Issue-oriented strategies or extensive infrastructure for digital scholarship? The policy, practices and projects of Japanese digital archives and libraries

Takashi Koga
Librarianship Course, Faculty of Human Studies, Tenri University, Tenri, Nara, Japan
E-mail address: tkoga@tenri-u.ac.jp

Abstract:

This article describes reviews, topics, and possible solutions in relation to the policy, practices and projects surrounding Japanese digital archives/libraries. In this context, the concept of digital archives *is preferred over* digital libraries*, not only in Japan, but also worldwide. From the author's perspective, the most problematic issue of Japanese digital archives/libraries is their sustainability, specifically in terms of funding and setting deadlines. In 2020, the Tokyo Olympic and Paralympic Games will be held, which will provide the opportunity to promote Japanese culture through digital archives/libraries. As a potential solution, the author suggests applying open licenses to digital archives/libraries, which would allow users to create their own systems by using the contents, in addition to open systems such as the International Image Interoperability Framework (IIIF). Finally, the author concludes that the policy, practices and projects of Japanese digital archives/libraries should develop extensive infrastructure for digital scholarship globally, rather than issue-oriented strategies for the survival of Japanese culture and intellectual property (IP).*

Keywords: digital archives, digital libraries, Intellectual Property Strategic Program (Japan), sustainability, open license

1. Introduction

The author is a researcher of library and archival science in Japan with interests in access to government information and a wide range of information policies. Recently, the concept of *digital archives* – rather than *digital libraries* – is becoming popular in the country in terms of policy, practices and projects. The author will discuss the possible reasons later in this paper. Given the abovementioned background, however, the author is skeptical about the current Japanese movement surrounding digital archives. This presentation reviews the recent policy, practices and projects of Japanese digital archives/libraries, in addition to the author's

previous presentation (Koga, 2016). The author would like to take this opportunity to facilitate discussion on pertinent topics of digital archives/libraries, as well as common and unique challenges and opportunities in various countries and regions, with colleagues in Malaysia and around the world.

2. The decline of digital libraries and the prosperity of digital archives

First, the author would like to discuss the definitions of *digital libraries* and *digital archives*. Currently, people around the world seem to focus on specific functions of digital libraries – such as the management of electronic contents (e-books and/or e-journals) – rather than *digital libraries* as a comprehensive notion. The same is true of Japan. In the 1990s, several prominent researchers of information science – including Dr. Makoto Nagao, former President of the National Diet Library of Japan – worked extensively to develop the country's digital library (*denshi toshokan*) system (Nagao, 1994). Currently, digital libraries are difficult to identify as a comprehensive idea in relation to academic, professional and popular books and articles, at least in Japan. The *Encyclopedia of Library and Information Sciences* (4th ed., 2018), the broadest and newest international encyclopedia of libraries and related fields, does not include entries such as *digital library* or *digital libraries*, though it does include related entries such as *digital humanities and academic libraries* and *digital images* (McDonald and Levine-Clark, 2017).

The word *digital archives* is becoming popular in Japan and around the world, although it has a vague meaning. In the *Encyclopedia of Archival Science*, Theimer (2015), an independent blogger, author, editor, and educator on archives in the US, summarizes the diverse meanings of *digital archives*:

> (1) Collections of born-digital records.
> (2) Websites that provide access to collections of digitized materials.
> (3) Websites featuring different types of information around one topic.
> (4) Web-based participatory collections.

In addition, Theimer (2015: 159) claims that it is difficult to define digital archives:

> While in professional archival literature, the phrase will perhaps continue to refer primarily to collections of born-digital materials, in common usage both inside and outside the profession, the application of the term to collections of digitized materials from one or many sources, as well as to participatory collections of born-digital collections and to topical websites with digitized content from archival collections, will no doubt continue and expand.

As Theimer cites, Cunningham (2008: 530), one of Australia's leading archivists, laments: "From a recordkeeping perspective, the phrase *digital archive* has been misused, even hijacked."

From the author's standpoint, the decline of digital libraries and the prosperity of digital archives may be due to the public image of *library/libraries* and *archive(s)*. In short, the word and concept of *archives* is less popular than *libraries*. Therefore, policymakers as well as ordinary people can interpret the notion in many ways, though these meanings might be far from the original and cause annoyance to professional archivists such as Theimer and Cunningham.

