Promoting Open Science in Korea: Promises and Challenges

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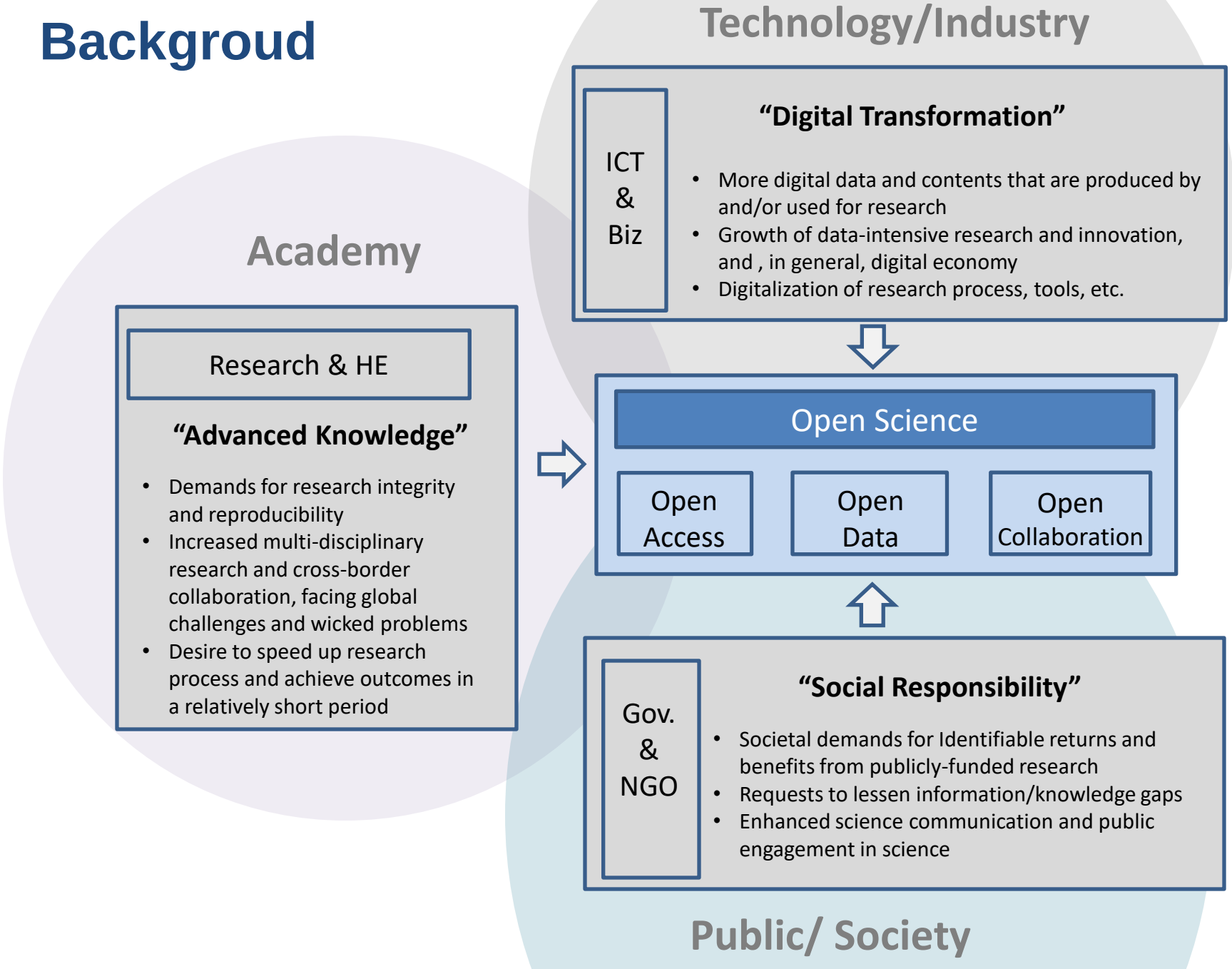
It was once presented at the Asia OA Meeting 2020(Sep. 9th)

