud



# Planning


FY2017
FY2018
FY2019
FY2020
FY2021
Develop/Deployment
1. Data Management Infra
2. Data Publication Infra
3. Data Discovery Infra
Integration
FY2017 : Development of Basic Functions
FY2018 : Feasibility Study and Enhanced Development
FY2019 : Pilot Operation and Feedback
FY2018-2020 : Call for Institutional Participants for Feasibility Study and Pilot Operation
Feasibility Study
Pilot Operation
Production Operation
Domestic Relationship
Specification
Development
Experiment
Evaluation
Cooperative Operation
Open Science Working Group
【Development】 Univeristy ICT Center Liaison
Cloud Computing Study Group
【Experiment】
AXIES
Prepare TF in each related WG and committee in order to clarify system specification, issues to be solved and to facilitate instructional participation
Open Access Repository Committee
International Relationship
【RDMS Development】
Center for Open Science
【RDMS Relationship】
European Open Science Cloud
【Metadata Standard】
COAR, SHARE, OpenAIRE
【Discovery Servicce】
OpenAIRE

# In reality, the major driving force for RDM is scientific misconduct prevention

- MEXT: “Guideline for Dealing with Scientific Misconduct” (2014)

  「研究活動における不正行為への対応等に関するガイドライン」

  - Strengthening the guideline in 2006.
  - Holds institutions to be responsible for research transparency and preventing scientific misconduct.

- Science Council of Japan: “Reply: For the Enhancement of Soundness of Scientific Research” (2015)

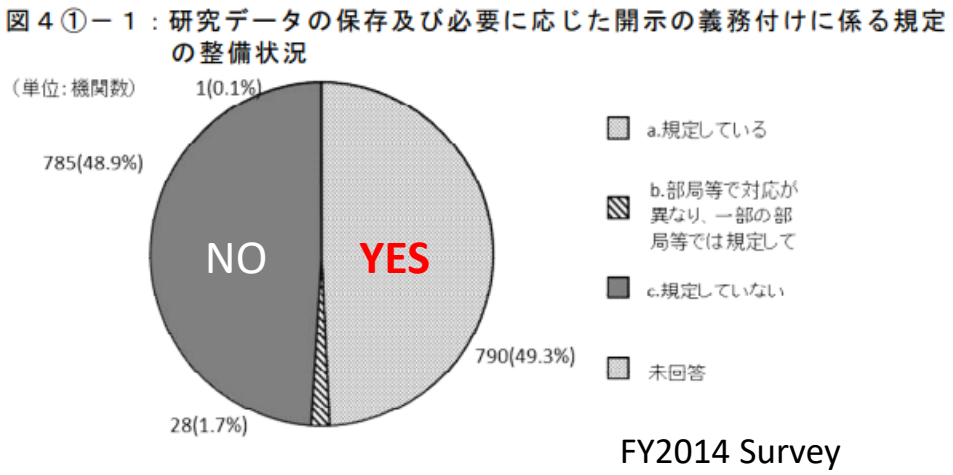
  日本学術会議「（回答）科学研究における健全性の向上について」

  - “Ten-Years Preservation Rule for Research Data”

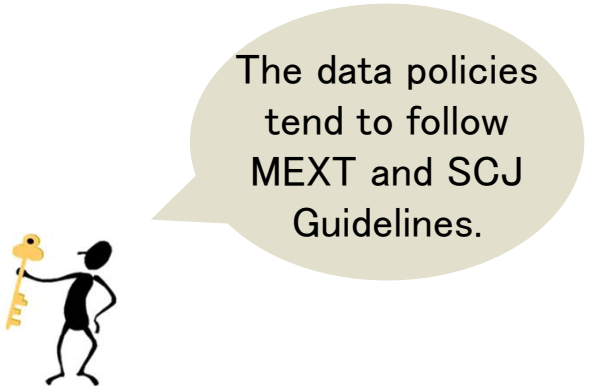
    研究データ10年保存ルール

# Japanese academic institutions having data preservation policies (FY2014 survey)

## Does your institution have an data preservation policy?




FY2014 Survey

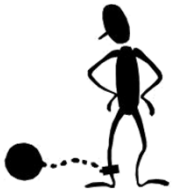



- Public institutions tend to have a data policy rather than private institutions.
- Institutions larger in size tend to have a data policy rather than small institutions.

# Implementation of data preservation at Japanese universities

- Introducing university-wide "Research materials preservation policy."
- Cascading of responsibilities:
  - ✓ University holds departments,
  - ✓ Departments holds Labs,
  - ✓ Labs holds researchers

  responsible for data preservation.



- No long-term storage, no infrastructural support

# Reporting of evidence-data for research articles at Japanese universities

- Research office sends out Excel spread sheet to researchers to have them report evidence-data.
  - ✓ Only single row to report,
  - ✓ No direct link to data
  - ✓ Data difficult to find.

Research Data Preservation List (研究データ保管管理簿)

保管管理者:
Name

| 関連No. | 発表テーマ・タイトル | 発表会議名等 | 発表日 | 保存期間 | データ破棄予定日 | データの保管場所等 | 保存する研究データ等 | データ破棄日 | 備考 |
|---|---|---|---|---|---|---|---|---|---|
| No. | Title of Research Article | Conf.Name | Date | Prsv. Perio | Data delete planned | Storage place | Preserving data | Data deleted date | Other |
| | | | | 5年 | | | | | |
| | | | | 5年 | | | | | |
| | | | | 5年 | | | | | |

Source: Kyushu Institute of Technology, "Policy for the Prevention of Research Misconduct" 2014
https://db.jimu.kyutech.ac.jp/cgi-bin/cbdb/db.cgi?Page=DBRecord&did=206&nid=230

# Open Science in Japan still at its infancy

- OS in Japan in mainly driven by policymakers and infrastructural work by NII.
  - The term OS is becoming familiar but most people do not understand what it means.
- Strong emphasis on research data preservation to prevent scientific misconduct.
  - In this case, data does not need to be open.
- Need to merge these two issues and direct RDM in Japan for positive purpose.