Figure 1 (Koga, 2015: 50) illustrates the author's idea of the relationships among *library, archives, museums* and a number of similar concepts in relation to *digital archives*. This term stems from the idea of *archive*. Here, *archive* differs from *archives*, which are based on thoughts and practices of recordkeeping[1]. Such digital archives – which are more similar to types (2), (3), and (4) than type (1) as defined by Theimer – are becoming popular, and may take over the idea and/or real system of digital libraries.

Figure 1: A definition of digital archives as suggested by Koga (the author of this paper)
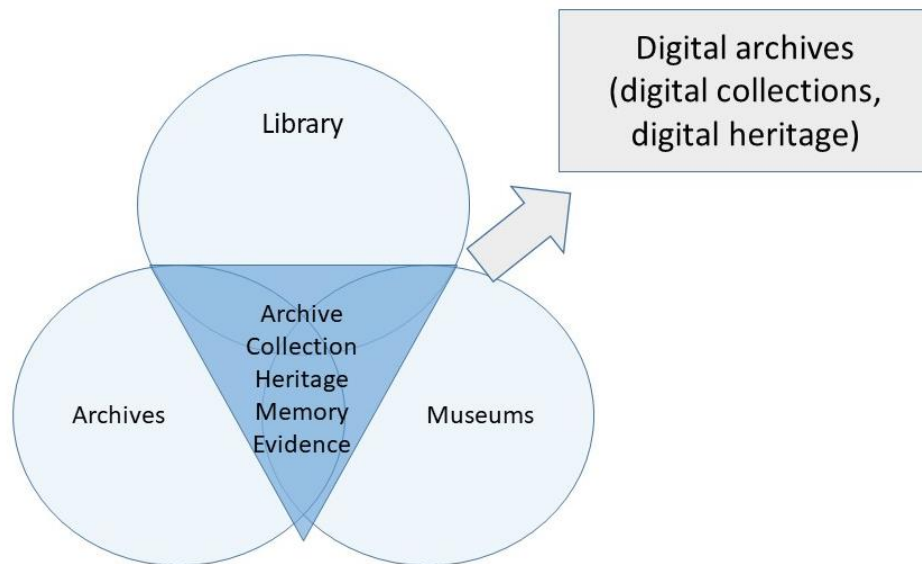
In this paper, the author deals with digital archives as the main subject and does not make a clear distinction between *digital archives* and *digital libraries*. Furthermore, the author uses the phrase *digital archives/libraries*, reflecting the abovementioned ambiguity and relationship between digital archives and libraries.

3. Digital archives/libraries in Japan: Policy

The development of digital archives in Japan started in the mid-1990s, along with the popularization of the Internet. At that time, the definition of digital archives by Dr. Yoshio Tsukio, then a professor of computer science at the University of Tokyo, had a strong influence on the concept's development (Japan Digital Archives Association, 2003):

> Digital archives use digital signal processing and multimedia databases to accomplish restoration and preservation of cultural treasures, and their maintenance as data, to properly pass down to succeeding generations, a task common to mankind.

While many government and public organizations, universities, researchers, libraries, museums and other entities developed their own digital archives based on the abovementioned definition, a number of digital archives have been discontinued after a few

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[1] A clear definition of "recordkeeping" was created by Cumming (2015: 319. emphasis original): "In practice, recordkeeping describes a plurality of coherent, iterative, and inter-dependent processes by which *records* are created, captured, organized, described, managed, and made accessible for multiple purposes over multiple time periods. Recordkeeping is a synthesis of *records management* and archival concerns."

years. The Japan Digital Archives Association, which was established in 1996 by Dr. Tsukio and other stakeholders to promote digital archives, was dissolved in 2005.

Around 2010, with the development of digital archives, digital libraries and digital museums both in and outside Japan, there were cries for strong policy support of digital archives in the country among content holders, librarians, intellectual property (IP) lawyers, information technology (IT) professionals, and printing manufacturers, as well as other stakeholders. Their interests led to the establishment of the Council for Strategic Planning on Cultural Resources (Japan) in 2012, which then published the Archive Japan Manifesto in 2014. The manifesto consists of four major recommendations that reflect a strong interest in digital archives from the viewpoint of cultural promotion, the use of technology, and IP. Moreover, in this manifesto, *digital archives* includes *digital libraries*. The following citation is from the English version (Council for Strategic Planning on Cultural Resources (Japan), 2014):

> *Recommendation 1: Establish a National Digital Archive Center (NDAC)*
> Establish the "National Digital Archive Center" to be tasked the role of connecting the many existing archives in a digital hub and to act as a center and information window to all of Japan's digital archives.

