International Trends of Research Data Management   & Sharing (RDM/RDS) Policies in the "Open Science Era"

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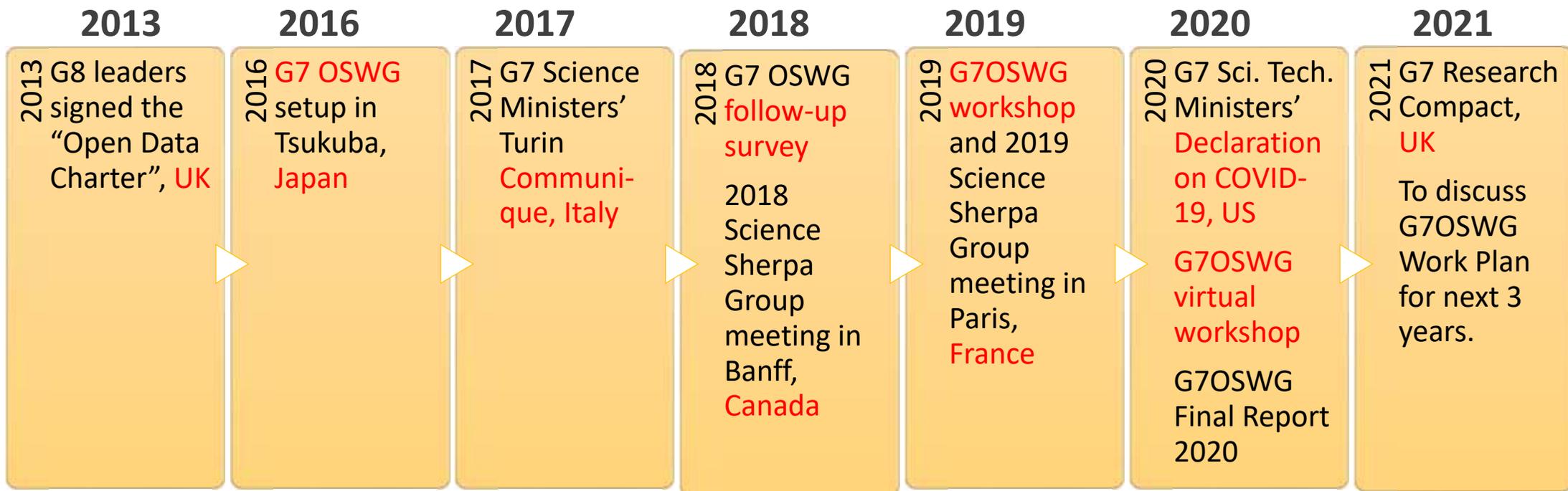NICT (Natl. Inst. Of Information & Communications Tech.), Japan

2021/7/21-23

https://www.un.org/en/library/OS21

G7 Open Science Discussions and Japan

- In **2013, UK,** G8 agreement was a key for the JP govt's to start actions.
- In **2016, JP,** G7 Science Ministers agreed to establish G7 Open Science WG (G7OSWG) (co-chaired by **EC** & **JP**)
- Focused on 1) **incentives/rewards** for OS-practice and 2) research (data) **infrastructures**

2013	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
2013 G8 leaders signed the "Open Data Charter", UK	2016 G7 OSWG setup in Tsukuba, Japan	2017 G7 Science Ministers' Turin Communique, Italy	2018 G7 OSWG follow-up survey 2018 Science Sherpa Group meeting in Banff, Canada	2019 G7OSWG workshop and 2019 Science Sherpa Group meeting in Paris, France	2020 G7 Sci. Tech. Ministers' Declaration on COVID-19, US G7OSWG virtual workshop G7OSWG Final Report 2020	2021 G7 Research Compact, UK To discuss G7OSWG Work Plan for next 3 years.