2

# Three Strategies to Engage the Academia in Japan To RDM

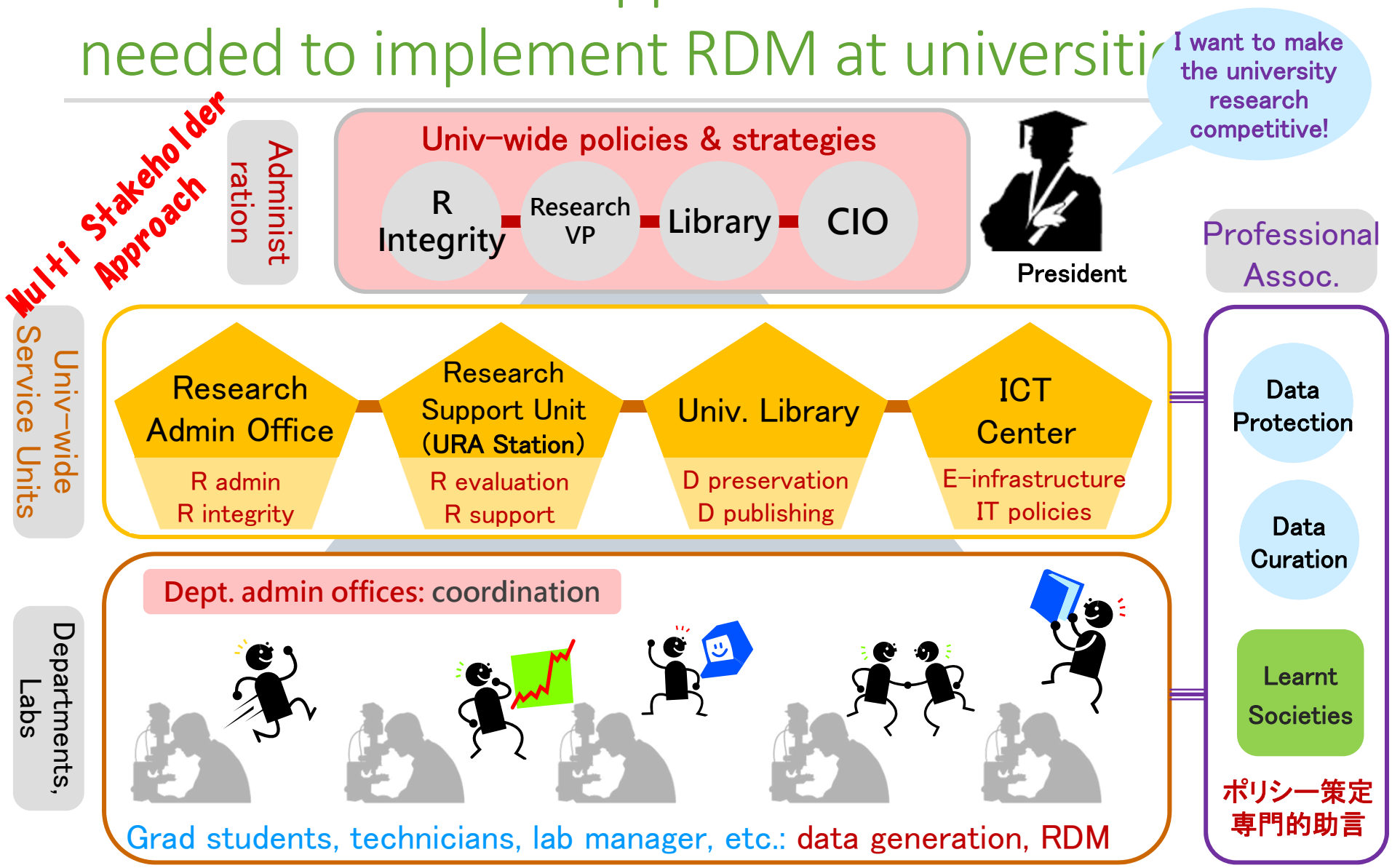
# Three Strategies to Engage the Academia in Japan to RDM

1. National RDM infrastructure for active research
2. RDM Charter for acad. institutions
3. RDM Guideline at acad. institutions

# Necessity to engage the Japanese academia into Open Science

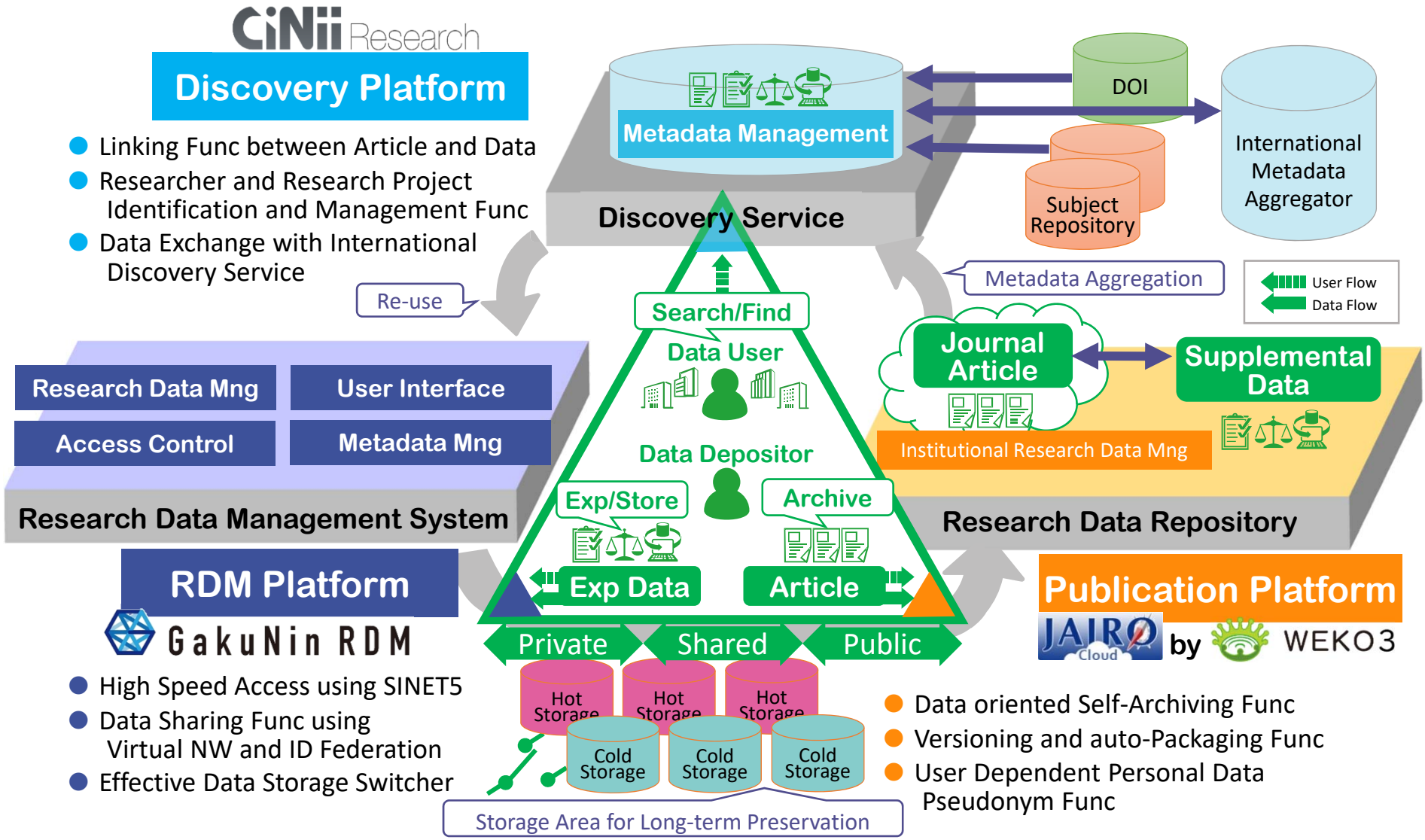
1. The idea of OA and OS not well understood.
2. RDM in an academic institute involves multi-stakeholder approach.
   - Meaning, nobody takes leadership to start OS.
   - Hiring RDM manager does not work if there is no RDM policy justifying his/her work.
3. Need to direct RDM at Japanese universities to positive direction.
   - Implementing RDM for the sake of scientific misconduct prevention does not make researchers happy.

# Multi-stakeholder Approach needed to implement RDM at universiti



# 1 National RDM infrastructure for active research

# NII Research Data Cloud

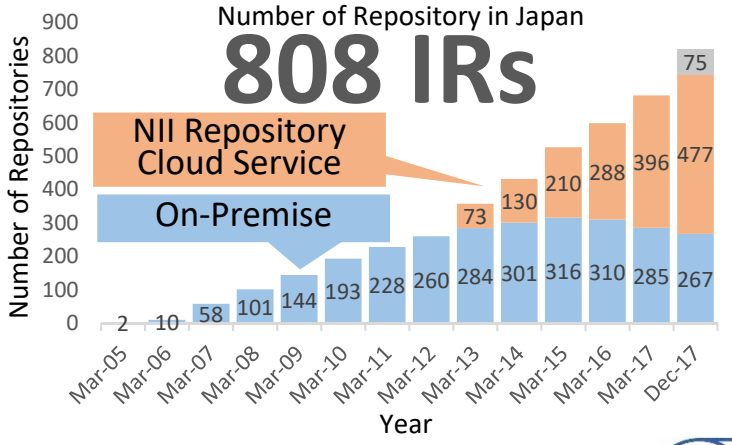


Publication Platform

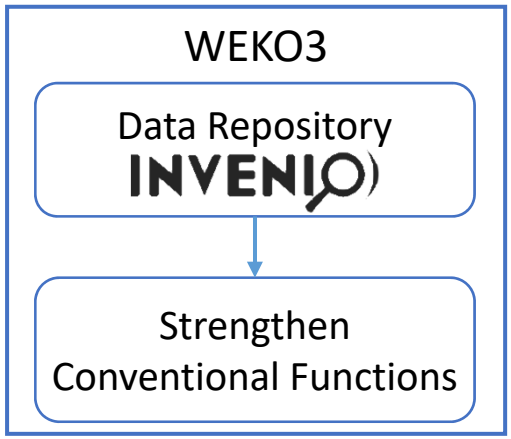
# WEKO3

- **Current System WEKO2**
  - Journal Article Repository
  - Add Functions more and more

