DOI: 10.20472/IAC.2016.025.048

SUNG-UK PARK

Korea Institute of Science & Technology Information, South Korea

CASE STUDIES IN OPEN SCIENCE OF SOUTH KOREA

Abstract:

According to European Commission, As scientific research becomes a more open endeavor, all stakeholders of the research ecosystem must redefine their role and their approach to science. Researchers will have to adapt to new possibilities to new tools and to new responsibilities. The innovation ecosystem will also change by embracing more openness and being more inclusive. Funders, academic institutions and policy makers will need to fund, inform, and legislate to accelerate the transition.

Open Science practices are breaking barriers that prevent the free flow of knowledge produced by researchers. The adoption of such practices is bound to redefine the relationships between the stakeholders of research ecosystem and between researchers and society.

In this paper I studied about Open Science include Open Access, Open Data and Open Collaboration. Especially I suggested the National Science & Technology Information Service(NTIS) with Open Science Case in South Korea.

Keywords:

Open Science; Open Access; Open Data; Open Collaboration; NTIS

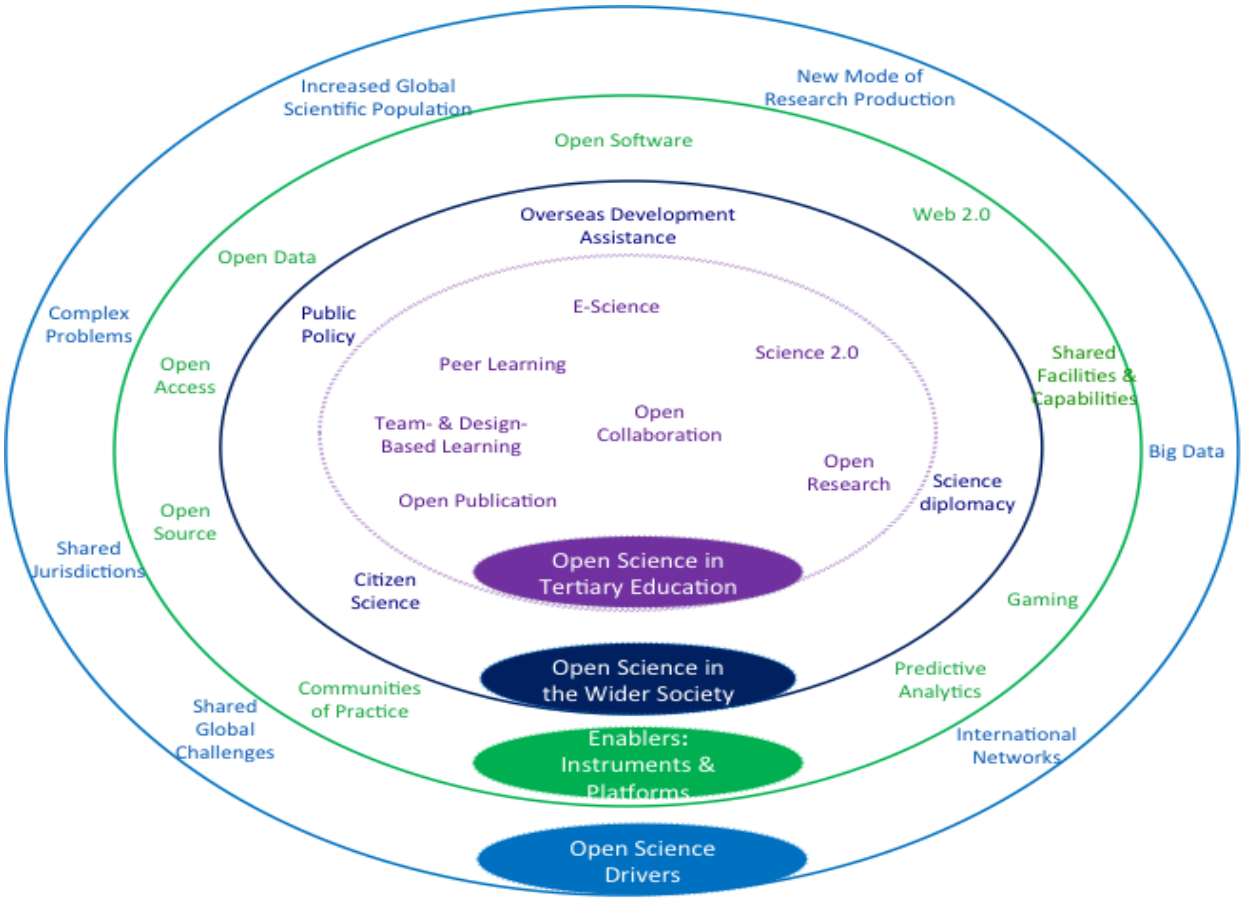
JEL Classification: D80

I. Definition