Content

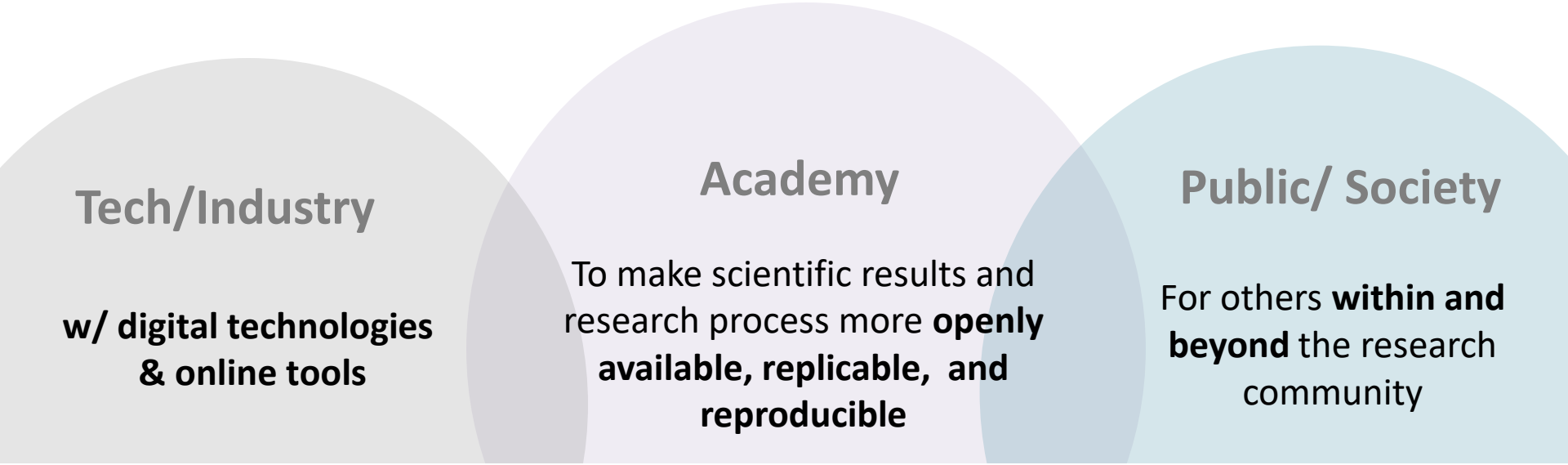
- General Concepts and Practices
- Policy Efforts to Promote Open Science
- Researchers' Perceptions and Practices
- Promises, Challenges and Future Directions

General Concepts and Practices

Backgroud


Technology/Industry
ICT & Biz
"Digital Transformation"
More digital data and contents that are produced by and/or used for research
Growth of data-intensive research and innovation, and , in general, digital economy
Digitalization of research process, tools, etc.
Academy
Research & HE
"Advanced Knowledge"
Demands for research integrity and reproducibility
Increased multi-disciplinary research and cross-border collaboration, facing global challenges and wicked problems
Desire to speed up research process and achieve outcomes in a relatively short period
Open Science
Open Access
Open Data
Open Collaboration
Gov. & NGO
"Social Responsibility"
Societal demands for Identifiable returns and benefits from publicly-funded research
Requests to lessen information/knowledge gaps
Enhanced science communication and public engagement in science
Public/ Society