Research Data Handling




- **New System WEKO3**
  - Based on Invenio3 which is originally focused as Data Repository
  - Integrate WEKO2 Functions into Invenio3



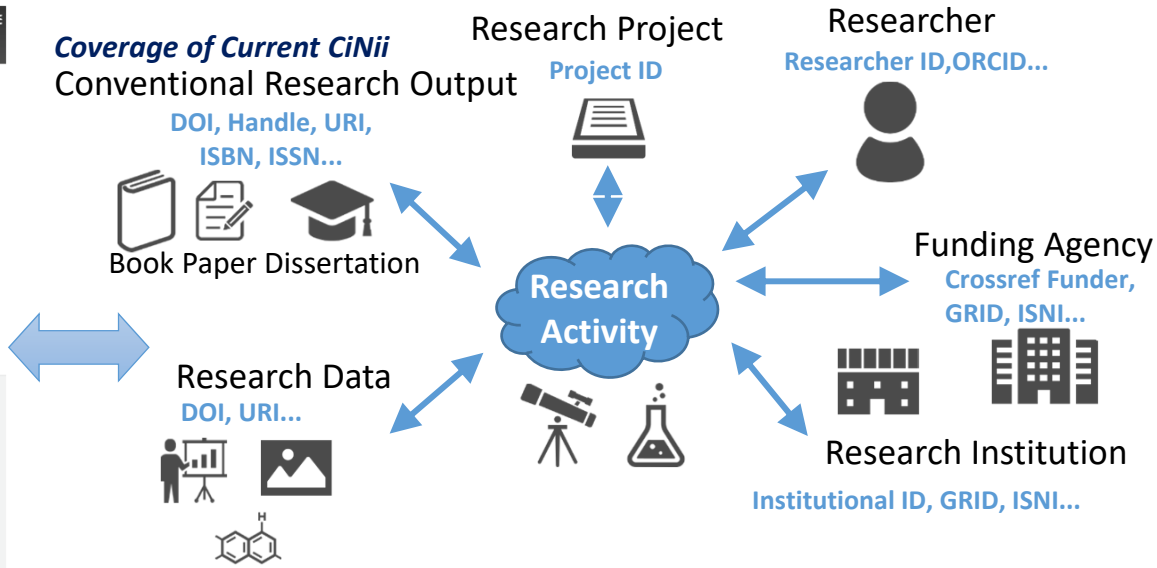

Realize New Publication Platform based on sophisticated Invenio3 Architecture
(Invenio3 = our RDM Platform in Architecture)

- Effective Development and Operation
- Domain Use-case by Extensibility

Discovery Platform

CiNii Research


- **NII Knowledge Graph**
  - Aggregate from various DBs
  - Define Entity Links
- **User Interface**
  - Support Discovery Experience for Research Activity Itself



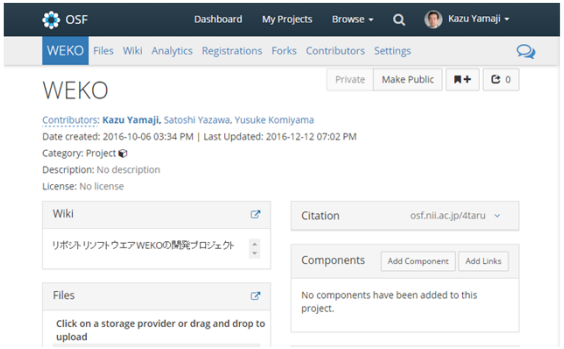

Exchange Data with International Discovery Services

RDM Platform

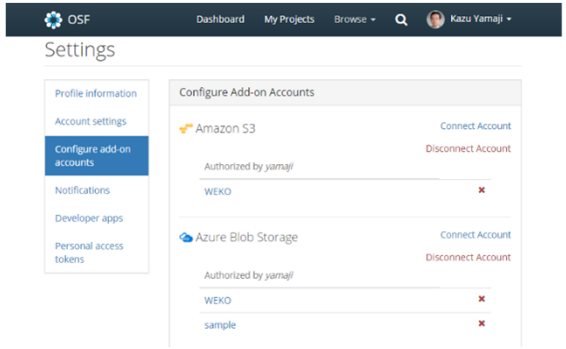
# New Service GakuNin RDM

## Extension of Open Science Framework developed by COS, USA

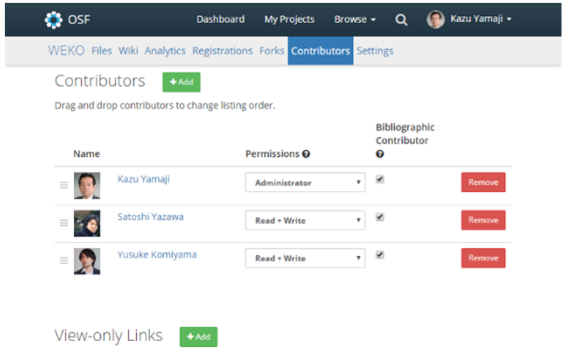
### Manage Research Data by Research Project




### Connect Cloud Storage from Various Plugin




### Share Research Data within Collaborators Authn by ID Fed




NII: Frontend Service

University: Backend Storage

RDM Platform

Cloud Storage

NII Storage

Customize selectable Plugin depending on University Environment and Policy

Default (minimum?) Storage by NII

Public Cloud (Provider DC)

Private Cloud (On-premise)

Public Cloud (Provider DC)

RDM Platform

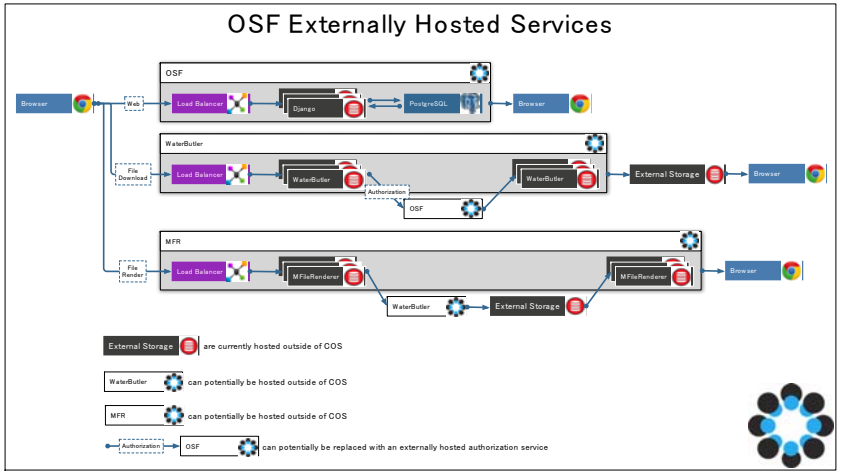
# In collaboration with Center for Open Science (COS)

## NII visited COS office last year

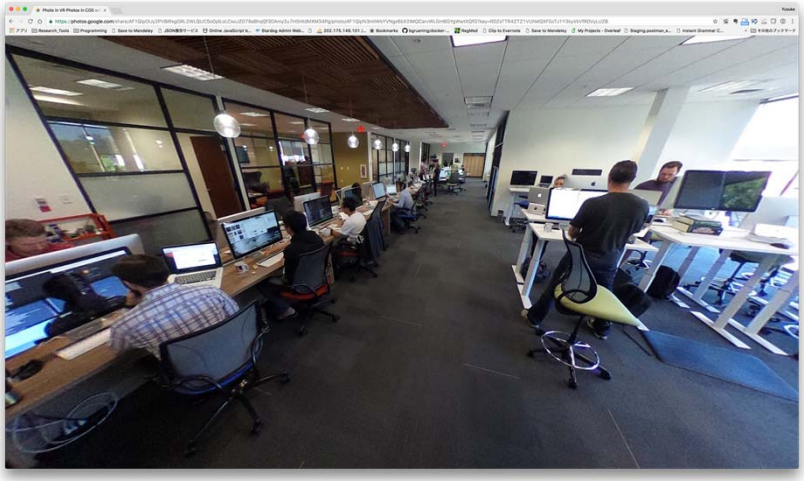
**CenterForOpenScience** @OSFramework · Sep 14

Great visit yesterday from @takechan2000 and @YusukeKomiyama from NII Japan nii.ac.jp/en/ Thank you!