Japanese national "Integrated Innovation Strategy"

- Cabinet Office & Natl. Expert Panel of Open Science Promotion
  - 2015: Frist National Report of Open Science Principles
    "Opening up a new era for the advancement of science---" https://www8.cao.go.jp/cstp/sonota/openscience/
  - 2018: Guidelines
    1. for data policy (natl. research inst.)
    2. for trusted data repository → Harmonized with Intl. trends
- Sub-WG for building res. data Infrastructure (1st report Oct. 2019, 2nd Mar. 2021)
  - "Moonshot Research & Development Funding Program" (by Cabinet Office)
    - promotes high-risk, high-impact R&D, including <u>Res. Data Management with OS principles</u>

(Note: All English on this slide is tentative translation by Y. Murayama except for the report 2015)

Science Council of Japan

- **Formal "Open Science" committees 2015~** (proposed by the council presidents):
    1. <u>Dec. 2015 --July 2016:</u> Committee for examination of Open Science promotion
    2. <u>Dec. 2018--Sept. 2020 :</u> Committee for deepening and promoting Open Science
    3. <u>2020--Sept. 2023:</u> Committee for building & use of data infrastructure to promote OS

- **Disciplinary data committees:**
    - Informatics Division: e.g., International Science Data Committee (mother body of natl. comms. of CODATA & WDS)
    - Bio-science Division: Bio-informatics Committee (inter-division joint body of biology, agricultural, medical, pharmacy and information sciences)
    - Earth and Planetary Science Division: Academic Data Sharing sub-committee, Academic Sample Sharing sub-committee

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Examples OS Practices in Japan

To-DO or Doing

- Community engagement (for culture change)
- Research Communities

1. Guideline of Data Policy for Natil Research Inst. (2018)

2. DMP by Public Funders JST, AMED, NEDO (2017-)

3. Data Management Infrastructure (RDM, IR, Search) NII Research Data Cloud etc. Ongoing (2020-)
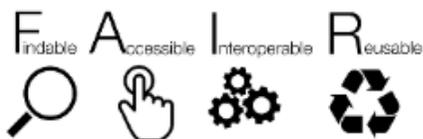
4. Guideline of Research Data Repository (2019)

CORE TRUST SEAL ✓

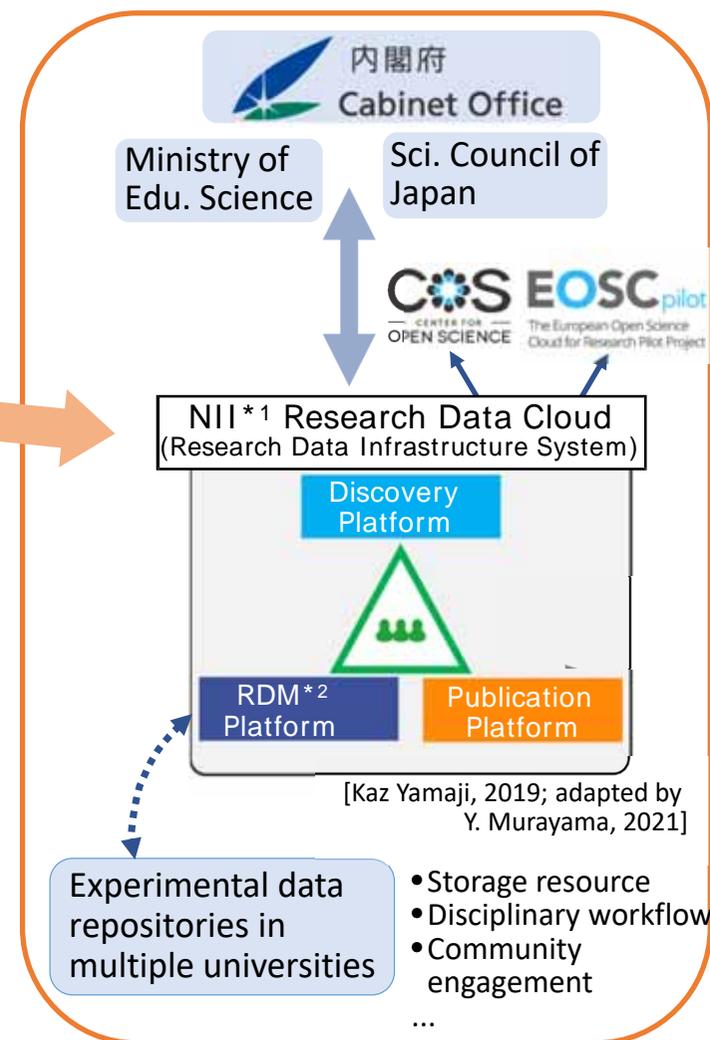5. Association with E-journal Data Publishing JST (2021-)