General Concept & Definition



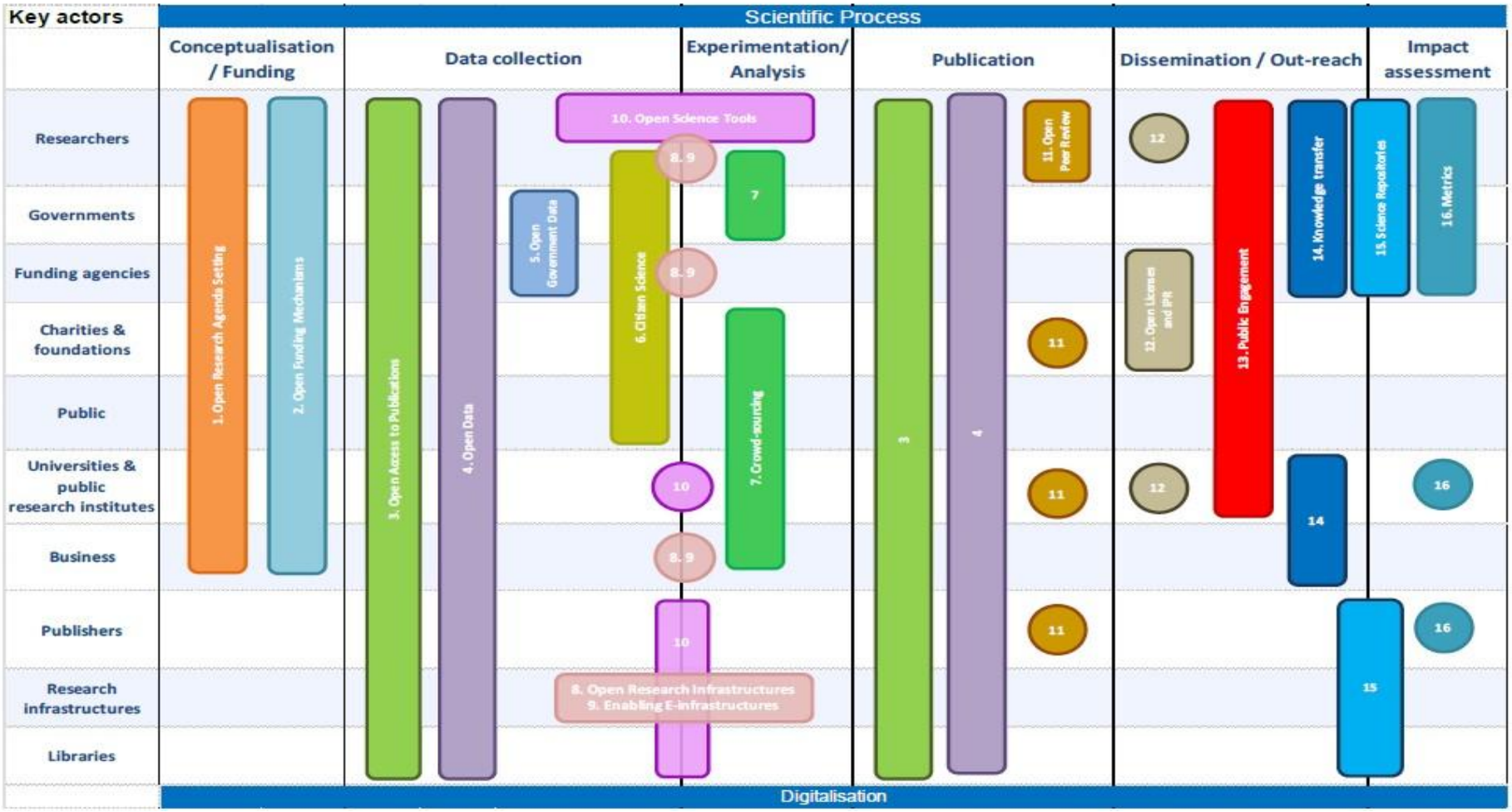
Open Science

efforts to make the scientific process more open and inclusive for all relevant actors, within and beyond the scientific community, as enabled by digitalisation

- Dai, Shin, Smith (2018) OECD STI working papers 7

Diversified Practices

- Various activities, from open research funding to open evaluation
- May include Open Source, Open Education, Citizen Science



Dai, Shin & Smith (2018), p.9

Practical Definitions

CAO (2015)	Open Access	Open Research Data	Open Research Activities	Open Source	Open Innovation	Open Gov. Data	Open License	
FOSTER (2015)	Open Access	Open Data	Open Workflow, Labnotes	Open Source	Open Science Evaluation	Open Science Tools	Open Science Policies	
Bosman & Kramer (2017)	Open Access	Open Research Data	Open Workflow, Labnotes	Virtual Labs	Open Source	Crowd-Sourcing, funding	Open Profile, CVs	Open / Alternative Evaluation
Dai, et al. (2018)	Open Access	Open Research Data	Open Research Infra.	Crowd-Sourcing, funding	Open research infra	Open License	Alternative Metrics	Citizen Science	Public Engage-ment
EU OS Monitor (2019)	Open Access	Open Research Data	Open Hardware	E-lab notebook	**Open Code**	Open License	Open Peer Review	Citizen Science
UNESCO (2020)	Open Access	Open Data	Open Hardware, Open Lab, notebook	**Open Source**	Open Evaluation	Crowd-funding	Citizen Science	Open Innovation	Open Educational Resources