## NII—COS technical collaborations

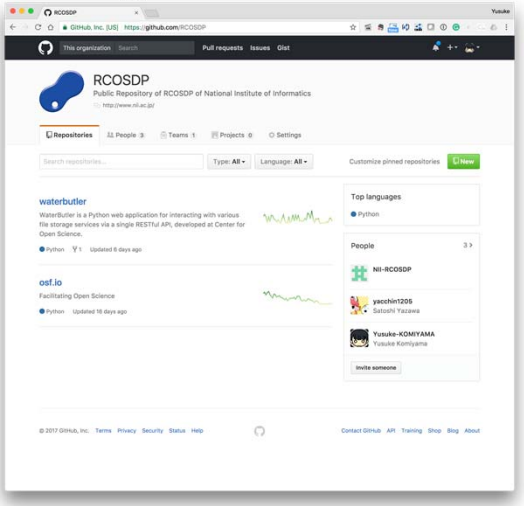



## COS office in Charlottesville, VA, US



https://goo.gl/photos/WmoHMVs3s7ouDbBN9

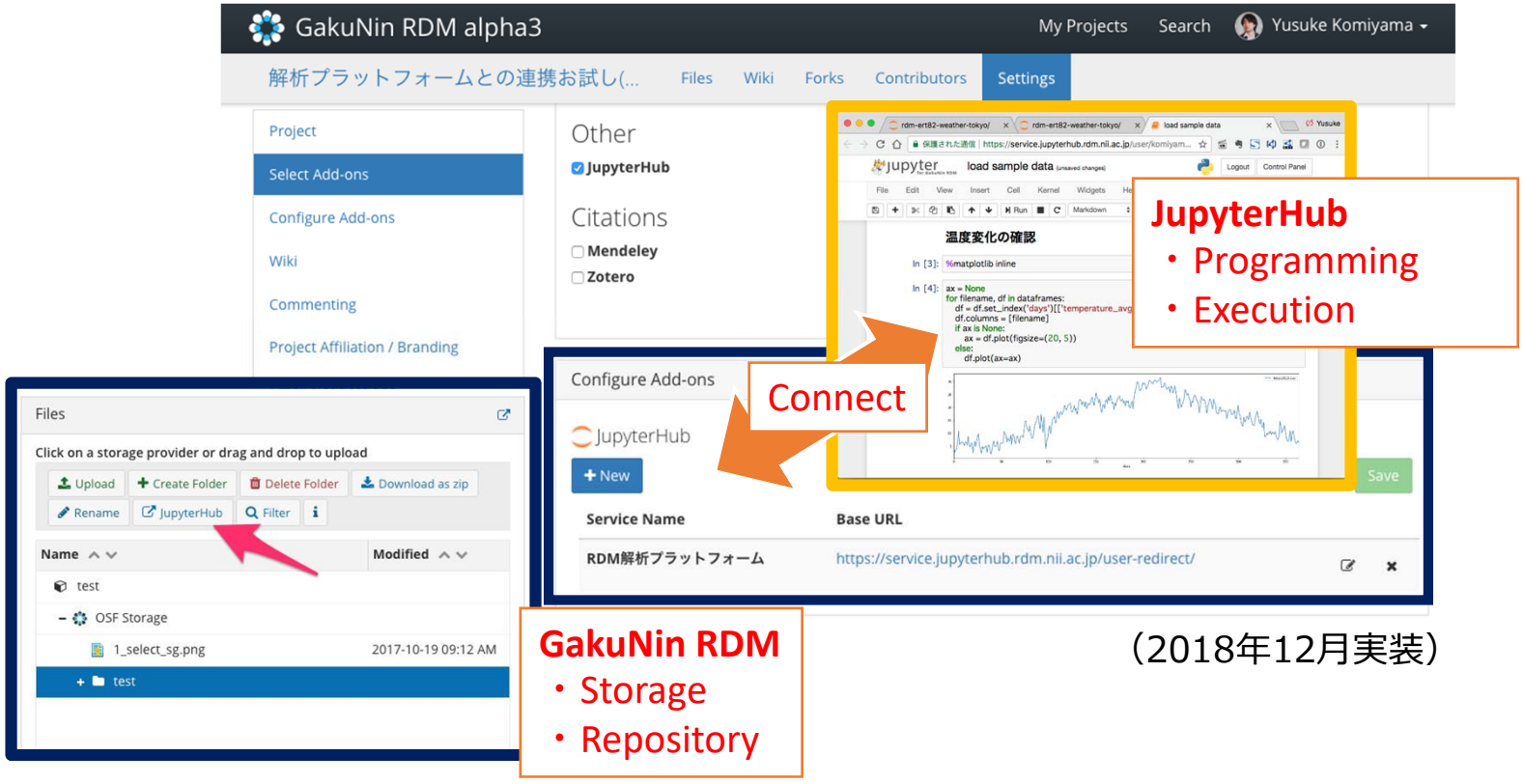
## Source cord sharing with NII



# Functions Developed for RDM Plaform

- New Plugin
  - New External Storage
    - ownCloud, S3 Compatible Storage, OpenStack Swift
  - Integration with Publication Platform
  - Integration with Data Analysis Tool
    - JupyterHub
  - Plugin SDK
- Research Data Management
  - Research Footprint Management
  - Metadata Management
  - Workflow Management
- Institutional Management
  - Plugin Selection
  - Statistics
  - Institutional Template