According to Wikipedia, Open Science is the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society, amateur or professional. It encompasses practices such as publishing open research, campaigning for open access, encouraging scientists to practice open notebook science, and generally making it easier to publish and communicate scientific knowledge. The European-funded project Facilitate Open Science Training for European Research(FOSTER) has developed an open science taxonomy as an attempt to map the open science field.

Also, According to Jami Salmi, in the public consultation document prepared by the European Commission, Open Science is defined broadly as, “a systemic change in the modus operandi of doing research and organizing science”. Generally speaking, the paradigm shift embodied by Open Science refers to the rapid development, facilitated by networks that rely on modern information and communication tools. This recent evolution encompasses several interrelated trends and phenomena, ranging from citizen science to web 2.0. Figure 1 is category of Open Science.

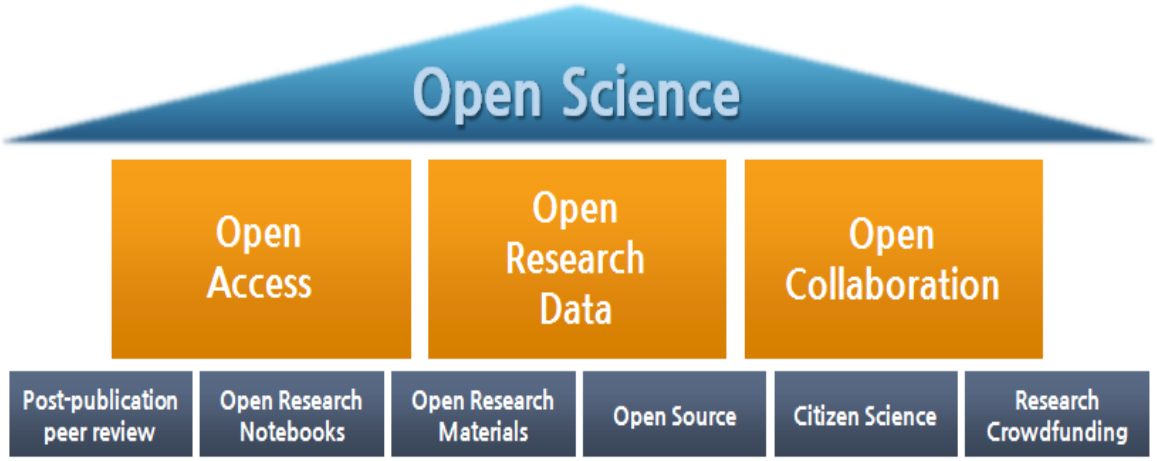
Figure 1. Category of Open Science



Source: Elaborated by Jamil Salmi

In South Korea, According to KISTI, Open Science covers Open Access, Open Data and Open Collaboration. In this paper, I will study the Open Science of South Korea. So I research Open Access, Open Data and Open Collaboration. Finally I will introduce the Open Science Case of South Korea.