Common Categories

- **Include at least three categories: OA, OD, OC**

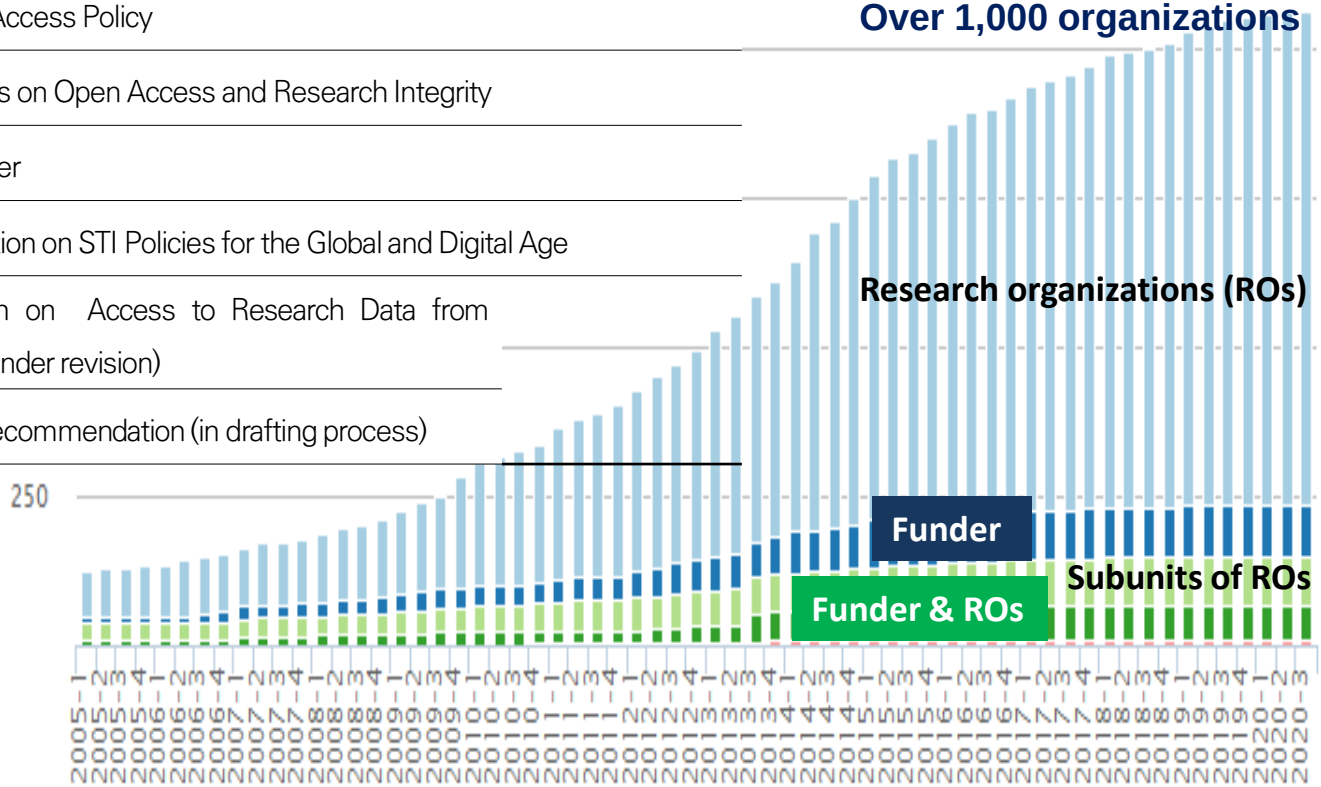
OA	Efforts to enhance **open access to publications** and make them freely available to readers and end-users (via OA journals, OA repositories, etc.)
OD	Efforts to enhance **access to research data** and make them more usable to others (via online repositories, systematic management plans and tools, etc.)
OC	Online research collaboration and communication activities in which researchers share their research process and outputs with others, within and beyond research communities

EC (2018) Open Science Monitor, Shin et al(2018)

Policy Efforts to Promote OS

Open Science Policies in the World

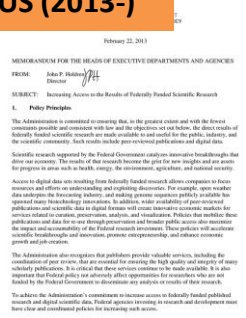
Year	Organization	Policy or Declaration
2002	OSI	Budapest Open Access Initiative
2003	MPG	Berlin Declaration on Open Access to Knowledge (…)
2007	OECD	Principles and Guidelines for Access to Research Data from Public Funding
2011	World Bank	Open Data Portal
2012	UNESCO	UNESCO Open Access Policy
2013	GRC	Berlin Statements on Open Access and Research Integrity
2013	G8	Open Data Charter
2015	OECD	Daejeon Declaration on STI Policies for the Global and Digital Age
2020	OECD	Recommendation on Access to Research Data from Public Funding (under revision)
2021	UNESCO	Open Science Recommendation (in drafting process)



ROARMAP (2020) Registry of OA Repository Mandates and Policies, http://roarmap.eprints.org

Open Science Policies by Country/Region

US (2013-)



February 22, 2013

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren
Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.

Access to digital data sets resulting from federally funded research allows companies to focus resources and efforts on understanding and exploiting discoveries. For example, open weather data underpins the forecasting industry, and making genome sequences publicly available has spurred many biotechnology innovations. In addition, wider availability of peer-reviewed publications and scientific data in digital formats will create innovative economic markets for services related to curation, preservation, analysis, and visualization. Policies that mobilize these publications and data for re-use through preservation and broader public access also maximize the impact and accountability of the Federal research investment. These policies will accelerate scientific breakthroughs and innovation, promote entrepreneurship, and enhance economic growth and job creation.

The Administration also recognizes that publishers provide valuable services, including the coordination of peer review, that are essential for ensuring the high quality and integrity of many scholarly publications. It is critical that these services continue to be made available. It is also important that Federal policy not adversely affect opportunities for researchers who are not funded by the Federal Government to disseminate any analysis or results of their research.

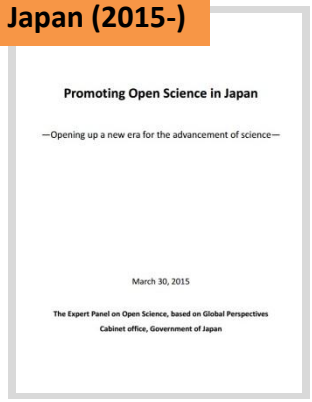
To achieve the Administration's commitment to increase access to federally funded published research and digital scientific data, Federal agencies investing in research and development must have clear and coordinated policies for increasing such access.