> *Recommendation 2: Provide for the education of human resources who can support digital archives*
> Establish a base of human resources to support digital archives, including culture and art, the undertaking of collecting storing restoring and making public, and emphasizing the fostering of archivists equipped with the appropriate legal knowledge.

> *Recommendation 3: Make Cultural Resources Digital Archive Open Data*
> In accordance with the standards of a global open data initiatives, establish publically open data cultural digital resources that anyone can freely use.

> *Recommendation 4: Drastic Orphan Works Provisions*
> Regarding copyright, ownership rights, and rights regarding the usage of a person's own image, in cases where the rightful beneficiary is unknown (so called Orphan Works), while mapping out a balance that takes appropriate care of rightful beneficiaries, drastic legislative steps should be taken to enable the swift and legal use of orphan works.

More straightforward interests in digital archives/libraries on the part of the national government are reflected in the policy instruments of Japan's Intellectual Property Strategy Headquarters (IPS-HQ). Since 2014, its annual Intellectual Property (IP) Strategic Program has promoted digital archives as a key program. The 2017 version of the program (p. 111) mentions the significance of digital archives in Japan:

> Developing digital archives of various creative content in Japan enables us to collect the country's knowledge beyond the boundaries of sectors and regions. They can be also utilized for academic research, education, disaster prevention and business. Moreover, by adding and enhancing their functions to disseminate information overseas, we can promote inbound tourism and stimulate studies on Japan in overseas countries.

The 2017 version (p. 112) also suggests one of the challenges facing digital archives in Japan:

> In order to realize society where digital archives are utilized in day-to-day life domestically and internationally and function as the foundation for creating new content and innovations before the Tokyo 2020 Olympic and Paralympic Games, it is necessary to accelerate efforts under collaboration between the government, etc. and the "coordinators" that connect individual archive institutions.

The Council for Strategic Planning on Cultural Resources – which has organized the annual domestic event "Archive Summit" since 2015 – as well as other major groups that strive to develop digital archives/libraries in Japan, share the same interests and aims as the IPS-HQ.

4. Digital archives/libraries in Japan: Practicality

In this section, the author introduces several major programs and projects of digital archives in Japan.

The National Diet Library (NDL) of Japan (here, the National Diet means the National Congress) is the leading provider and manager of digital archives/libraries in Japan. The core of its digital archives/libraries program is the NDL Digital Collection (http://dl.ndl.go.jp/?__lang=en). This program consists of digitized materials of the NDL's traditional collections as well as online (born-digital) materials, based on its legal deposit system. However, while the NDL's Digital Collection contained 2,660,000 materials as of March 2018, 2,130,000 items (80%) are accessible at the NDL's buildings (some of them are also accessible in partner libraries) due to copyright limitations and other reasons; only 530,000 items (20%) are freely available on the Internet (National Diet Library (Japan), n.d.).

National archival institutions, which mainly deal with historical public records, also manage their own digital archives. A prominent system is the Japan Center for Asian Historical Records (JACAR) (https://www.jacar.go.jp/english/), which operates as a portal of digitized historical diplomatic and domestic records held by the National Archives of Japan, the Diplomatic Archives of the Ministry of Foreign Affairs, and the National Institute for Defence Studies of the Ministry of Defence. Nevertheless, JACAR's establishment in 2001 and ongoing management have largely come from and are supported by Japan's diplomatic policy – especially concerning Asian countries – rather than the cultural and industrial policy of the IP Strategic Program.

While the abovementioned programs by national libraries and archives contribute to the digital humanities and digital scholarship, there are several large-scale projects by Japanese academic institutions that establish digital archives/libraries as infrastructures of these new digital fields. The most well-known initiatives include the "Project to Build an International Collaborative Research Network for Pre-modern Japanese Texts" (also known as the NIJL-NW Project) by the National Institute of Japanese Literature (NIJL) (https://www.nijl.ac.jp/pages/cijproject/index_e.html). With a provisional endowment of 8.8 billion Japanese Yen (approximately 81 million USD and 69 million Euro as of the end of May 2018), which began in fiscal year (FY) 2014 and will run through FY 2023, the NIJL-NW Project will develop a comprehensive "Database of Pre-modern Japanese Works."[2] This database will include digital images from pre-modern Japanese books (Ihara, 2017). Another

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[2] The database is available at https://kotenseki.nijl.ac.jp/?ln=en .

aim of the NIJL-NW Project is to develop a research network with domestic and overseas universities and institutions for the digital humanities, not limited to pre-modern Japanese literature.