Figure 2. Specific area of Open Science



Source: KISTI

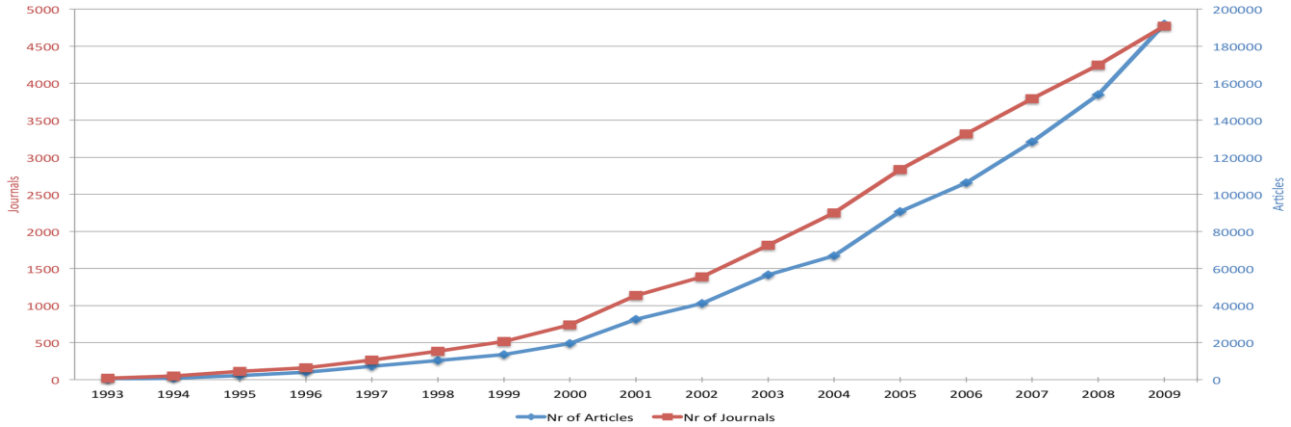
II. Open Access

According to Wikipedia, Open Access refers to online research outputs that are free of all restrictions on access and free of many restrictions on use. Open access can be applied to all forms of published research output, including peer-reviewed and non peer-reviewed academic journal articles, conference papers, theses, book chapters, and monographs.

The term “Open Access” itself was first formulated in three public statements in the 2000s: the Budapast Open Access initiative in February 2002, the Buthesda Statement on Open Access Publishing in June 2003, and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in October 2003, and the initial concept of open access refers to an unrestricted online access to scholarly research primarily intended for scholarly journal articles.

The development of the number of active open access journals and the number articles published in them during the period 1993-2009 is shown in the Figure 3.

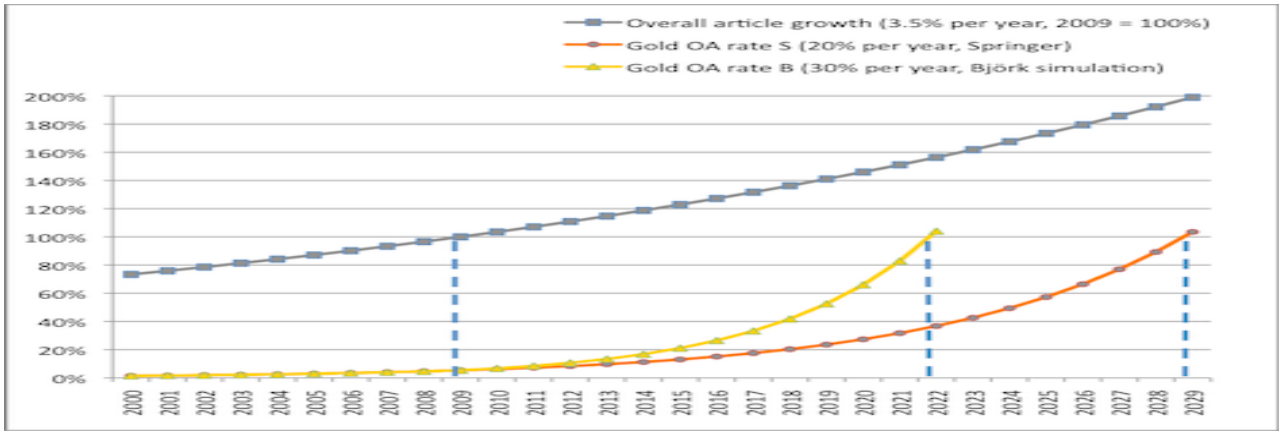
Figure 3. Development of Open Access



Source: Wikipedia.

If these gold open access growth curves are extrapolated to the next two decades, the Laakso et al. curve would reach 60% in 2022, and the Springer curve would reach 50% in 2029 as shown in the Figure below.

Figure 4. Gold open access growth projections



Source: Wikipedia.