Finland (2014-)

openscience.fi

OPEN SCIENCE AND RESEARCH

Japan (2015-)



Promoting Open Science in Japan

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

March 30, 2015

The Expert Panel on Open Science, based on Global Perspectives
Cabinet office, Government of Japan

openscience.jp

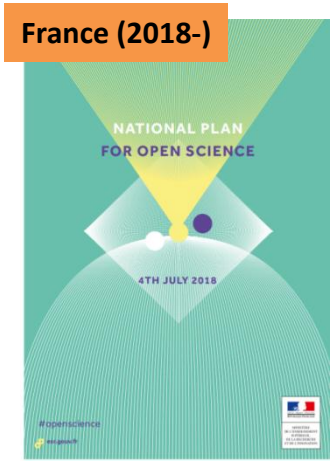
Research Data | OA | Open Education | Repository | Metrics | Institution / Community | Bibliography

Netherland (2017-)

SURFmarket bv [NL] | https://www.openscience.nl

nationaal plan open science

France (2018-)



EU (2015-)

RESEARCH & INNOVATION
Open Science

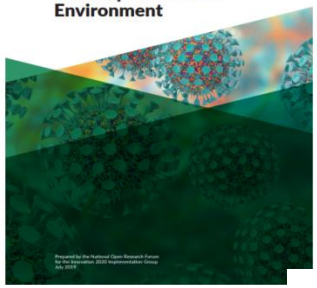
EU (2020)

Progress on Open Science: Towards a Shared Research Knowledge System

Final Report of the Open Science Policy Platform

Ireland (2019-)

National Framework on the Transition to an Open Research Environment



NORF
NATIONAL OPEN RESEARCH FORUM

African region (2018-)

Korea's Global Policy Dialogues w/ int'l orgs

"Daejeon Declaration on STI Policy for Global and Digital Age(2015)"

- Support the positive transformational impacts of digital technologies on research and innovation in order to promote "open science."

"Korea-OECD Workshop on Open Science(2017)"

- Discuss main achievements and challenges in emerging open science practices

"UNESCO Virtual Ministerial Dialogue on Covid-19 and Open Science(2020)"

- Reaffirm the importance of open science & international collaboration in the combat against COVID-19 pandemic

