

The Experimental Project of DOI Registration for Research Data at Japan Link Center (JaLC)

Hideaki Takeda

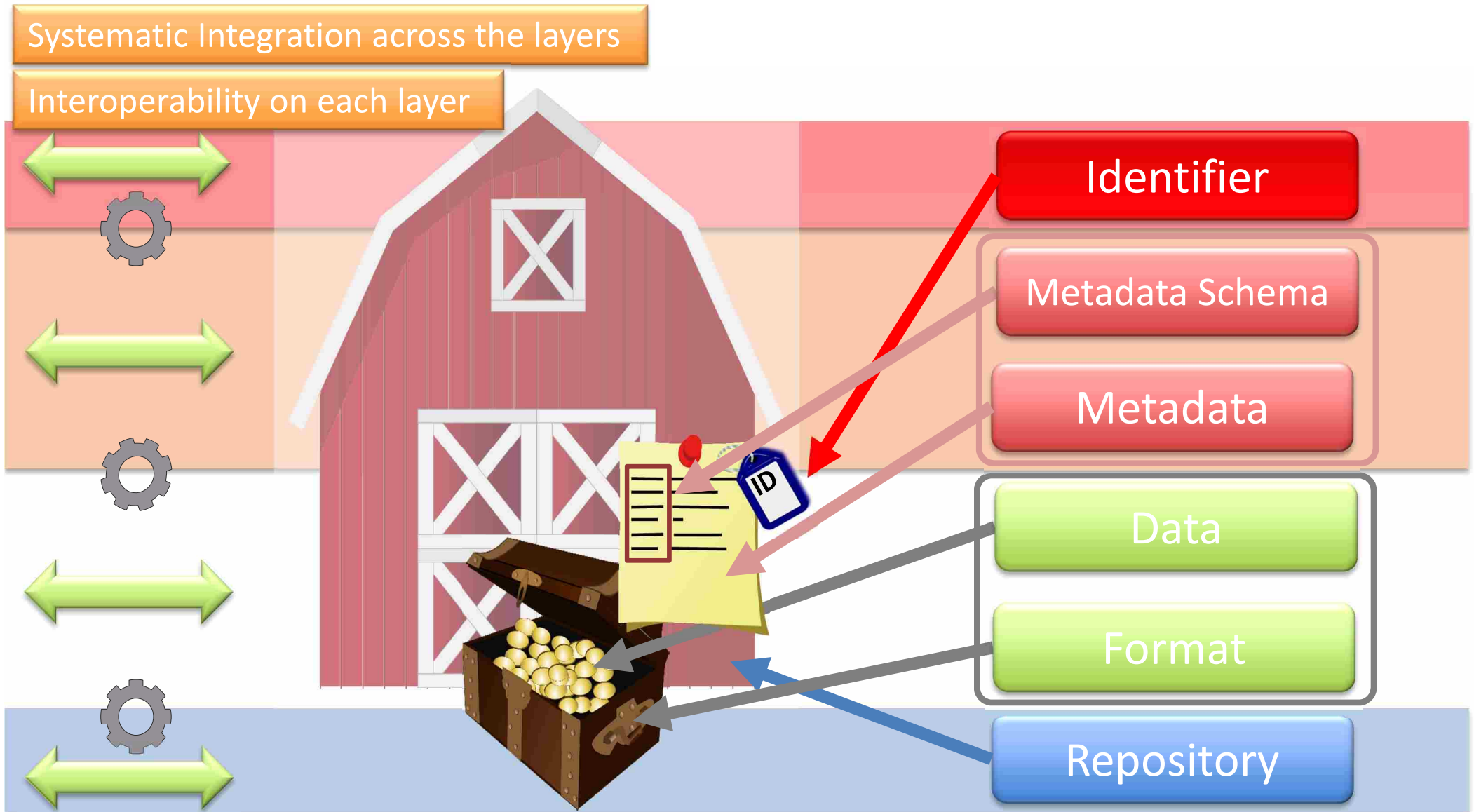
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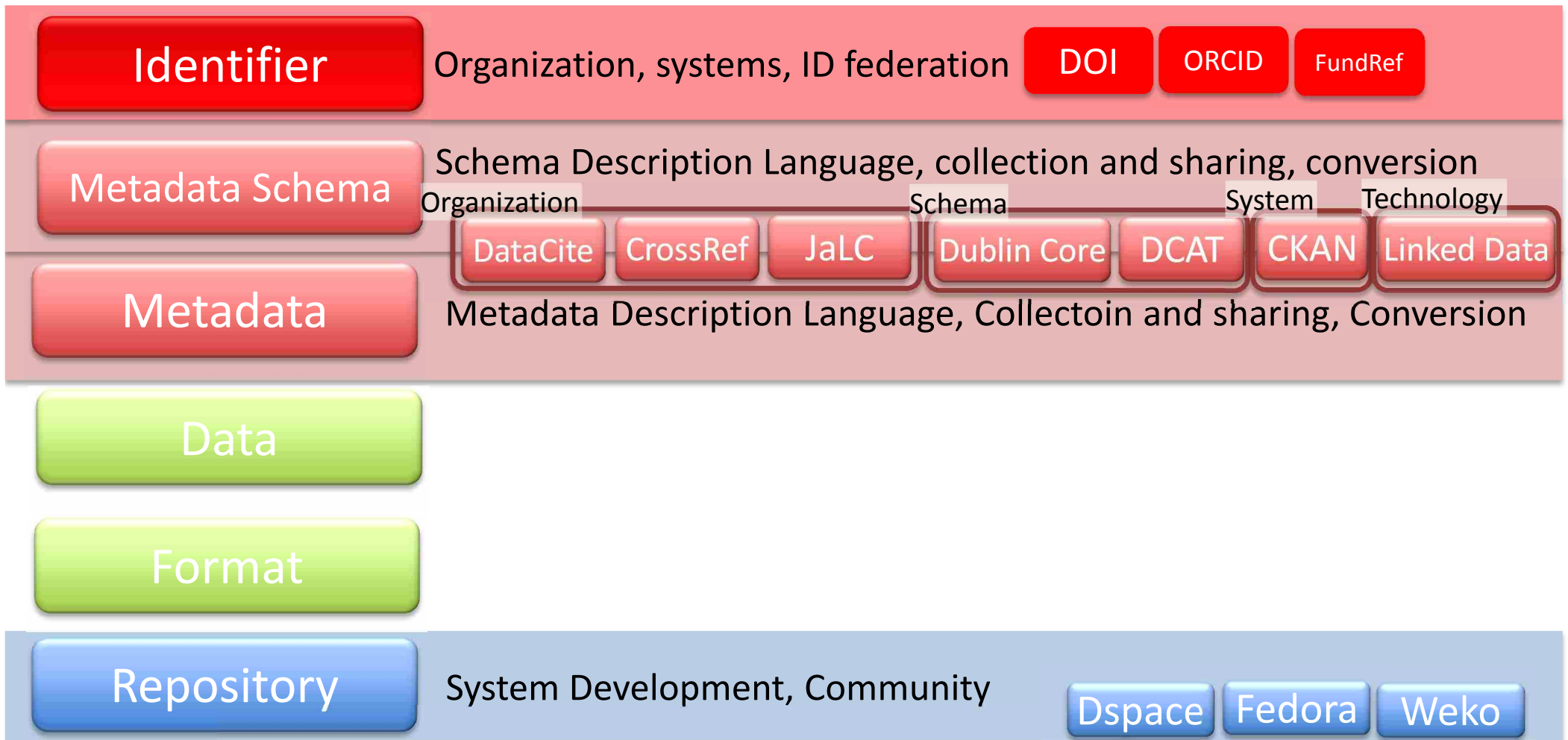
ORCID: 0000-0002-2909-7163