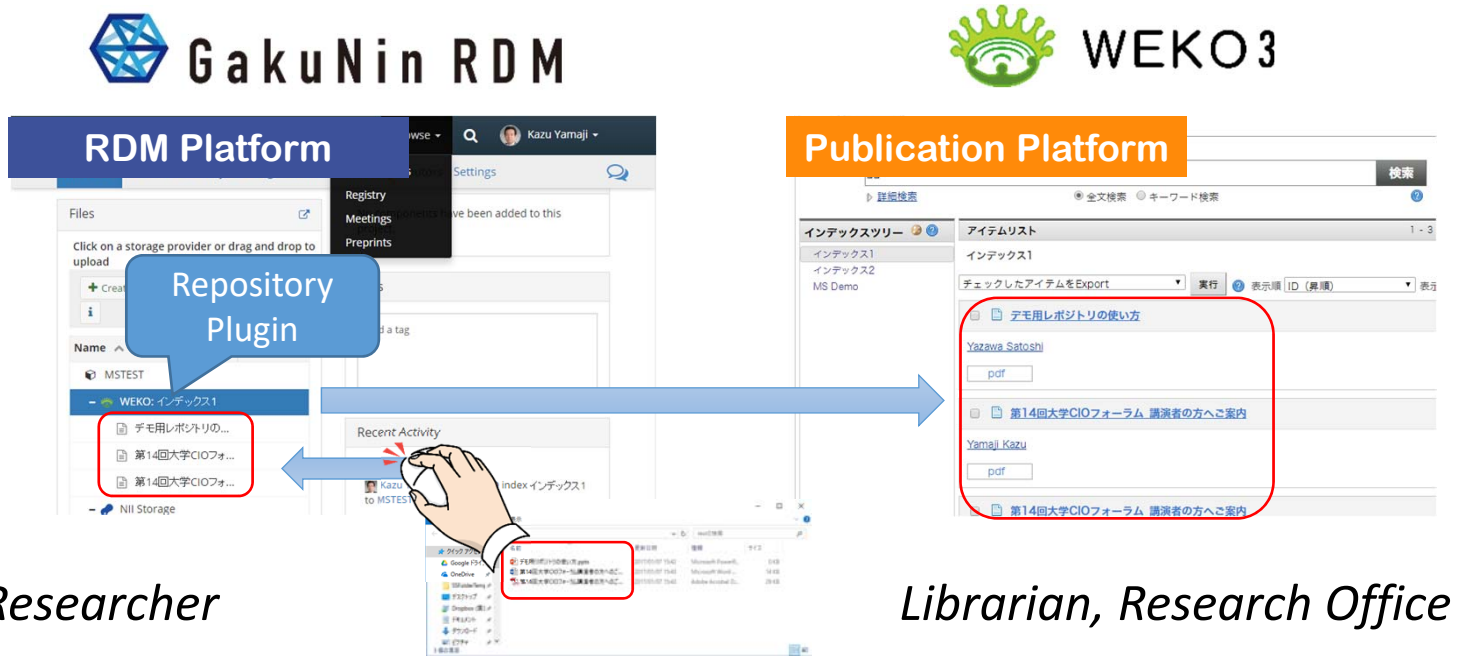
# Integration with Data Analysis Tool




（2018年12月実装）

- GakuNin RDM add-on for Data Analysis Tool: JupyterHub
- Easy to Data Transfer between GakuNin RDM and JupyterHub
- GakuNin ID Federation allow uses Single Sign On between Systems