An additional important goal is to create a portal for the numerous, scattered contents of digital archives/libraries in Japan; the NDL will serve as the core institution for the portal. As mentioned earlier, in Japan, many government and public organizations, universities, researchers, libraries, museums and other entities have developed their own digital archives, each of each has functioned as an information silo, without interoperability. Many stakeholders in Japan, as well as the IPS-HQ, recognize that it is necessary to overcome the silo syndrome and create a one-stop portal for the country's digital archives/libraries. They see the European Union's Europeana (https://www.europeana.eu/portal/en), as well as the Digital Public Library of America (DPLA) (https://dp.la/), as role models for Japan's proposed portal. The NDL operated a prototype called PORTA (NDL, Digital Library Portal) from 2007 to 2012 [3] . The current effective NDL Search (http://iss.ndl.go.jp/?ar=4e1f&locale=en) is the successor to PORTA and includes a portal for several of Japan's digital archives, as well as a cross-search function for data found in books, journal articles, reference questions, and other useful library materials both within and outside NDL. However, NDL Search covers just the tip of the iceberg regarding the contents of Japan's digital archives/libraries. Rather, NDL Search functions as a kind of web-scale discovery service for cross-library collections in Japan.

In addition to NDL Search, the NDL plans to develop Japan Search (a tentative name) in the near future, as a counterpart of Europeana and/or DPLA and a comprehensive, one-stop portal for the country's digital archives/libraries.

5. Issues of digital archives/libraries in Japan

Based on the policy and practices described above, this chapter discusses the issues of digital archives/libraries as a potential infrastructure of the digital humanities and digital scholarship in Japan.

5.1 Sustainability

In the author's opinion, one of the biggest challenges facing digital archives in Japan is their sustainability in terms of budget, system replacement and data migration.

The typical pattern of the development and the obsolescence of digital archives, especially those created by university researchers in the humanities and social sciences, depend on competitive and time-limited funds. The most popular fund for Japanese researchers is JSPS KAKENHI: Grants-in-Aid for Scientific Research by the Japan Society for the Promotion of Science (JSPS). Besides the several funding programs for ordinary research projects, JSPS KAKENHI offers Grants-in-Aid for Publication of Scientific Research Results. Such grants consist of four categories (Japan Society for the Promotion of Science, n.d.):
    (1) Publication of Research Results (subsidies for academic societies).
    (2) Enhancement of International Dissemination of Information (subsidies for academic societies to publish international academic journal).

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[3] The URL of PORTA was http://porta.ndl.go.jp. The partially archived contents of PORTA are currently available on the Internet Archive Wayback Machine (https://archive.org/).

(3) Scientific Literature (subsidies for researchers to publish books or monographs).
(4) Databases (subsidies for researchers).

Type (4) is for the development and maintenance of academic databases open to the public and/or academic communities, including digital archives/libraries, but the grant period is limited to 5 years. JSPS does not manage databases for which the grant period has expired. What do researchers do at the end of a grant period? They have four choices:

(1) Apply for another Type (4) grant from JSPS or any other grant program with another title (the name of the database may be the same).
(2) Maintain the database at their own expense.
(3) Migrate the data to another system such as a university repository system.
(4) Give up maintaining the database.

Another solution is to create and publish the database on CDs or DVDs to avoid issues of maintaining Web servers and data.

The basic aim of JSPS KAKENHI, regardless of the type of grant, is to support a wide range of academic subjects. Currently, researchers in Japan are being forced to rely on competitive grants (such as those issued by JSPS KAKENHI) due to reduced ordinal research budgets at universities and research institutions. Therefore, while there are chances for researchers in minor research fields to develop their own databases with support from a Type (4) JSPS KAKENHI grant, the maintenance of the database is not ensured. Unfortunately, neither the author nor other researchers in Japan know the exact number and budgets of lost digital databases or archives once supported by JSPS.

The issue of funding is not limited to JSPS KAKENHI. Table 1 (Tokuhara, 2017: 1. Slightly modified by the author) shows the transition of the NDL's budget for digitization, which affects the amount of digitized materials available at the NDL Digital Collection. This transition suggests that financial support to the NDL's digitization has not been stable for a long time.

