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Let Us Start Research Data Management

Data-Driven Innovation Initiative, Division of Research Data Service,
Kyushu University

Library Office for DX Services, Kyushu University Library

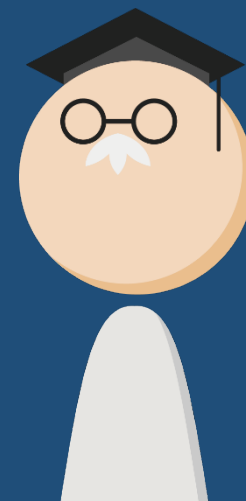
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KYUSHU UNIVERSITY

Let Us Start Research Data Management



Kyushu University, Data-Driven Innovation Initiative, Division of Research Data Service
Kyushu University Library, Library Office for DX Services
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About This Learning Material

Targets

- Graduate students and researchers who want to know about research data management
- Staff who support research data management

Overview

We will explain the basic knowledge necessary for starting research data management, such as **determining policies for research data management, research data organization methods, and the storage and publishing of research data.**

Goal

The goal is to understand the basics of research data management and be able to take the first step towards research data management.

Chapter Structure

	Theme	Number of pages	Estimated time
Chapter 1	Introduction	15	12 min
Chapter 2	Determining Research Data Management Policy	9	7 min
Chapter 3	Research Data Organization Methods	9	7 min
Chapter 4	Storage of Research Data	15	12 min
Chapter 5	Publication of Research Data	16	13 min

This learning material was originally created by modifying the following materials as part of the PTL1 course at Department of Library Science, Kyushu University in 2020.

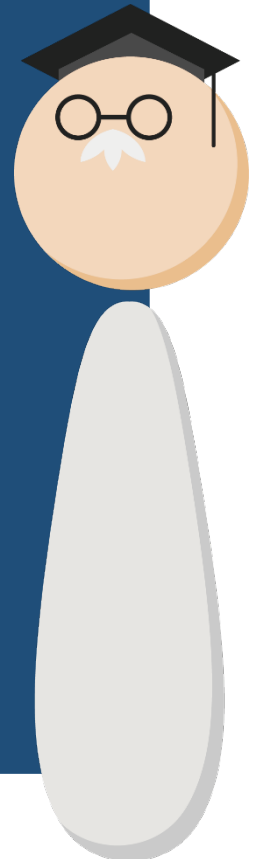
- Japan Consortium for Open Access Repositories. RDM Training Tool. 2018, <https://jpcoar.repo.nii.ac.jp/records/34>
- Japan Consortium for Open Access Repositories. Research Data Management for Researchers. 2020, <https://jpcoar.repo.nii.ac.jp/records/294>
- National Institute of Informatics. Research Data Management in the Open Science Era. 2017, <https://www.nii.ac.jp/service/jmooc/rdm/>
- Carly Strasser / translated by the Institutional Repository Promotion Committee. Research Data Management. 2016, https://jpcoar.repo.nii.ac.jp/record/372/files/NISO_Primer_RDM_jp.pdf

1. Introduction

This chapter explains the definition and benefits of research data management, the social background that led to the need for research data management, and the definition of research data.

Additionally, this learning material explains the necessary management along the research data life cycle, so the relationship between the underlying life cycle and each learning material will be explained at the end.

- 1.1 Definition and benefits of research data management
- 1.2 Social background regarding research data management
- 1.3 Definition of research data
- 1.4 Research data life cycle



Definition of “Research Data Management”

Research data management is an umbrella term covering how you organise, structure, store, and care for the digital information generated or used during a research project.

From Research Data Oxford; About data management
<https://researchdata.ox.ac.uk/about-data-management>

Benefits of Research Data Management

Appropriately managing research data has various benefits.

- **Research results**
 - Increased research efficiency
 - Time and resource savings in the long term
 - Enhancement of data security and minimization of data loss risk
 - Avoidance of duplicated efforts by other researchers re-using data
 - Simpler analysis of changes in data by providing data that allows for comparison of data from one point in time to another
- **Research ethics**
 - Establishment of research reproducibility
 - Assurance of the accuracy and reliability of research data and research records

Social Background Regarding Research Data Management

The following situations are examples of the social background that has led to demands for the management and publishing of research data.