Architecture of data sharing



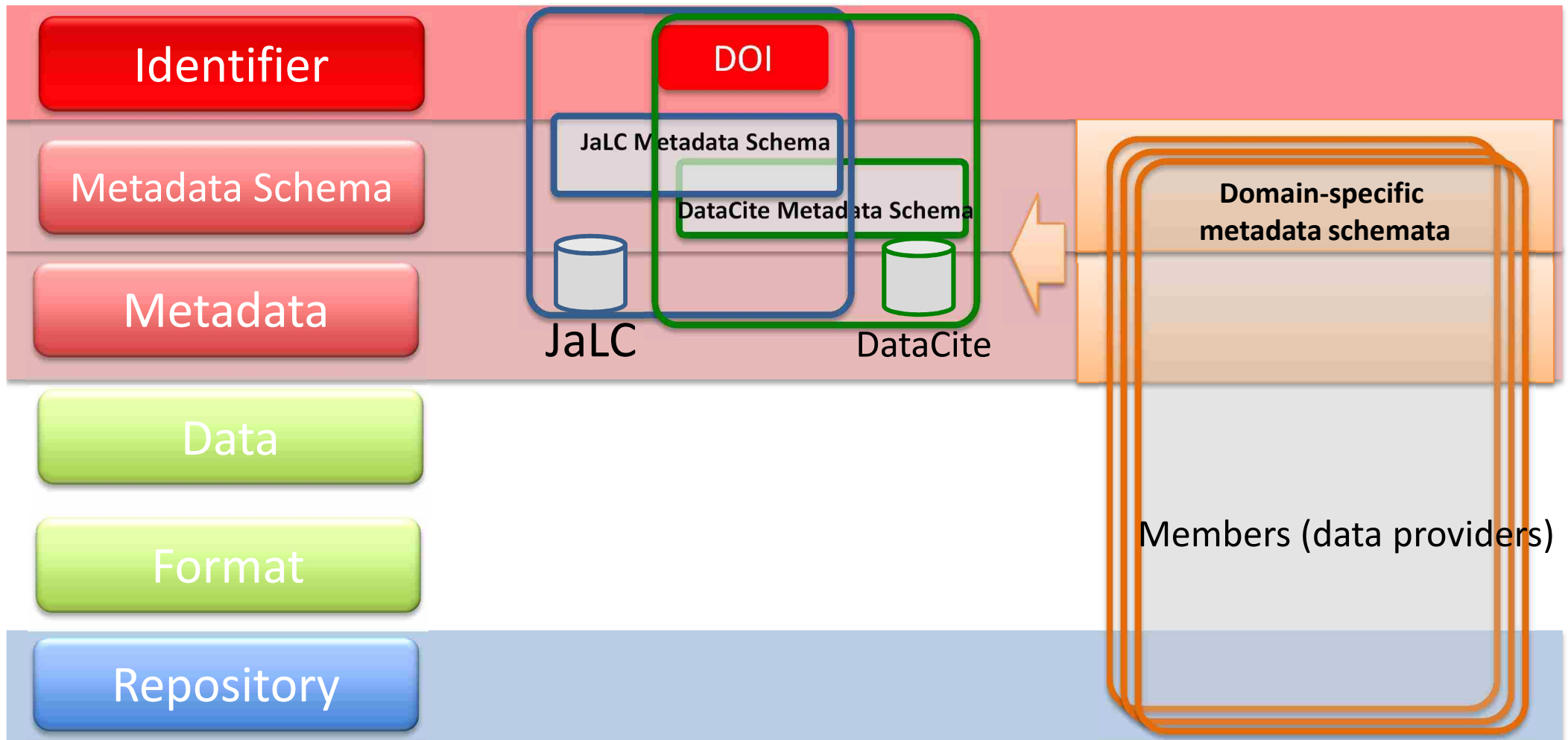
Architecture of data sharing



Coordination and Competition

DOI

DOI in Architecture of Data Sharing

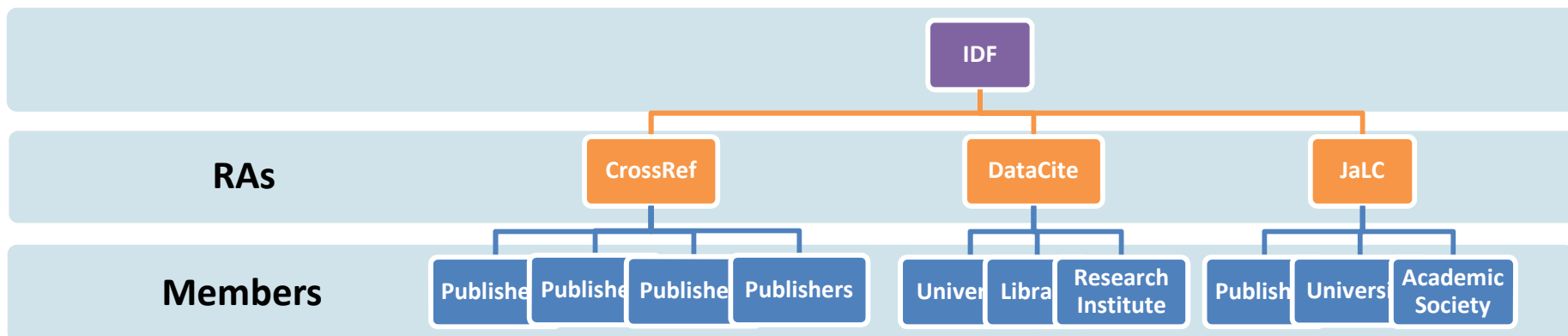


DOI (Digital Object Identifier)

- Service to translate DOI names to URIs containing digital objects
- Service managed by International DOI Foundation (IDF)
- Initially started by STM publishers to share identifiers for digital publications
- Distributed management
 - Delegation of registration tasks to Registration Agencies (RAs)

Management Structure of DOI

- There Layers: International DOI Foundation (IDF), Registration Agency (RA), members
- RAs contributes to IDF by registration to Registry DBs, management of Registry DBs, and members fees
- RAs offers services for DOI registration to their members
- Members can register DOIs to their digital objects through RAs




Roles of DOI

- Provide resolvable, persistent, interoperable links
 - Resolvable: standard syntax + mapping by handle system
 - Persistent
 - Technically: management of registry DBs
 - Socially: organizational operations and duties for members
 - Interoperability: sharing datamodel

Registration Agencies (RAs)

 <p>airiti DOI</p>			
<p>Airiti, Inc.</p>	<p>CrossRef</p>	<p>EIDR (Entertainment Identifier Registry)</p>	<p>ISTIC (The Institute of Scientific and Technical Information of China)</p>
			
<p>China National Knowledge Infrastructure (CNKI)</p>	<p>DataCite</p>	<p>JaLC (Japan Link Center)</p>	<p>mEDRA (Multilingual European DOI Registration Agency)</p>


<p>OP (Publications Office of the European Union)</p>

Japan Link Center (JaLC)