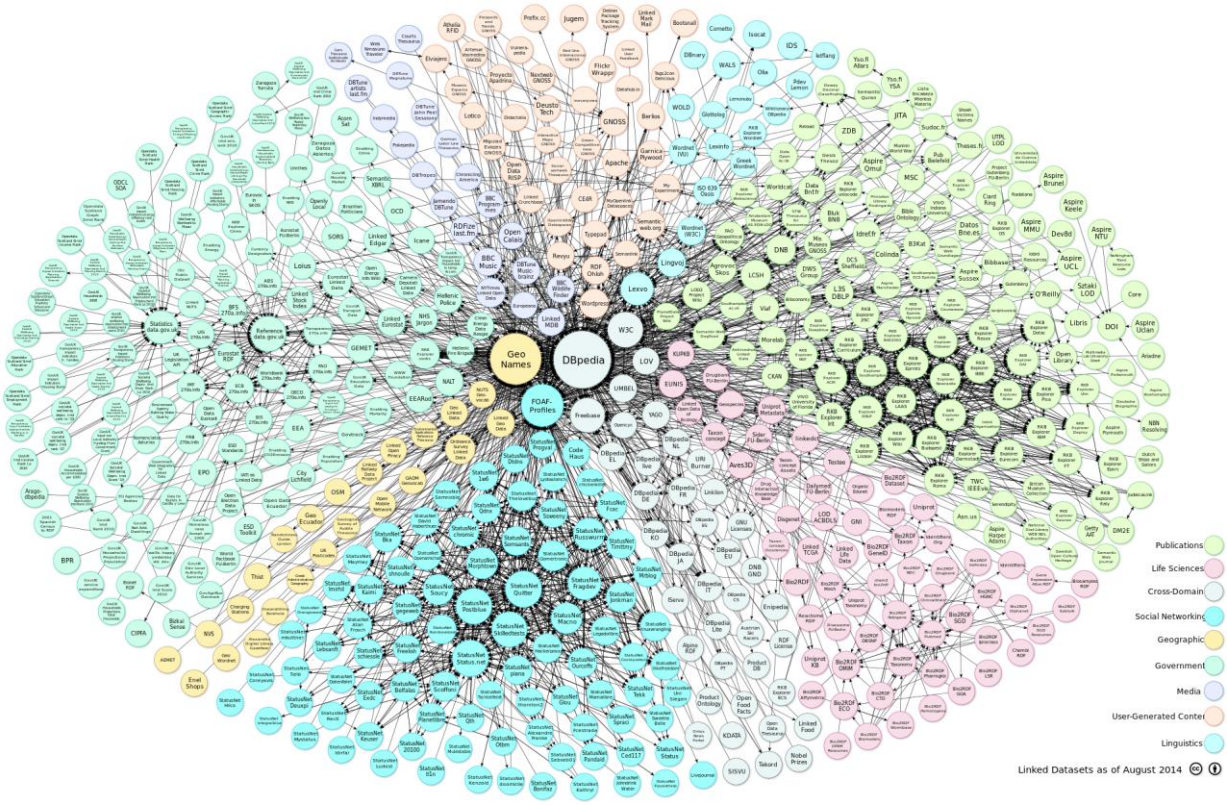
III. Open Data

According to Wikipedia, Open Data is the idea the some data should be freely available to everyone to use and republish as the wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other “Open” movements such as open source, open hardware, open content, and open access. The philosophy behind open data has been long established, but the term “Open Data” itself is recent, gaining popularity with the rise of the internet and World Wide Web and especially with the launch of open data government initiatives such as Data.gov and Data.gov.uk.

The concept of open data is not now, but a formalized definition is relatively new – the

primary such formalization being that in the open definition which can be summarized in the statement that “A piece of data is open if anyone is free to use, reuse, and redistribute it – subject only, at most, to the requirement to attribute and/or share-alike”.