Table 1: Budget for the Digitization of the NDL Collection from 2010 to 2016

FY	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12
Budget* (ordinal)	100	150	220	240	120	40	220	80	130	130	130	0	0
Budget* (suppl.)										12,700	1,000		

FY	'13	'14	'15	'16
Budget* (ordinal)	20	20	50	110
Budget* (suppl.)		1,000		

(*Value: 1 million Yen)

There is also concern for big projects surrounding digital archives/libraries in the realm of the digital humanities. The NIJL-NW Project will be able to rely on a huge amount of money for 10 years from FY 2014 to FY 2023. However, in terms of budgeting, it is not clearly how the results of the project – a comprehensive "Database of Pre-modern Japanese Works" with digitally archived contents – will be maintained after the project period ends in FY 2023. As

discussed later, the "Database of Pre-modern Japanese Works" is prepared for possible long-term sustainability with open licensing/standards for the system of databases and digital archives/libraries.

5.2 Setting a deadline for commemoration: 2020

Another issue for Japanese policy is setting a deadline for the development of digital archives/libraries, which is 2020. This year will be referred to as "Tokyo 2020" and more concretely, "the Tokyo 2020 Olympic and Paralympic Games." This year has special meaning for the development of digital archives/libraries, as well as Japan's overall cultural policy, whereby the Japanese government and other stakeholders want to take advantage of this worldwide sports event to promote Japan's soft (i.e., cultural) power, as well as the physical prowess and sportsmanship of Japanese athletes. The 2012 Cultural Olympiad, which was held in the UK along with the 2012 London Olympic and Paralympic Games, serves as a role model for the Japanese government and relevant stakeholders (McKirdy, 2017).

As cited above, the 2017 version of the IP Strategic Program by the IPS-HQ views "the Tokyo 2020 Olympic and Paralympic Games" as the target deadline for developing digital archives in Japan. Furthermore, the Archive Japan Manifesto by the Council for Strategic Planning on Cultural Resources (2014) set the deadline of 2020 to showcase "our countries[sic] cultural resources," including (digital) archives:

> On the occasion of the 2020 Tokyo Olympics and Paralympics, when the eyes of the world will again be turned to Japan, so our success or failure to utilize the accumulation of our countries cultural resources will be tested.

However, there is concern that while 2020 is a definite deadline, the activities beyond that year are not clear. In other words, setting such a deadline would cause burnout among the stakeholders of digital archives/libraries and cultural sectors, as well as athletes and stakeholders in the field of sports.

The International Olympic Committee (IOC) and the International Paralympic Committee (IPC) – the respective governing bodies of the Olympic and Paralympic Games – have seen numerous scandals in recent years such as bribery, doping, cheating, harassment, and the huge debts of "legacy" buildings such as the Olympic Stadiums. It would not be surprising if people in Japan and around the world were disappointed by the real issues of the Tokyo 2020 Games both during and after the events. Several current troubles include disputes over the Olympic Stadium, cheating surrounding logos, and power harassment at the hands of coaches. As for sports and cultural archives, negative and positive aspects alike should be recorded and archived for investigation by future generations.

6. A possible solution: Open licensing

What will be needed to overcome the challenges surrounding digital archives/libraries in Japan, especially the issue of sustainability? From the author's perspective, a key step would be improving the licensing system. That is, in terms of licensing (the legal framework of IP), the method of retrieving and reusing data and/or contents should be considered, in addition to technical transitions (i.e., obsolescence).

Under the conditions of open licensing, the duties of managers and users may become less defined, or even switched. Currently, there are several practices and initiatives for user instructions on digital archives/libraries in Japan and worldwide, such as educational programs[4] and crowd sourcing activities (e.g., user-based transcription) (Ihara, 2017: 33-35). However, such user instructions assume a clear distinction between managers and users in the sense that users should not "hijack" digital archives/libraries from managers' control. Such differences might endanger the sustainability of digital archives/libraries once managers can no longer afford to maintain them, especially in terms of budget.

Therefore, licensing is critical; even if managers cannot maintain digital archives/libraries, under an open licensing system, which would allow a third party to use the system and/or contents, the users and/or user communities may create their own systems using the contents, or even "hijack" (or more politely, "hack") the system itself[5]. Of course, for a much more user-driven environment, there must be secure trust between managers and users, and among users and/or user communities.

The NIJL-NW Project adopted an open license for its "Database of Pre-modern Japanese Works," in addition to open standards for use of its databases and digital archives/libraries, such as the International Image Interoperability Framework (IIIF).