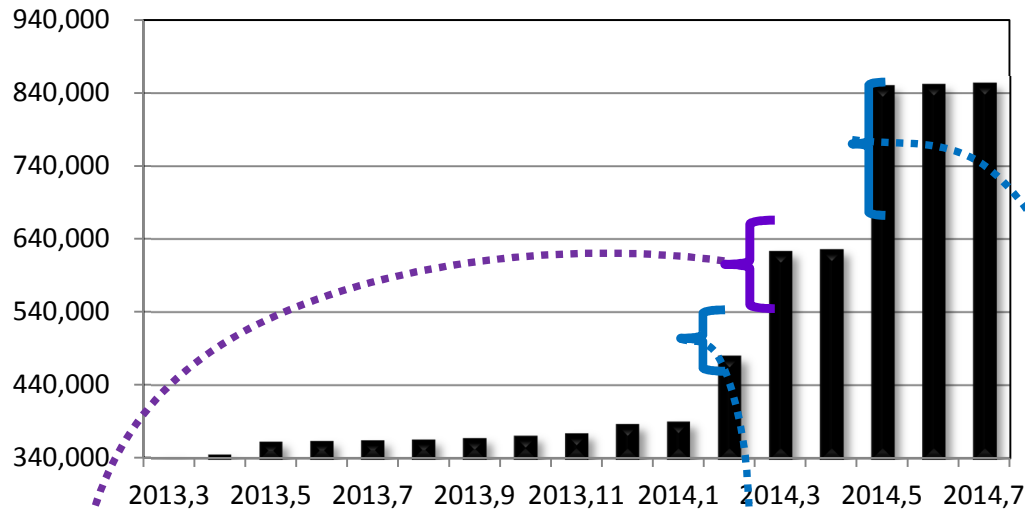
- Founded in March 2012
- Aimed to register DOIs for academic contents produced in Japan or in Japanese, to circulate information in Japan and overseas.
- Controlled by four national organizations:
 - Japan Science and Technology Agency (JST)
 - National Institute for Materials Science (NIMS)
 - National Institute of Informatics (NII)
 - National Diet Library (NDL)
- Operated by JST
- Membership system (Academic societies, Publishers, University libraries, etc)
 - 24 Members, 950 Associate members
- External coordination

JaLC is a member of CrossRef and DataCite(Mar. 2014)

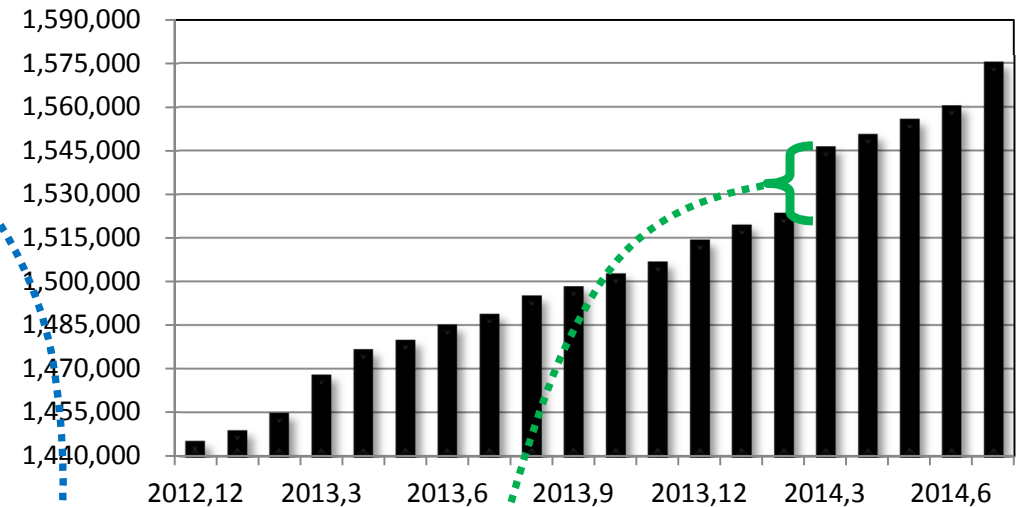
Over 1,300,000 DOI registered

Number of DOIs

JaLC DOI



CrossRef DOI (via JaLC)



※ J-STAGE Article : 90,000+ + 200,000 (JaLC DOI)

+ 20,000 (CrossRef DOI)

(Collective registration for the articles which had not been registered DOI)

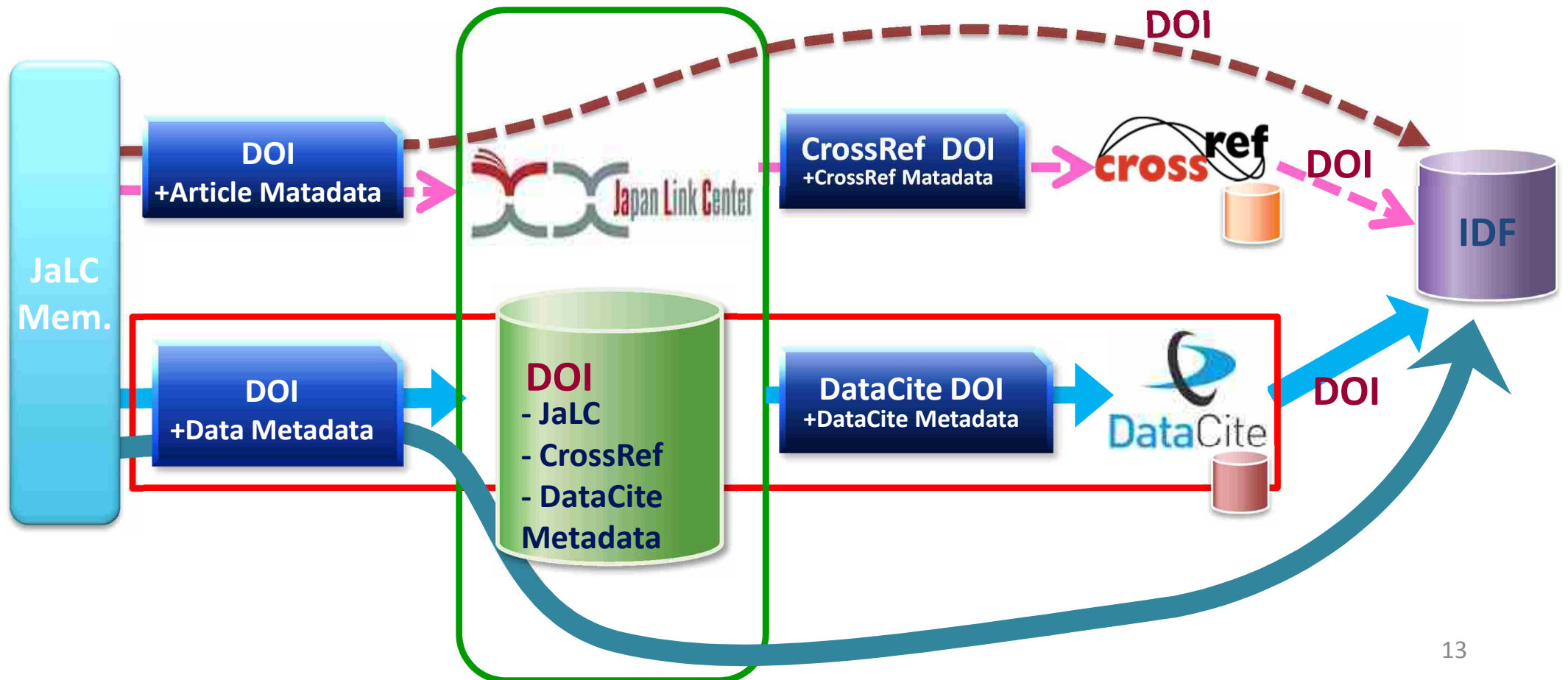
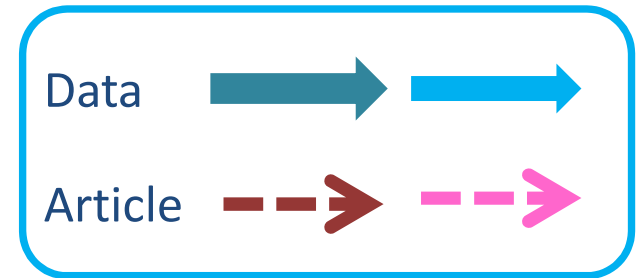
※ National Diet Library's Doctoral Thesis : 140,000