# Integration with Publication Platform



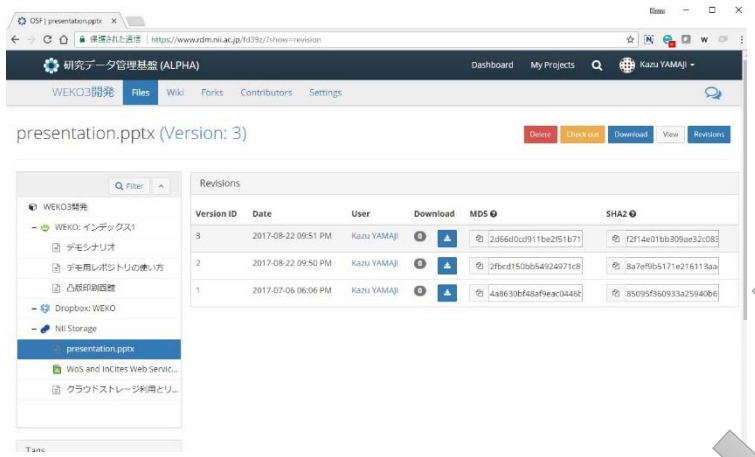

*Researcher*

- File Management
- Timestamp Proofing
- Long-term Preservation
- …

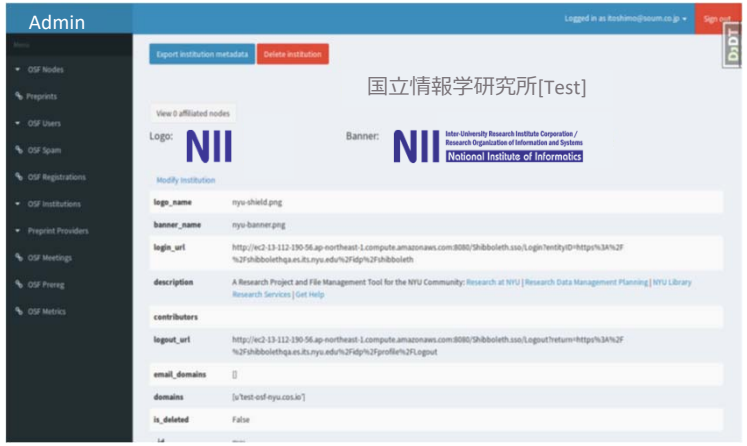
*Librarian, Research Office*

- Metadata Management
- Data Publication
- DOI Registration
- …

# Research Footprint Management




Time Stamping Authority

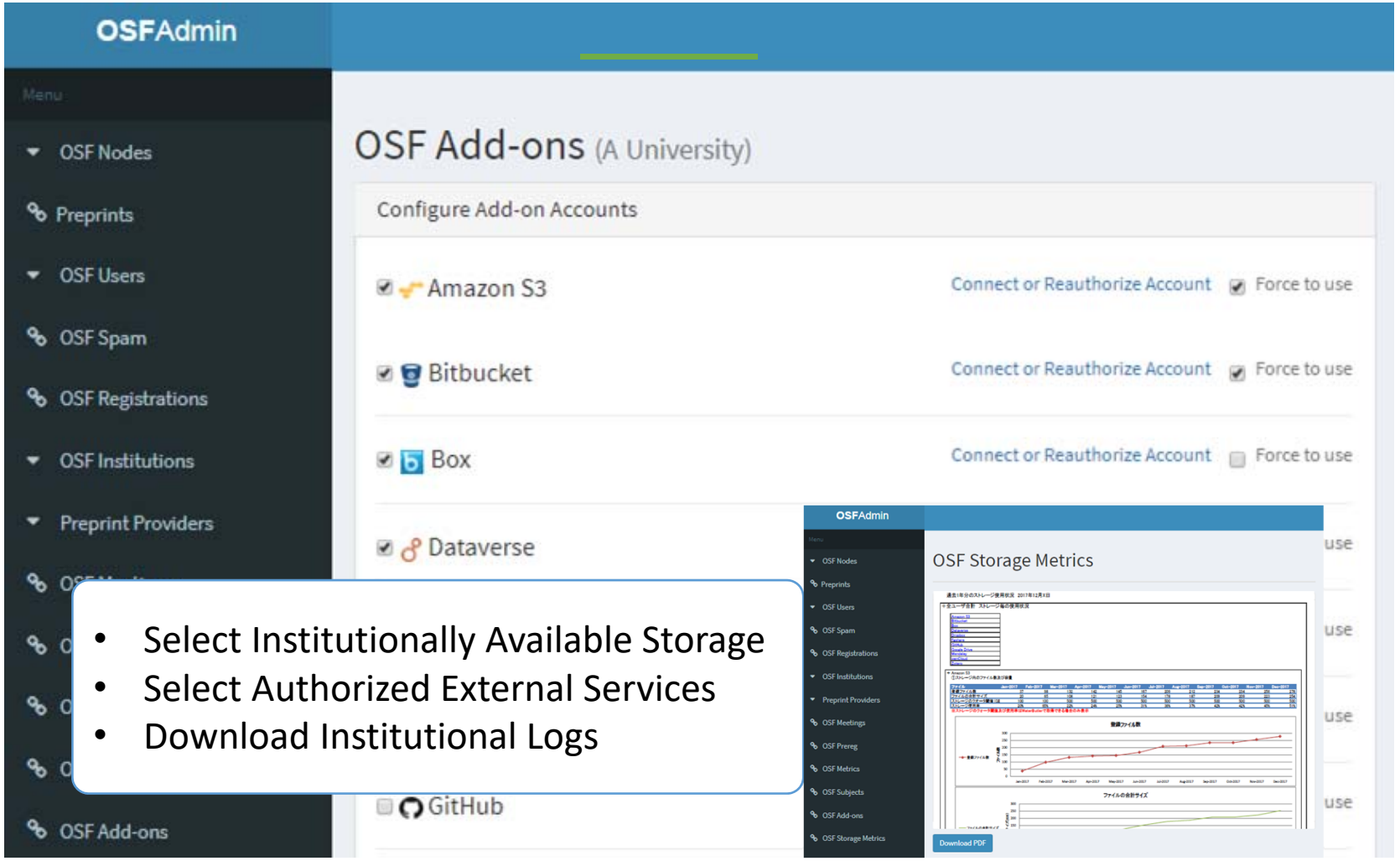



Project Log

Institutional Log

RDM Platform

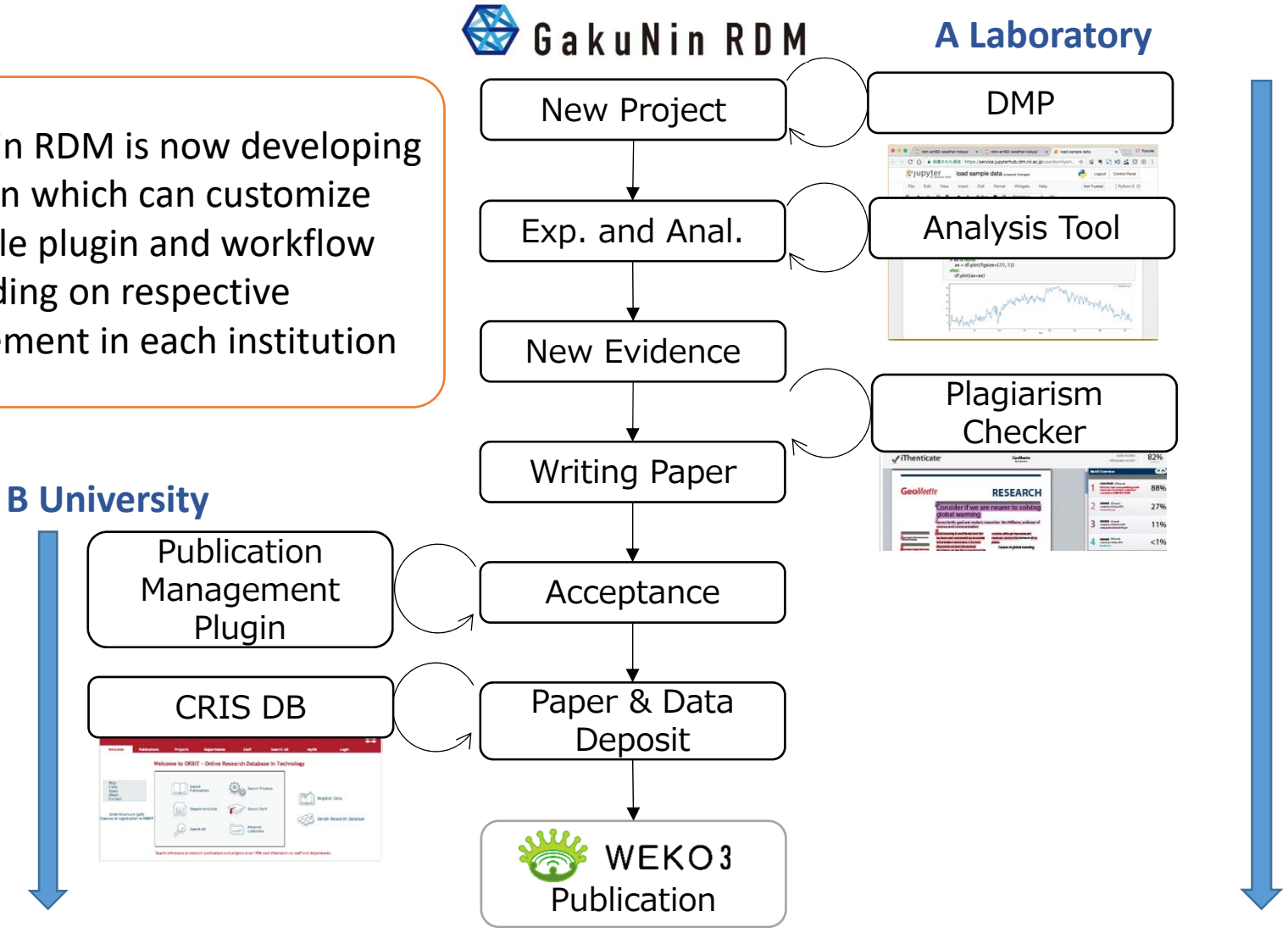
# Institutional Management Function




- Select Institutionally Available Storage
- Select Authorized External Services
- Download Institutional Logs

# Use Case of GakuNin RDM in Institution

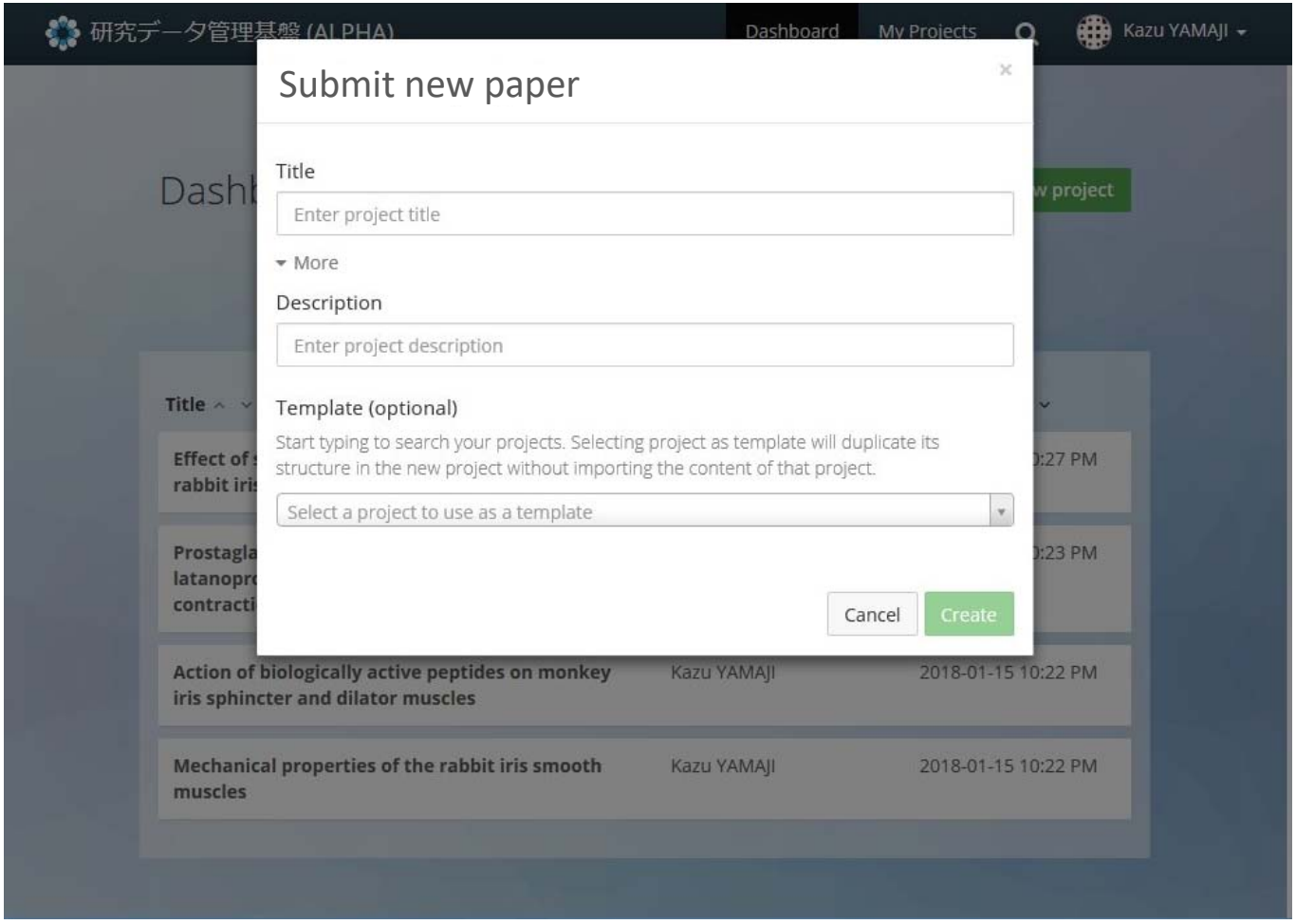
GakuNin RDM is now developing function which can customize available plugin and workflow depending on respective requirement in each institution