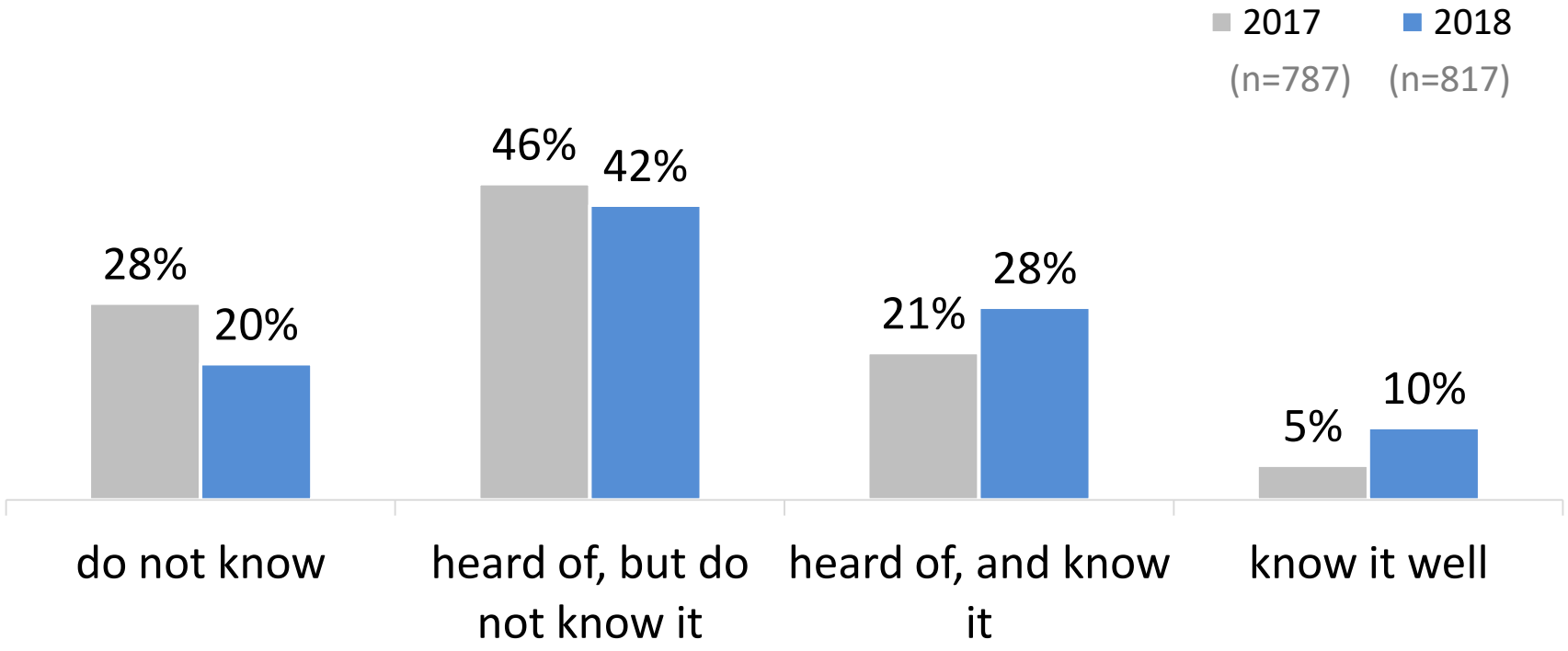
Korean Domestic Policies & Initiatives

Title	Contents
Open Access Korea (2009-)	• governmental project to support OA repositories
Public deposit regulation (2006-)	• Mandate to deposit research outputs as well as basic information on the outputs of the national R&D projects to the designated OA repositories
Research Data Strategy (2018-)	• Strategy to Promote Sharing and Use of Research Data for Innovative Growth
Research Data Pilot Project (2018-)	• governmental project to support data-driven research and facilitate data sharing in a research community
Regulation on DMP (2019-)	• rules and guidelines to implement a data management plan in a certain national R&D project that is selected by the government

Researchers' Perceptions/Practices

Researchers' Awareness

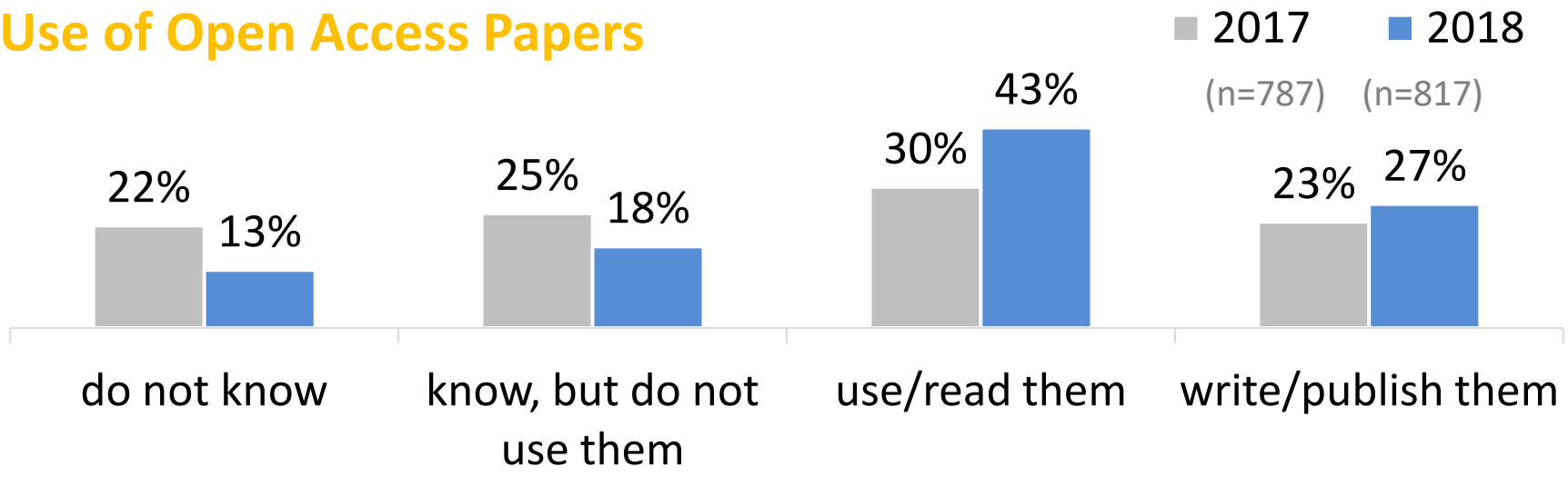
Awareness of Open Science



Source: Data from Korean domestic surveys (An et al., 2017 & Shin et al., 2018)