Total amount of DOIs: 2,427,391 (at the end of July 2014)

Content categories

Category	
Journal articles	
Journal articles	Dec.2012 -
University bulletins	Sep.2014 -
Conference proceedings	Mar.2012 -
Books	
Books	Jan.2015 -
Doctoral theses	Mar.2014 -
Reports	
Technical reports	Jan.2015 -
Governmental reports	Jan.2015 -
Research data	Jan.2015 -
e-learning resources	Jan.2015 -

DOI Registration Flow



Metadata Schemata

No	Contents type	Additional Metadata	External Deposit
1	Journal Article	journal name, ISSN, volume, number, title, page, etc.	CrossRef
2	Book	series title, chapter , ISBN, etc.	CrossRef
3	Research Data	size, geolocation, rights, signature, etc.	DataCite
4	E-learning	Learning Resource type, rights, etc.	
5	Other	(Basic metadata only)	

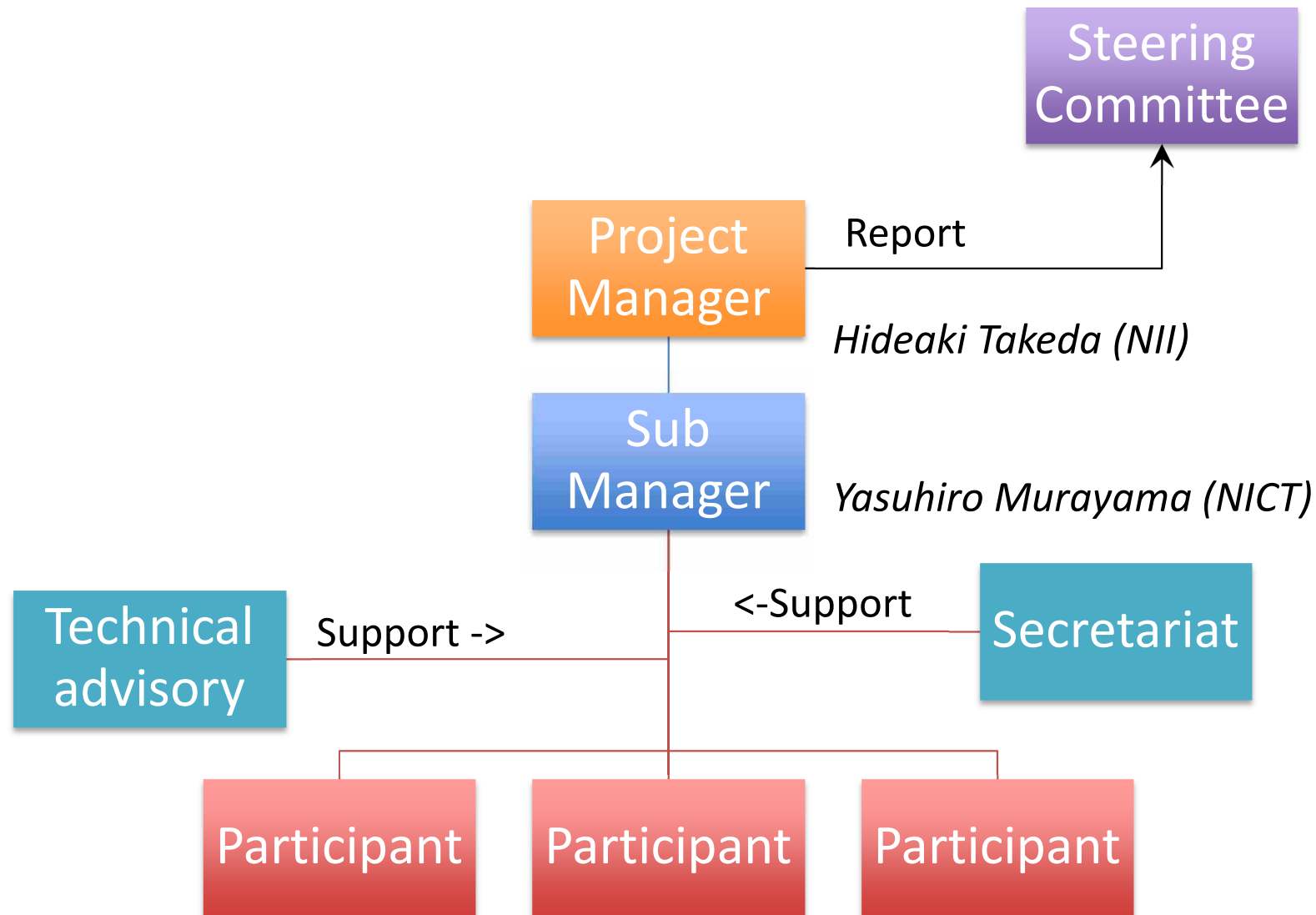
Basic metadata:

DOI, URL, title, author information, affiliation, researcher id, publication date, publisher, edition, related contents, funder

The Experimental Project of DOI Registration for Research Data

- Goal
 - Establish operation flows to register DOIs for research data
- Objectives
 - Set policies in registering DOIs for research data
 - Establish operation flows to register DOIs for research data with JaLC system.
 - Test Data DOI registrations
- October 2014 – October 2015

Project Organization



Participants are supposed to be research institutes, universities, etc. and chosen by public invitation.