Figure 5. Linked open data cloud



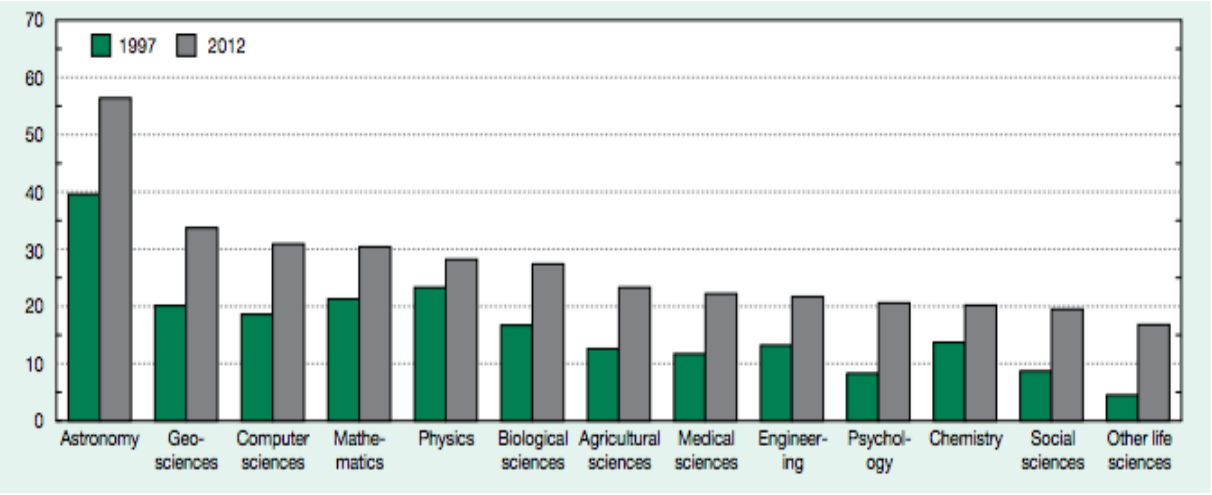
Source: Wikipedia.

IV. Open Collaboration

According to Wikipedia, Open Collaboration is a pattern of collaboration, innovation, and production. It was observed prominently in open source software, but can also be found in many other instances, such as in internet forums, mailing lists, and online communities. Open Collaboration is also thought to be the operating principle underlining a gamut of diverse ventures, including bitcoin, TEDx, and Wikipedia. Open Collaboration is the principle underlying peer production, mass collaboration, and wikinomics. It was observed initially in open source software, but can also be found in many other instances, such as in internet forums, mailing lists, internet communities, and many instances of open content, such as creative commons. It also explains some instances of crowdsourcing collaborative consumption and open innovation.

According to Jamil Salmi, The degree of collaboration is field dependent, as can be seen in Figure 6, which also confirms the rapid growth of collaborations over the past 15 years. Astronomy, geo-sciences, computer sciences and mathematics have the highest level.

Figure 6. Levels of Collaboration by Broad Scienctific Discipline(1997-2012)



Source: Jamil Salmi.

V. Open Science Case of South Korea

In South Korea, I introduce Open Science Case through National Science & Technology Information Service(NTIS). According to NTIS homepage, NTIS provides all national R&D information in real time World's first national R&D information portal which provides government-funded R&D information on topics such as programs, projects, human equipment/facilities and outcomes in real time.

Major Services of NTIS are as follows.

1) National R&D Program Management: Helps industrial, academic and research institutes share and utilize the information on the current status of national R&D programs as well as the investigation and analysis of that information.

2) National R&D Participation Information: Provides detailed information on the researchers participating in national R&D programs, an evaluator suggestion service and a scientist and engineer registration service.