RDM Platform

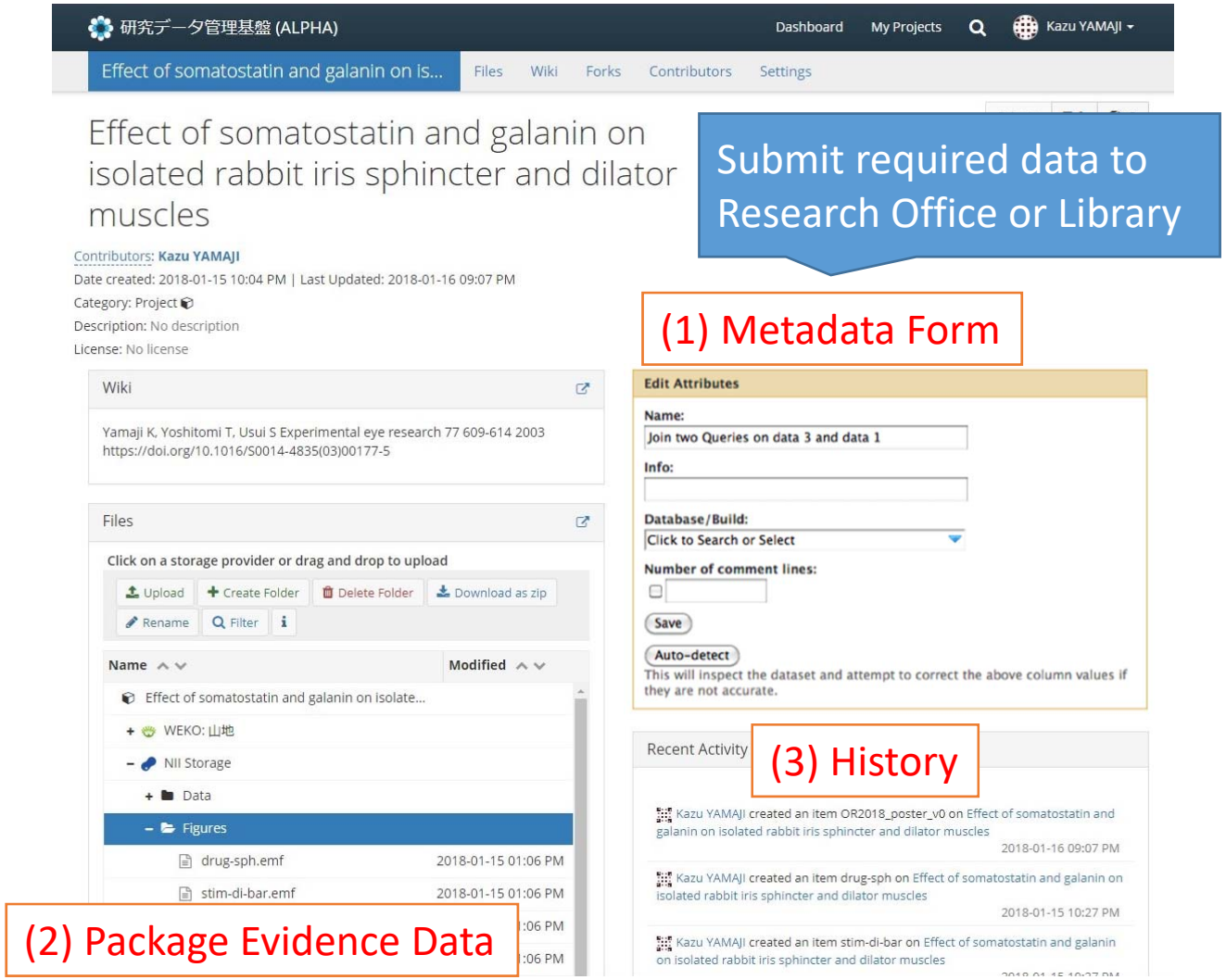
# Paper Submission and Research Data

## Reporting to Research Integrity Office



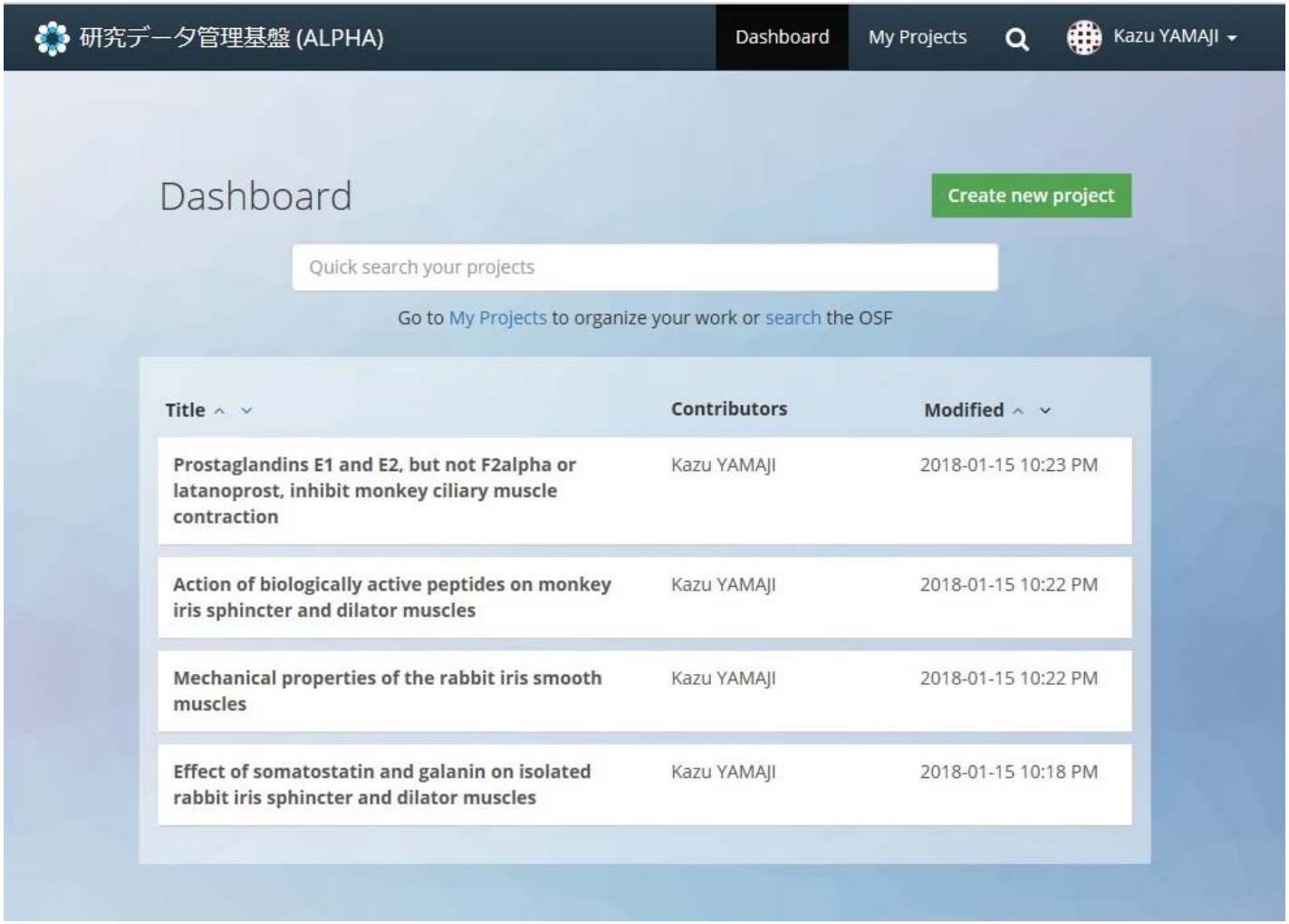
RDM Platform

# Use GakuNin RDM as a Submission Form



RDM Platform

# List of Submission



# 2 RDM Charter for acad. institutions

# Why an RDM Charter?

- Participants at AXIES-RDM session started to claim,
  - *"We need a charter in order to convince the university administration and to get the researchers and staff engaged!"*