Members of the project



National Institute of Information and Communications Technology



宇宙航空研究開発機構
Japan Aerospace Exploration Agency

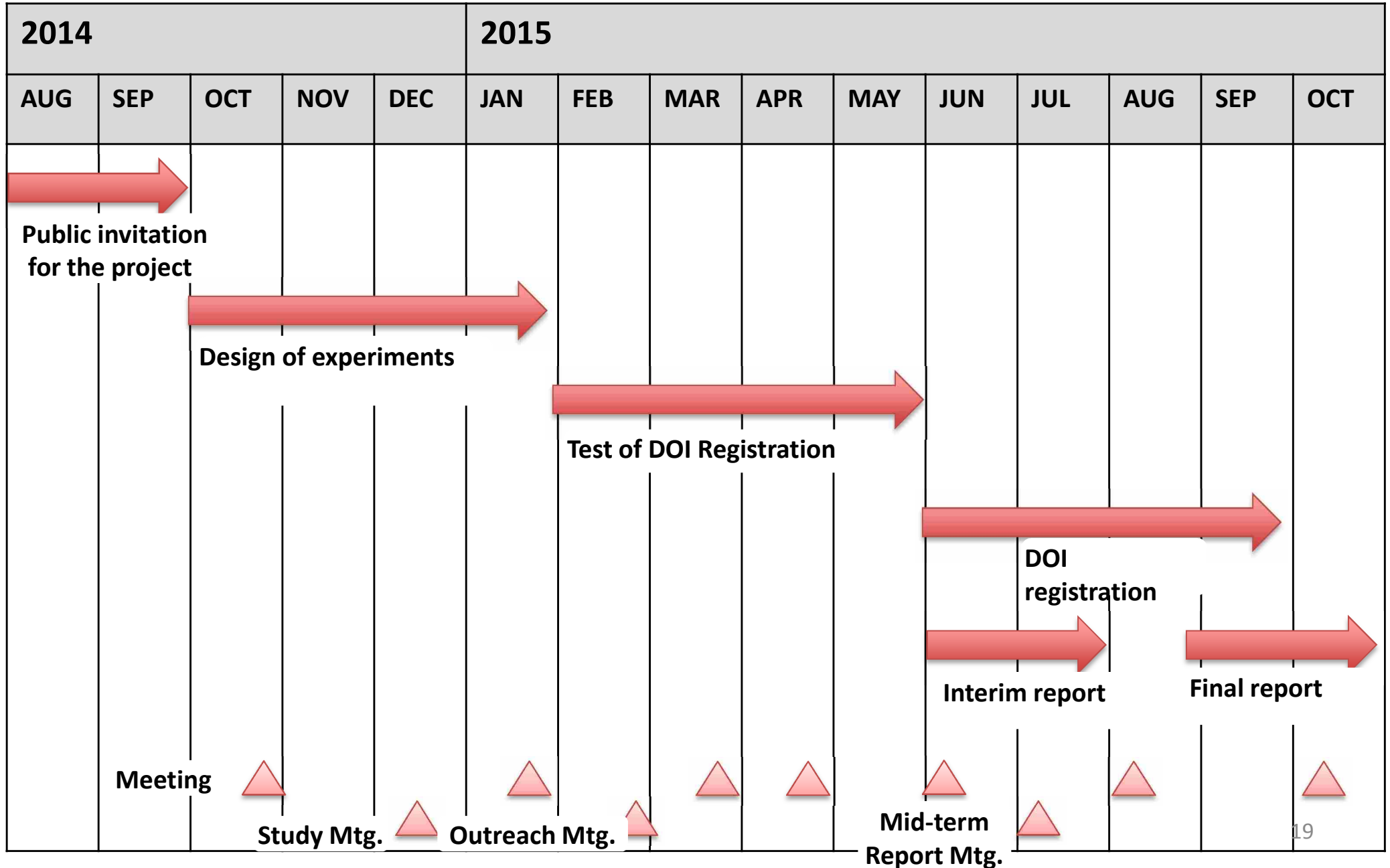


9 projects with 14 organizations

Members of the project

- National Bioscience Database Center (NBDC), Japan Science and Technology Agency (JST)
- National Institute of Polar Research (NIPR)
- National Institute of Informatics (NII)
- DIAS-P Project (National Institute of Informatics (NII))
 - Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
 - University of Tokyo
 - Kyoto University
 - National Institute for Environmental Studies (NIES)
- National Institute of Advanced Industrial Science and Technology (AIST)
- National Institute of Information and Communications Technology (NICT)
 - Kyoto University
 - National Institute of Informatics (NII)
 - InfoProto Co.,Ltd.
 - Japan Aerospace Exploration Agency (JAXA)
 - National Institute of Polar Research (NIPR)
- Chiba University Library
- National Institute for Materials Science (NIMS)
- Neuroinformatics Japan Center, Brain Science Institute (BSI), RIKEN

Schedule



Results

- Practice of DOI Registration by Project members
 - System Integration
 - Registration via API from the institutional systems
 - Practical Use
 - Experimental (to be removed)
 - Trial (to be maintained)
- Documentations
 - Guideline for Research Data DOI Registration
 - Project Report

Horizontal wind velocity in the altitude range of approx. 60-90 km is observed with Poker Flat MF (medium frequency) radar, using the radar wave at 2.43 MHz. The radar receives weak radio echo signals returned from the weakly ionized atmosphere (ionospheric D-region) at the target altitudes, to deduce horizontal air motions (Murayama, Y., K. Igarashi, D. D. Rice, B. J. Watkins, R. L. Collins, K. Mizutani, Y. Saito, and S. Kainuma, Medium Frequency Radars in Japan and Alaska for Upper Atmosphere Observations, IEICE Trans., E83-B, pp.1996-2003, 2000). Poker Flat MF radar has been constructed as part of Japan-US joint research program of Arctic middle & upper atmosphere ("Alaska Project") in collaboration between National Institute of Information and Communications Technology, Japan (formerly Communications Research Laboratory), and Geophysical Institute, University of Alaska Fairbanks.

Data Citation

Citation: Alaska Project of NICT (CRL)-GI/UAF, Mesospheric wind velocity data (30min. mean) observed with MF radar at Poker Flat, Alaska, doi:10.17591/55838dbd6c0ad

General Characteristics

Parameters: Mesospheric horizontal wind velocity

Processing
level:

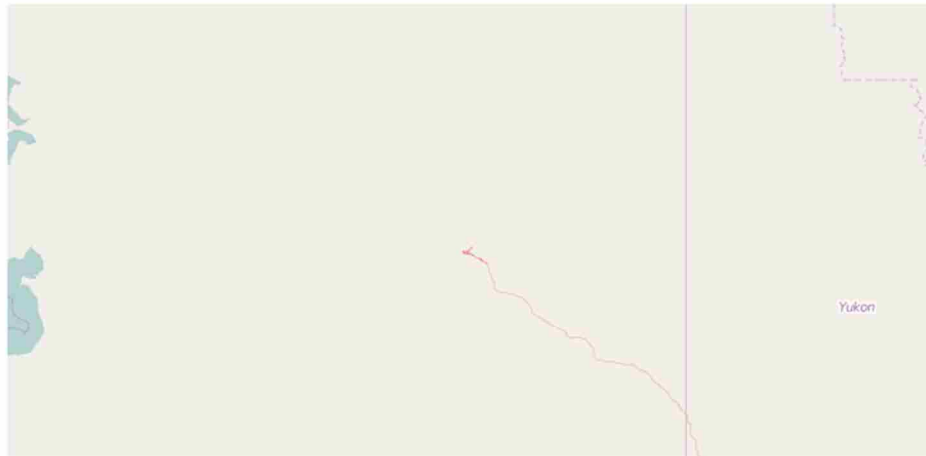
Latitude: 65.1

Longitude: -147.5

Temporal 30 minutes
resolution:

Start date: 1998-10-16T01:45:00

Stop date: -PT1D



Links

Data <http://salmon.nict.go.jp/>

Access: (Temporarily closed; please contact [murayama\(at\)nict.go.jp](mailto:murayama(at)nict.go.jp) for data access if the web site is not available.)

DOI: [10.17591/55838dbd6c0ad](https://doi.org/10.17591/55838dbd6c0ad)
Digital Object Identifier

Citing data: <http://ghrc.nsstc.nasa.gov/uso/citation.html>
Instructions for citing data.