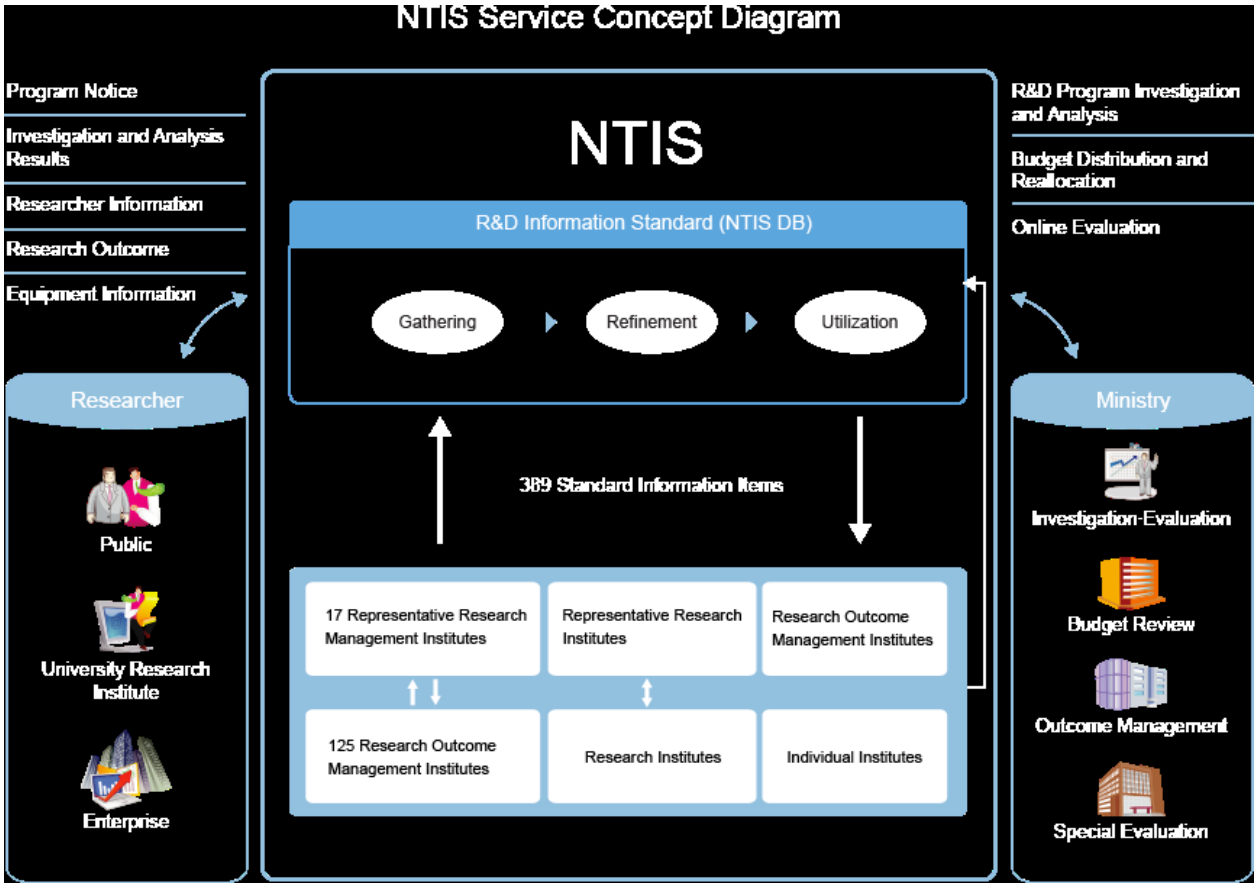
3) National R&D Equipment/Facilities management: Offers diverse information on research equipment/facilities constructed and acquired through national R&D programs and helps to systematically manage government-wide equipment/facilities.

4) National R&D Outcome Information Service: Analyzes and manages the major outcomes of national programs and shares them at the national level.

5) Science Technology Statistics: Provides science and technology related statistical information gathered from S&T private institutions and OECD reports.

6) NTIS Cloud: Allows users to view national R&D source data and to use information analysis tools such as Excel in a virtual Personal Computer environment to perform analyses that satisfy their needs.

Figure 7. NTIS Service concept diagram



Source. NTIS Homepage.

VI. Conclusions

According to OECD, Open Science commonly refers to efforts to make the output of publicly funded research more widely accessible in digital format to the scientific community, the business sector or society more generally. Open Science is the encounter between the age-old tradition of openness in science and the tools of information and communications technology that have reshaped the scientific enterprise and require a critical look from policy makers seeking to promote long-term research as well as innovation.

In this paper, I suggested National Science & Technology Information Service(NTIS) with Open Science Case in South Korea. NTIS provides the list of National R&D projects in South Korea. Researchers can get the title and budget information on each project through a keyword search. Everyone can also search by the year that project was performed since 2002. Also NTIS provides the summary information of National R&D reports collected through NTIS. Everyone can search by the keyword of the year of publication and get the title and abstract of the project related to the keyword through the service.

References

Jamil Salmi, Study on Open Science, European Commission, Aug. 2015.

European Commission, Science Ecosystem 2.0: how will chage occur: July. 2015.

Wikipedia, Open Science, https://en.wikipedia.org/wiki/Open_science, July. 2016.

Wikipedia, Open Access, https://en.wikipedia.org/wiki/Open_access, July. 2016.

Wikipedia, Open Data, https://en.wikipedia.org/wiki/Open_data, July. 2016.

Wikipedia, Open Collaboration, https://en.wikipedia.org/wiki/Open_collaboration, July. 2016.

KISTI, Scientific Data Management System: Policies and Applications, Dec.2015.

NTIS Homepage, http://www.ntis.go.kr/en/GpIndex.do

OECD, Making Open Science a Reality, Oct. 2015.