6. OS Progress Monitoring Natl. Inst. S&T Policy (2019-)

7. Pilot program Cabinet Office (2019)

"Moonshot R&D Program"

Findable **A**ccessible **I**nteroperable **R**eusable

/www.codata.org/working-groups/fair-data-expert-group

内閣府 Cabinet Office

Ministry of Edu. Science

Sci. Council of Japan

C✹S CENTER FOR OPEN SCIENCE

EOSC pilot The European Open Science Cloud for Research Pilot Project

NII[*1] Research Data Cloud (Research Data Infrastructure System)

- Discovery Platform
- RDM[*2] Platform
- Publication Platform

[Kaz Yamaji, 2019; adapted by Y. Murayama, 2021]

Experimental data repositories in multiple universities

- Storage resource
- Disciplinary workflow
- Community engagement
...

1) Natl. Inst. Informatics
2) Research Data Management

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Genome data: academic data sharing incl. COVID-19

INSDC

- International Nucleotide Sequence Database Collaboration
- Consists of ENA, NCBI GenBank and DNA Data Bank of Japan
- Databases are synchronized on a daily basis
- http://www.insdc.org

ENA European Nucleotide Archive

NCBI

DDBJ DNA Data Bank of Japan

Goal

To provide a comprehensive record of the world's nucleotide sequencing information, covering raw sequencing data, sequence assembly information and functional annotation

[Bert Overduin (2012) Is adapted by Y. Murayama]
[Acknowledgement: M.Arita, DDBJ, 2021]

PAG XX, January 15th 2012, San Diego
EBI Database Workshop

EMBL-EBI

How we connect to the international data infrastructure ?

1.　　　　　　　　EUDAT
   PANGAEA, Dryad, Zenodo,
   figshare etc.

2.　　　　　　　　：

　　　　　　　(EOSC　EU
　67　€　　　)

-
-
- _____　　　　　　　DOI　ORCID

  -
  -
  - 　　　　　　　　RDA, ORCID, WDS　CODATA,

-
?
-

NII Research Data
Cloud

　　　DNA
　　Japan
　　etc.

-
  - →
  - →

Towards Global Open Science environment

1.

2.   etc.