✓ AXIES

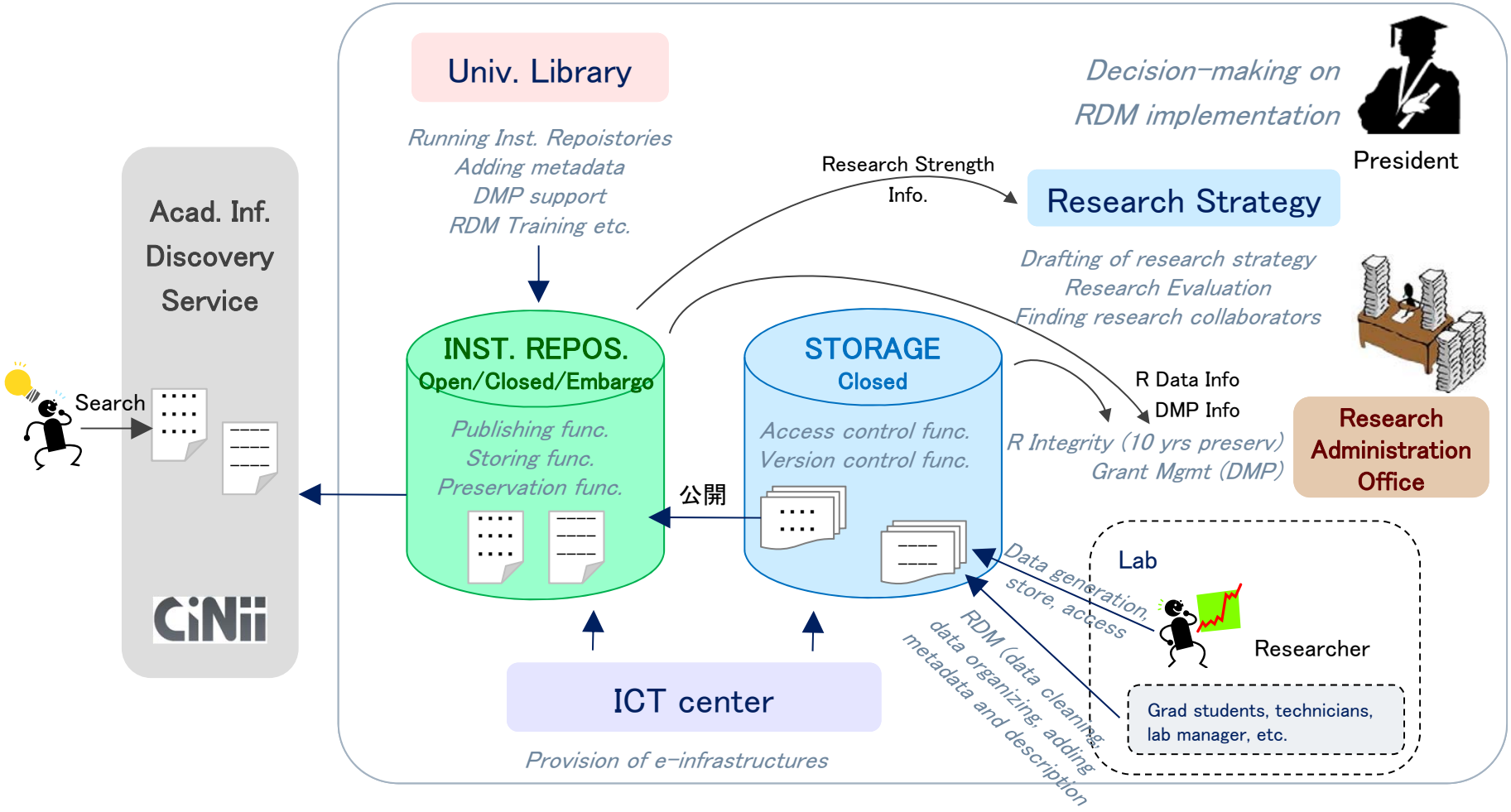
- Academic eXchange for Information Environment and Strategy
- Community of CIOs and ICT centers of universities in Japan.
- Counterpart to EDUCAUSE in the US

# “RDM Charter for Academic Institutions”

- RDM Charter
  - Not for researchers, but
  - For academic institutions!


- Purpose of RDM Charter
  - Give university administration ideas and options to implement RDM in respective institutions.

# RDM implementation in an academic institute



# “RDM Charter for Academic Institutions” …Composition

- The Charter (3 pages)
  - Addresses the viewpoints why academic institutions needs to take RDM seriously.
  - Viewpoints in bullet points:
    I. Role of academic institutions in RDM
    II. Policies and organizations for RDM needed in acad. Institutions
    III. RDM procedures in acad. Institutions
    IV. RDM Purpose options in acad. Institutions
    V. Digital platform functions needed for RDM in acad. Institutions
    VI. Human resources development for RDM in acad. Institutions
    VII. Reuse and service options of research data in acad. institutions
- Appendix (12 pages)
- Glossary (12 terms, 3 pages)
- References (2 pages)

# Various RDM implementing purposes in an academic institution

- Competitiveness
  1. Raising visibility of acad. Institution
  2. Attracting top researchers and collaborators
  3. Research evaluation within the institution
- Accountability and Compliance
  4. Complying to funding agencies' mandates
  5. Complying to scientific misconduct guideline
- Outreach and Education
  7. Outreach to industries and society in general
  8. Provide education and training for data-intensive work

# Schedules for RDM Charter for Academic Institutions

1. Drafting stage: NOW!
2. Announcement of draft
   - Announcement at AXIES-RDM session, annual meeting (Nov. 21, 2018)
3. Accepting public comments
   - Nov. 2018 – Feb. 2019
   - Refinement
4. Approval at AXIES
   - General Assembly in spring 2019

*Possible next steps*

- Drafting action plans for various RDM purposes

# 3 RDM Guideline at acad. institutions

# Project with universities on how to implement RDM in acad. institutions

- Project members
  - The University of Tokyo
  - Kyoto University
  - Nagoya University
  - Chiba University
  - Shinshu University
  - Toyohashi Institute of Technology
  - National Institute of Informatics (NII)

University administrator, ICT center staff, librarians, etc.

- Grant
  - “Future Investment Grant Program” by Research Organization of Information and Systems (ROIS)
  - 2018 Feasibility Study
  - If positively evaluated, proceed to real project in 2019-2020.

# Possible schedules and outputs of ROIS grant project on RDM implementation

- F.Y. 2018 Feasibility Study
  - Consultation with member universities
  - Possibly drafting "Issues to be addressed in implementing RDM at acad. Institutions"
- F.Y. 2019-2020 Drafting Guideline
  - Organizing WGs and pilot projects at member universities
  - Possibly drafting as output.
    1. Case Study: Implementing RDM at academic institutions
    2. Guideline: How to implement RDM at academic institutions
- F.Y. 2020 System Development

3

# Quo Vadis?

## Open Science in Japan

# Open Science Landscape in Japan

- Open Science in Japan mainly driven by policymakers and infrastructural work.
- Even though trying to raise awareness for Open Science, history shows that making it far is difficult.
- However, Japan is a country where central efforts are adopted without hesitations.
- As such, many institutions will adopt NII Research Data Cloud.

# NII Research Data Cloud leading the Future of Open Science in Japan

- NII Research Data Cloud aims to be the daily workstation for researchers.
- It aims to manage research data without having researchers realizing it.
- If introduced properly, NII Research Data Cloud will form the basis of RDM in Japan.

*We hope to transform Japanese acad. institutions fit for the digital era!*

# Another Galápagos syndrome in Japan?