1. Movements for promoting open science
2. National movements regarding open science
3. Measures against research misconduct
4. Compliance with research data policies

Promotion of Open Science

- What is **open science**?
 - Widespread general public disclosure of research results, such as articles and research data as evidence, leading to the creation of innovation
 - "Concept that includes **open access** and **open data**" *1
- Benefits
 - "Research results can be widely used by all users" *1
 - Acceleration of knowledge creation, creation of new value
 - "Making the research process transparent to society and widespread utilization of research results" *1
 - Citizen participation, international exchange

Open science is being promoted worldwide and in Japan.

*1: 5th Science and Technology Basic Plan, Main Text, p. 32
<http://www8.cao.go.jp/cstp/kihonkeikaku/5honbun.pdf>
(translated by the author)

National Movements Regarding Open Science

- “The national government will collaborate with **funding agencies, research institutions such as universities, researchers, and other related parties** to build a system that promotes open science.” *1
- Basic stance of the national government
 - Expand the use of publicly funded research results to the extent possible
 - Publish research data to the extent possible, while keeping in mind the different storage and sharing methods by field

*1: 5th Science and Technology Basic Plan, Main Text, p. 32
<http://www8.cao.go.jp/cstp/kihonkeikaku/5honbun.pdf>
(translated by the author)

Measures Against Research Fraud

- Expectations for preventing research fraud through research data management
 - *Guidelines for Responding to Misconduct in Research* (Ministry of Education, Culture, Sports, Science and Technology) *1

p. 10: “For these reasons research institutions need to adopt rules **requiring researchers to keep research data for a set period and to disclose the data as needed**, and these rules need to be enforced properly and effectively.”
 - *Improving the Integrity of Scientific Research* (Science Council of Japan) *2

p. 8: “**As a general rule, the storage period of materials (e.g., documents, numerical data, images) is 10 years after the publication of the relevant article.** Digitized data will be stored in a reusable format by metadata organization and management as well as the creation of appropriate backups.”

Universities and research institutions are now required to manage and store data on a daily basis so that they can be disclosed as needed.

*1 https://www.mext.go.jp/a_menu/jinzai/fusei/_icsFiles/afieldfile/2015/07/13/1359618_01.pdf

*2 <http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-k150306.pdf> (translated by the author)

Research Data Policies

Various policies are currently being created with regards to research data management, disclosure, and storage, and these policies must be followed. Please regularly check the policies you need to follow as you progress with your research.

① Research institution policy

- Your research institution may have established policies regarding research data management, publish, and storage.

② Funding agency policy

- When research funds are allocated by the government or research funding organizations, then research data management in line with the policy set by the funding organization will need to be followed.
- There are cases where a research data management plan needs to be submitted at the start of the research.

③ Academic society / publisher policy

- When submitting research results to an academic journal, publishing data may be required in line with the data policy established by the academic society or publisher.

Kyushu University Policies

The following policies and guidelines have been established at Kyushu University.

- **Kyushu University Research Data Management and Sharing Policy and Commentary**

(decided by Educational Research Council on March 16, 2023)

- **Policy** https://rds.dx.kyushu-u.ac.jp/en/research_data_policy

- **Commentary**

- https://rds.dx.kyushu-u.ac.jp/wp-content/uploads/2024/06/KU_DataPolicy_commentary_en.pdf

- **Guidelines for Research Data Storage**

(implemented August 18, 2015)

- <https://www.kyushu-u.ac.jp/ja/research/ethics/propulsion/>

Definition of Research Data

- What is **research data**?
 - Information collected or generated during or as a result of research
 - Information used to test a hypothesis and a basis for drawing a conclusion
 - Records used to confirm whether research results are correct
- Not only **electronic data** but also **paper-based information** and actual materials (e.g., synthesized substances, items excavated from excavations) can also be considered research data.
 - *In this learning material, electronic data management is mainly explained.
- Research data can be in various formats, such as text or 3D models, as well as research notes, photographs, and audio tapes.

What Constitutes Research Data?

Research data consists of various things, as shown below.

- Document files, spreadsheets
- Questionnaires, transcripts, codebooks
- Photographs, film
- Slides, artifacts, specimens, samples
- Statistical data files
- Models, algorithms, scripts
- Methodologies, workflows
- Experiment notes, field notes (field research records), diaries
- Audio tapes, video tapes
- Reactions and responses to tests and inspections
- Collections of digital materials acquired and generated in course of research
- Database contents (video, audio, text, images)
- Application software
- Standard operating procedures

Research Data Life Cycle

Research data management is related to all processes of research activities. This learning material explains important precautions when managing research data in line with the research process.