Provider Version

1.0

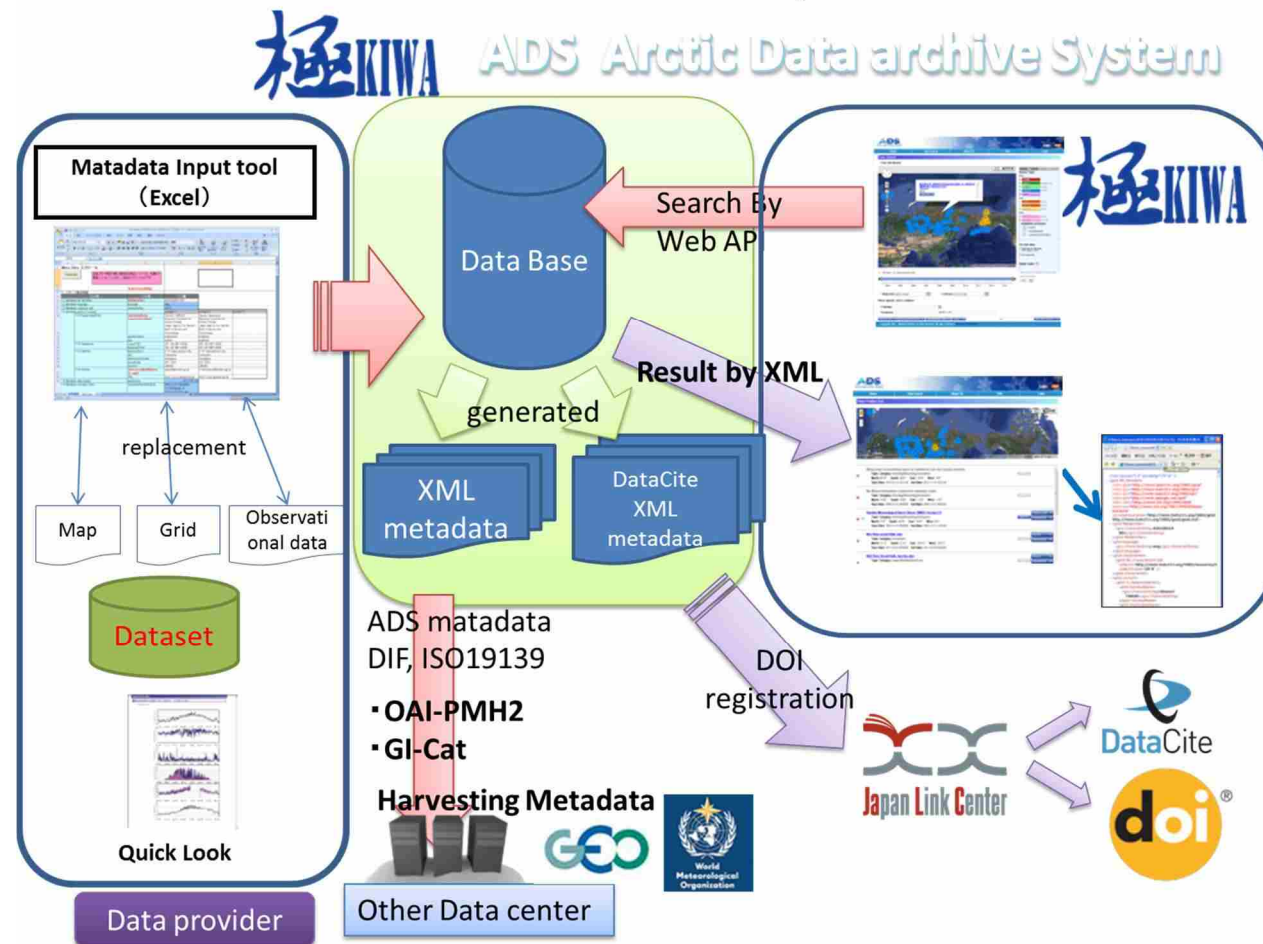
Update History

[2015-06-19T13:10:39+0900](#)

[2015-06-19T12:55:24+0900](#)