Researchers' Use of OA papers

Use of Open Access Papers



Existing Access Barriers to Publications

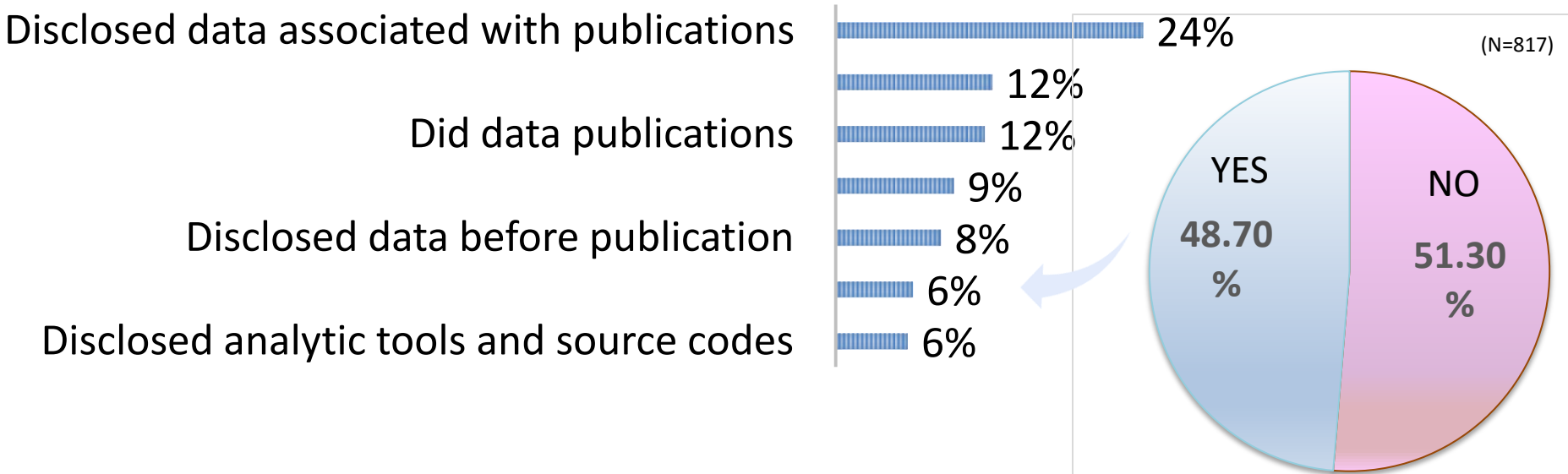
- Financial burden to pay both APCs of OA papers and subscription fees of non-OA journals
- Legal uncertainty to post self-archived publications to public access repositories
- Cognitive/organizational tendency to favor previous non-OA journals over OA ones

Researchers' Data Sharing

◆Data Sharing with few references

- Data sharing, less popular than OA publishing
- Few references, insufficient incentives & recognition, and technical/legal burden associated with data sharing

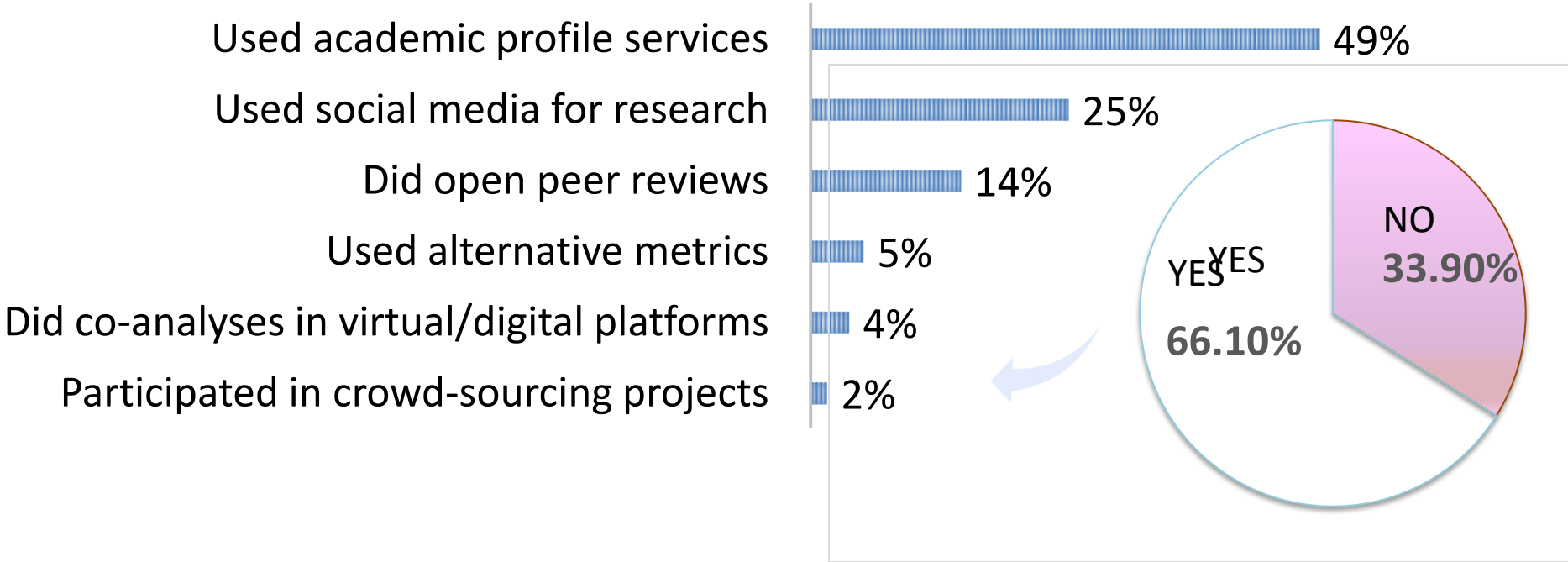
- Unresolved concerns on data quality, privacy, security, intellectual property, and other unexpected loss/misuse of data