        Etc…

Top-down Approach
(eg. Inter-Governmental, Governmental, International

国際研究データ基盤

- 世界的に必要とされる、共通基盤、標準的手法の整備

国内のデータ基盤

各国・各機関
データ基盤

-
- FA

        Etc…

データ管理業務
モデル、システム
の調査研究
⇔スタッフの訓練

各研究機関での個別研究データ構築

各研究者の観測、実験、データ取得

個別機関・研究データ構築

海外研究機関、データ生成

Bottom-up Approach
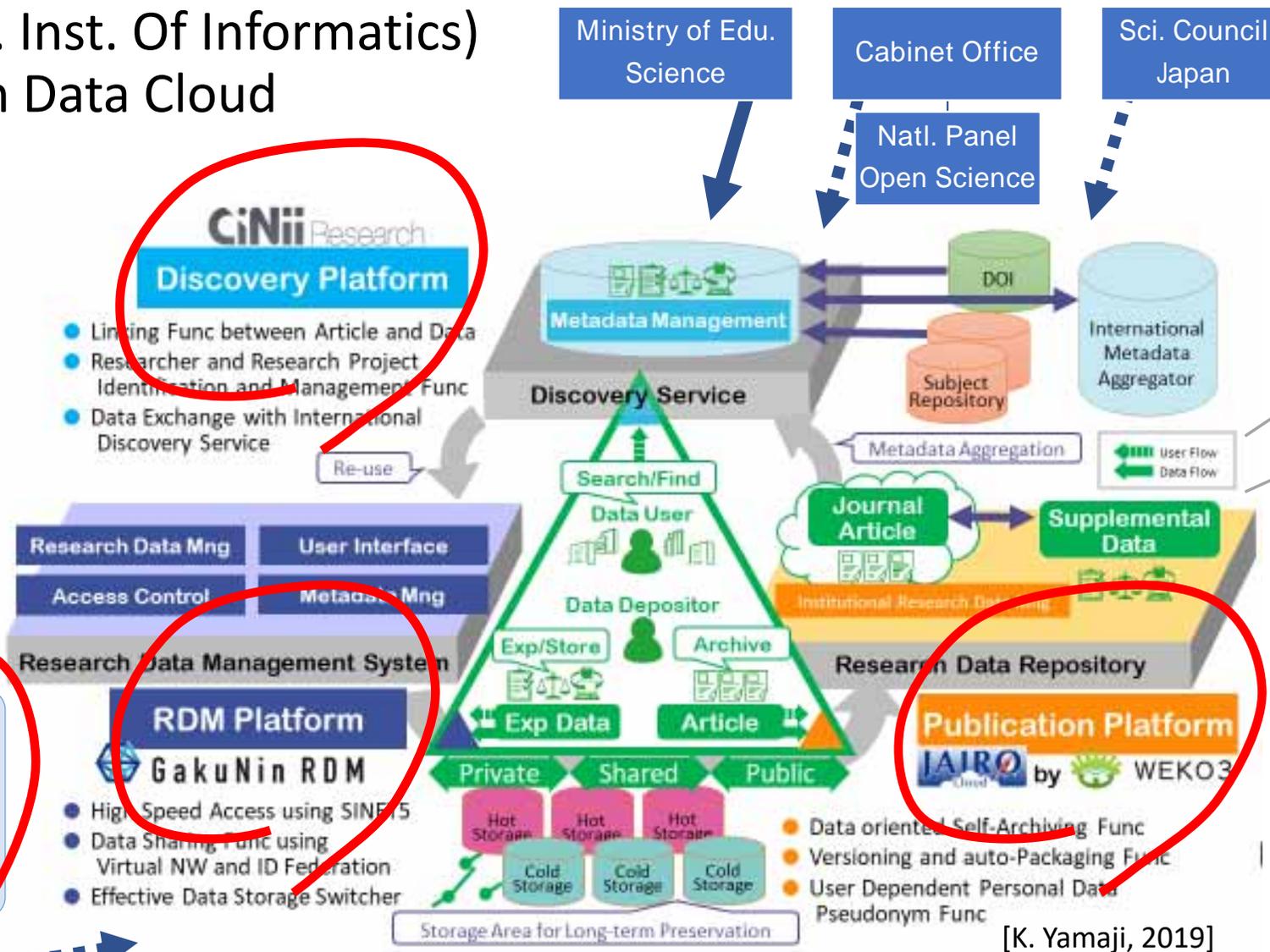**(eg. Research Community-based, Local-based, Domain-based)**

Lessons Learned, helpful for research output management & research ecosystem

1. Importance was recognized of the timely sharing of scientific knowledge and data (likely pushing Open Science in the govt.).

2. Part of the scientific community found needs of changes in culture (and norm) in sectors of STI, citizen, economy and government, with help of ICT technology and infrastructure.
    ➔ Digital Transformation (DX) in many scenes of the Society.

3. The Japan's Govt. proposed "Society 5.0" --- the Human-centric society with highly developed fusion of cyber & physical spaces, to enable economic growth and to solve societal challenges (SDGs etc.).

4. It appeared in the 5th National Sci. & Tech. Basic Plan 5 years ago. In 2021, the new 5-year "6th" Basic Plan started with more DX of the Society with COVID-19 and beyond.

5. It targets the welfare of the human society with DX, and the society with "Trust", as a global value of "Society 5.0".

NII (Natl. Inst. Of Informatics) Research Data Cloud

[K. Yamaji, 2019]

- Storage resource
- Disciplinary workflow
- Community engagement
  ...

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