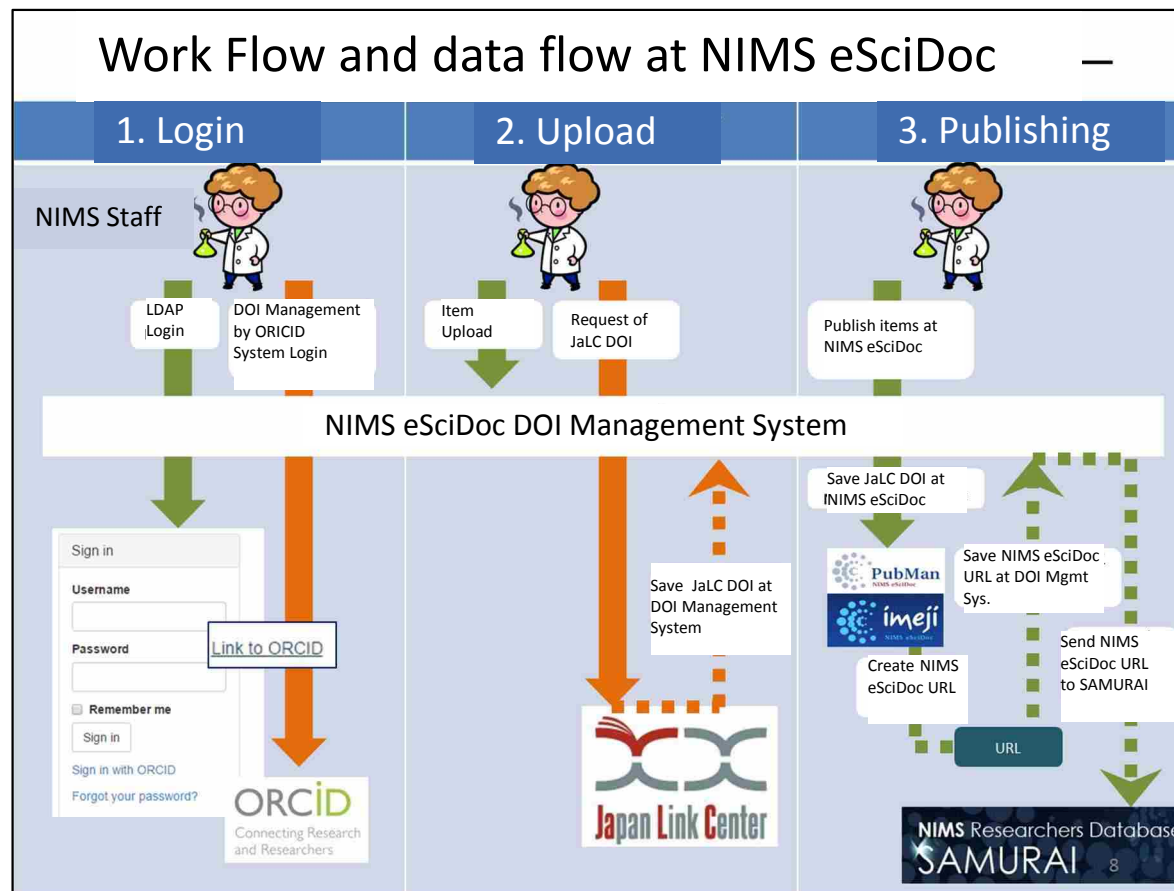
System Integration

- National Institute of Polar Research with Arctic Data archive System



System Integration

- National Institute for Material Science (NIMS)
 - with NIMS eSciDoc



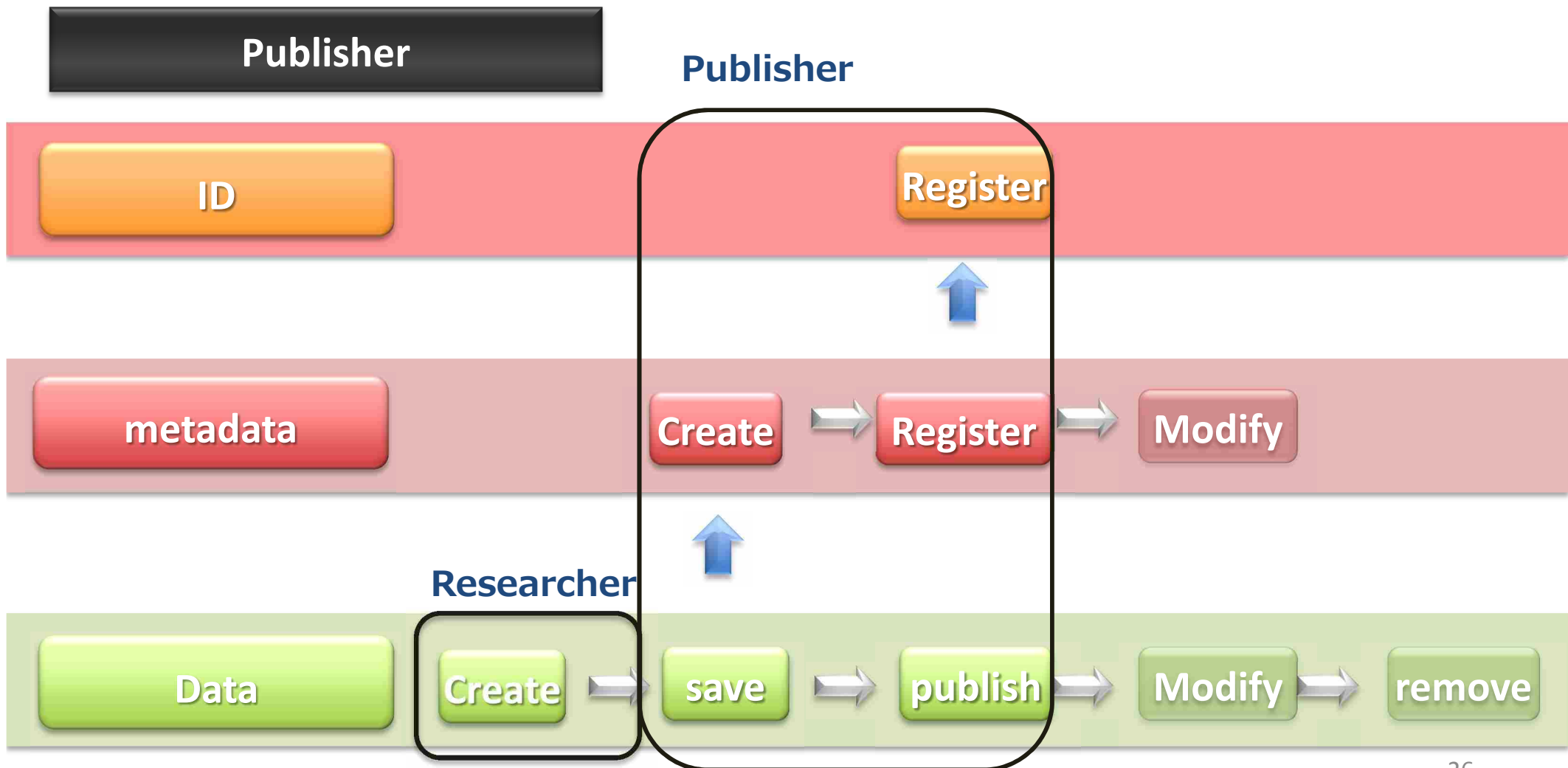
Issues in Data DOI

- Flow of operations
- Persistent access
- Granularity of data in registration
- Dynamics of data
- Landing page
- Quantity of data
- Applications

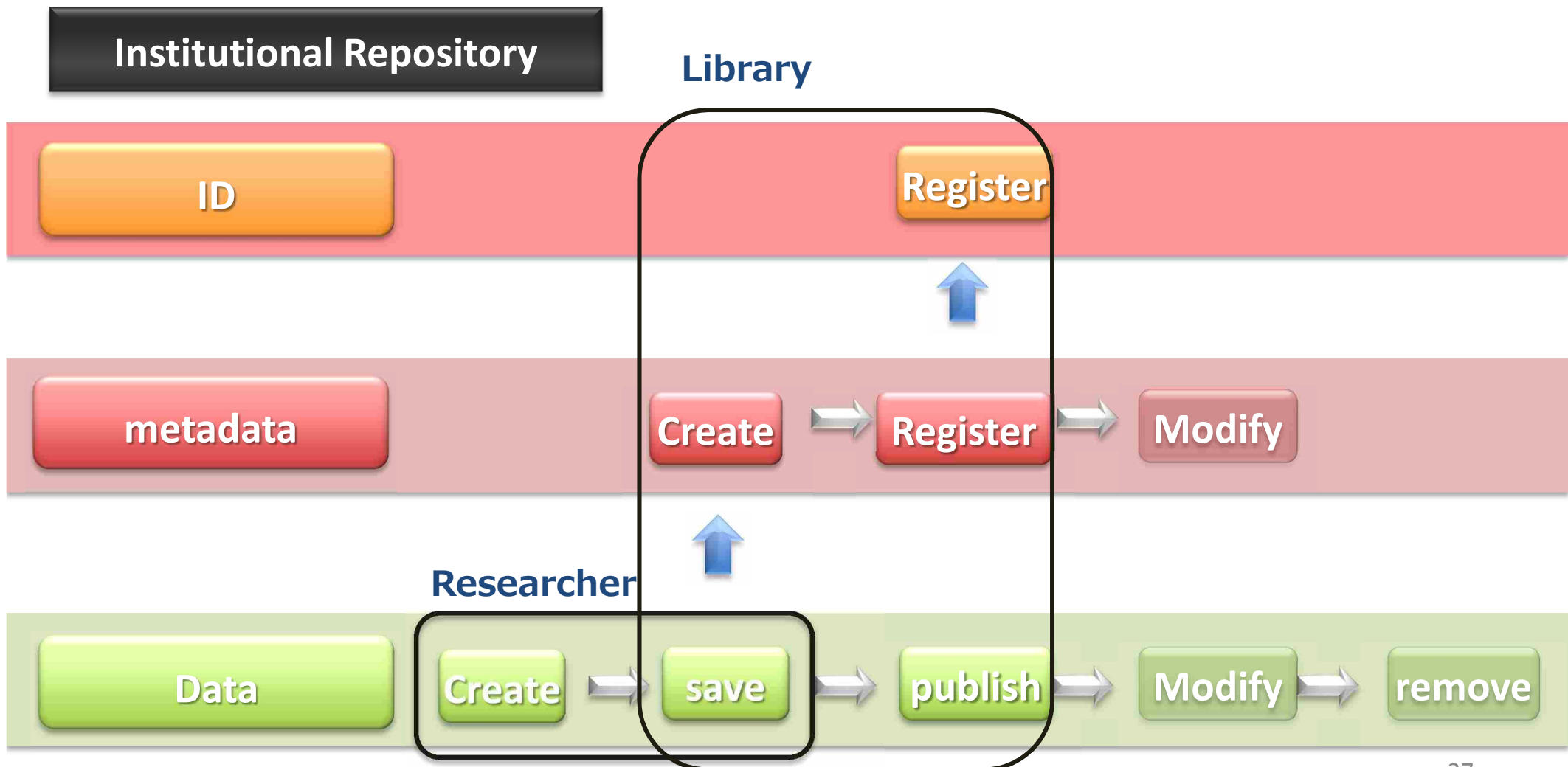
Issues in Data DOI

- Flow of operations: Who, When, How
 - Who registers data?: Researcher/Project manager/Librarian
 - When is data registered?
 - How is metadata provided for data?
 - Persistent access
 - What persistency can we expect for data?
 - Can time-limited projects participate? Who will ensure the persistency of the data?
- (ex.)
- ✓ The representative institute takes over all of the data
 - ✓ Registering DOIs only for data managed by real organizations among the members of the project