Researchers' Use of Online Tools

◆Limited Use of Online Collaboration Tools

- Online services used mainly for information diffusion & career management
- Little done for real-time interaction/collaboration with others
- Few attempts to engage citizens in science



Association b/w OS Practices & Performance

Perceived outcomes of OS Practice

	Scientific outcome	Economic outcome	Societal outcome
Average	4.0	3.9	3.9

1 (negative) - 3 (neutral) - 5 (positive)

Association b/w OS Practice and Research Performance

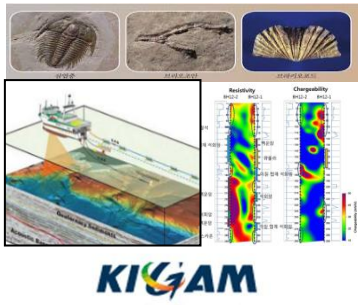
	Scientific outputs	Technical/economic outputs	Societal/Educational outputs
Awareness of OS	(++)	-	(++)
Use of OA papers	(+++)	-	(+)
OD experience	-	-	(+)
OC experience	(+)	-	(+)

Supplementary Findings from Case Studies

Astronomy

Polar Research

Geo science



◆ Association b/w OS Practice and Research Performance

- Identified positive effects of international research data sharing on **scientific discovery, scholarly publications , and student training**
- Use of disclosed research data and tools as **educational resources** in colleges
- Potential benefits for **science communication and citizen scientists**

Particle Physics

Biomedical informatics

Promises, Challenges and More

Promises and Challenges (1)

- Increased Awareness and Needs for Open Science

  - More researchers become aware of open science and open access
  - Increased needs and demands for research data

- Open Science Practices in Transition

  - Use of open access publications, and social media for knowledge diffusion >> Sharing of research data >> public engagement in science
  - Disclosure of research data related to published papers >> Systematic research data management

Promises and Challenges (2)

- Identified Emerging Outcomes and Outputs

  - **Open Access Publications** associated with scientific performance and other societal outcomes for science communication and HE education
  - **Research Data Sharing** within Global Research Community that induces scientific and educational achievements

- Lack of Organizational Supports and National Strategies

  - Mostly done by individual researchers without organizational or public supports
    * A few exceptional cases that had organizational supports for global research data sharing, resulting outstanding returns
  - Lack of a national strategy or plan to promote open science in a comprehensive way, given current policies/projects supporting open access publications and research data management respectively

Suggestions for Next Steps

- **Continue to promote open science perspectives and build up national consensus on open science strategies**

- **Increase public support for open science practice that become acceptable to researchers and accompanied with better/more research outcomes**
  (e.g. global research data sharing projects, data sharing related to publications)

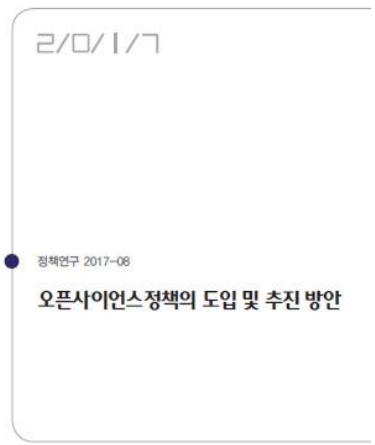
- **Enhance access to research outputs from publicly funded projects by broadening the scope of project information disclosed and revising relevant regulatory requirements and reward systems**

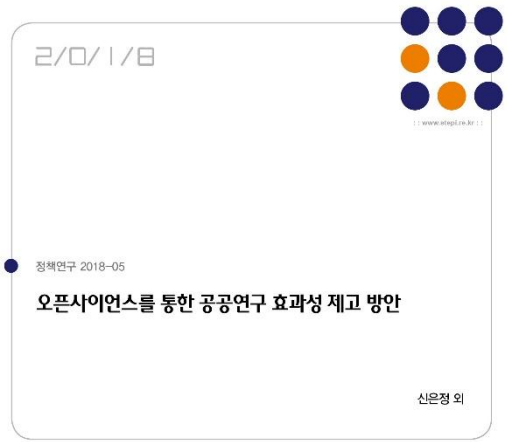
Recommendations for Future Directions

- Establish a national coordination mechanisms through which diverse interests and policies are reviewed, adjusted and improved in a collective way
- Identify feasible business models for open science services and encourage the private sector to develop the services
- Provide digital research infrastructure and services that fill the gap b/w researchers' demands and market supply
- Provide much needed skills and information to scientists and relevant stakeholders
- Empower people to engage in science

Thank you

Further Information





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