Life cycle of data and stakeholders - in case of publisher -

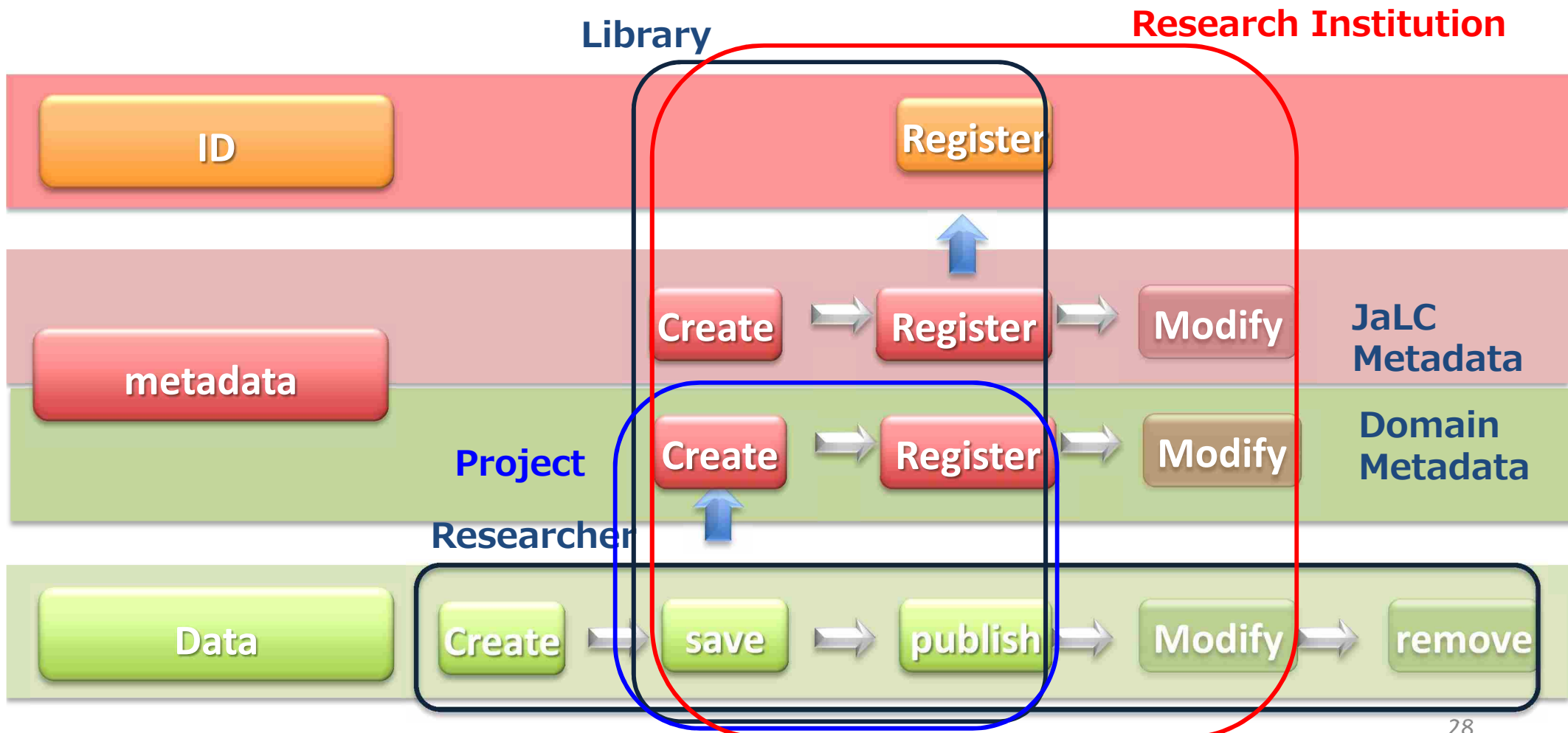


Life cycle of data and stakeholders - in case of university library -



Life cycle of data and stakeholders

- in case of research data -



Issues in Data DOI

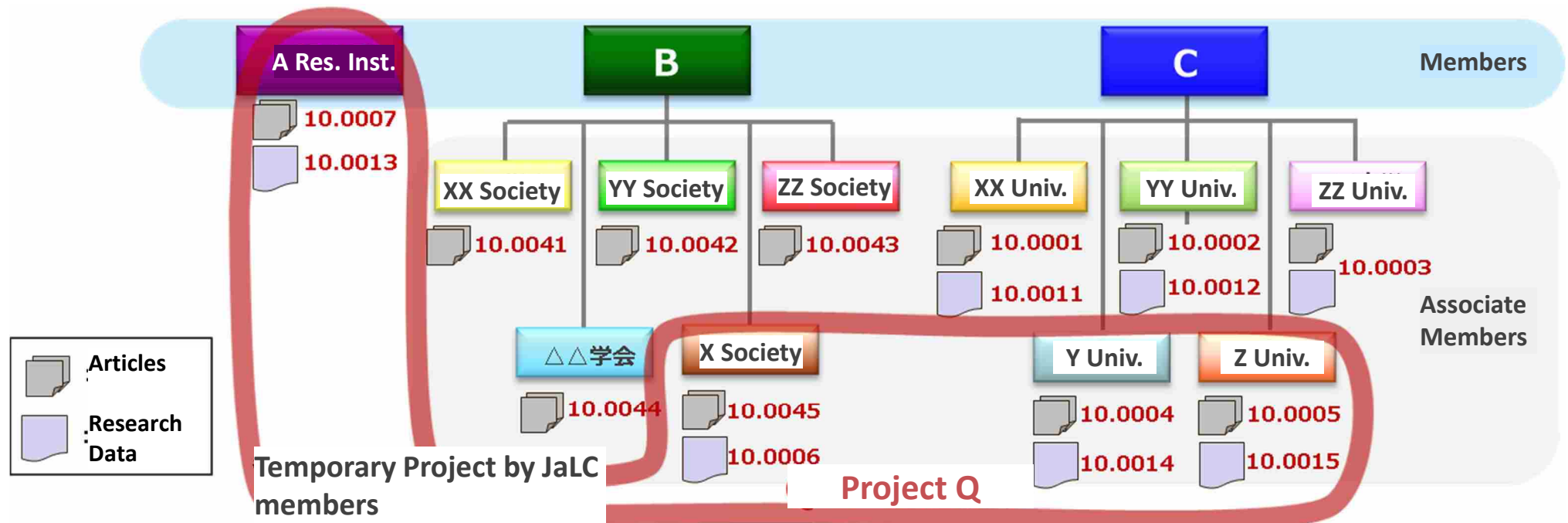
- Persistent access
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(ex.)

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Projects and Institutions

- Research project may consist on members from multiple institutes



Issues in Data DOI (cont'd)

- Granularity of data in registration
 - Some aspects for granularity of data
 - Good for citation
 - Granularity of data itself
 - Observation data/Experiment data/Simulation data
 - Easy for access
 - Easy for management
 - Quantity of data

Issues in Data DOI (cont'd)

- Dynamics of data
 - Adding data after registration of DOI
 - Some options:
 - Different DOIs
 - Add relationship metadata to denote the relation to the original DOIs
 - Use the original DOI
 - Versioning: add the link to the new data while keep the link to the original data
 - History of changes in the single DOI
 - No descriptions (e.g., data in observing)

Issues in Data DOI (cont'd)

- Landing page
 - Metadata description
 - For open/closed data
- Quantity of data
 - Registering DOI for a large amount of data
- Applications
 - Citing DOIs for research data
 - Developing other applications

Recommendations for Data DOIs

- Recognition of variety of the nature of data
- Minimal Commitment
 - Persistency, Interoperability, Usability, manageability
- Design own “DOI Registration Policy”
 - Along with Institutional “Data Management Policy”
 - Define/recommend rules of DOI registrations on these issues.

- Flow of operations
- Persistent access
- Granularity of data in registration
- Dynamics of data
- Landing page
- Quantity of data
- ...

Summary

- Data-sharing architecture
 - Interoperability should be guaranteed
 - Layers
 - ID/Metadata Schema/Metadata/Data format/Data/Repository
 - Cooperation and Competition
- DOI is the promising ID for data but different in use from one for literature
 - DOI Registration Policy is needed
- Data DOI is a good key with which various stakeholders can communicate practically to each other
 - “RDA Japan”?