Another good example in Japan is Data.go.jp, an open government data portal that was temporarily shut down in the spring of 2014. Data.go.jp is a little different from the context of most digital archives/libraries; it served as the central portal of Japan's open government data starting in December 2013 and was suddenly shut down on April 1, 2014 because the portal was being managed on a trial basis at the time, and the budget expired on March 31, 2014, the end of FY 2013. Soon after the shutdown, Japanese users concerned about open data (not only government data) created an alternative site called datago.jp. This was possible because the open license was applied to the data on data.go.jp. Data.go.jp was re-opened in mid-May of 2014 thanks to the re-appropriation of the budget, and became an official portal in October that same year. (The alternative website, datago.jp, is no longer accessible.) This example shows that it is necessary to adopt open licensing for digital data systems and/or digital archives/libraries.

7. Conclusion: Issue-oriented strategies or extensive infrastructure for digital scholarship?

Overall, the policy, practices and projects of Japanese digital archives/libraries are based on issue-oriented strategies, as shown in the Archive Japan Manifesto and the government's IP Strategic Program. While such strategies could motivate several stakeholders, like the business technique of management by objectives (MBO), they may cause burnout and endanger the sustainability of digital archives/libraries. Rather, from the author's standpoint, it is necessary to set a long-term plan and budget to develop digital archives/libraries as a comprehensive and sustainable infrastructure, including the issue of licensing. This will help

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[4] One of the interesting practices regarding the educational use of both physical and digital archives is Teaching with/about Primary Sources (TPS), promoted primarily by the Society of American Archivists (Prom and Hinchliffe, 2016).

[5] The author is deeply grateful to Dr. Kiyonori Nagasaki, Senior Fellow at the International Institute for Digital Humanities (Tokyo, Japan) for the idea of open licensing, along with the relationship between managers and users.

develop the nascent fields of the digital humanities and digital scholarship, as well as new research rules and methods (e.g., crowdsourcing).

Finally, the policy, practices and projects of digital archives/libraries should reflect "Access and Opportunity for All: How Libraries contribute to the United Nations 2030 Agenda," a manifesto by the International Federation of Library Associations and Institutions (IFLA) (2016) for the sustainable development goals (SDGs) set by the United Nations. In sum, the sustainability of digital archives/libraries is a matter of the SDGs. Relevant policy, practices and projects should contribute to the sustainable development of the global economy, culture and society, and should not be limited to the survival of Japanese culture, IP, or the Tokyo 2020 Games.

Acknowledgments

References

Council for Strategic Planning on Cultural Resources (Japan). (2014). *Archives Japan Manifesto* (English version). http://archivesj.net/page-163/ [Accessed 2018-06-01].

Cumming, Kate. (2015). "Recordkeeping." In: Luciana Duranti and Patricia C. Franks, eds. *Encyclopedia of Archival Science* (pp. 319-323). Lanham: Rowman & Littlefield.

Cunningham, Adrian. (2008). "Digital curation/digital archiving: a view from the National Archives of Australia." *American Archivist*, 71.2, 530-543. https://doi.org/10.17723/aarc.71.2.p0h0t68547385507 [Accessed 2018-06-01].

Ihara, Hanae. (2017). *What Are the Challenges of Presenting Japanese Cultural Memory through Digital Archives?: the Potential of the Database of Pre-modern Japanese Works for International Japanese Studies*. Thesis for MA Librarianship, University of Sheffield (UK). https://dagda.shef.ac.uk/dispub/dissertations/2016-17/External/Ihara_H.pdf [Accessed 2018-06-01].

Intellectual Property Strategy Headquarters (Japan). (2017). *Intellectual Property Strategic Program 2017* (English version). https://www.kantei.go.jp/jp/singi/titeki2/kettei/chizaikeikaku20170516_e.pdf [Accessed 2018-06-01].

International Federation of Library Associations and Institutions. (2016). *Access and Opportunity for All: How Libraries Contribute to the United Nations 2030 Agenda*. https://www.ifla.org/publications/node/10546 [Accessed 2018-06-01. A Japanese translation is available].

Japan Digital Archives Association. (2003). *Digital Archives Project – Objectives and Significance*. (Archived as of Feb. 6, 2003.) https://web.archive.org/web/20030206080330/http://www.jdaa.gr.jp:80/prj/e-prj.htm [Accessed 2018-06-01].

Japan Society for the Promotion of Science. (n.d.). *Grants-in-Aid for Scientific Research <KAKENHI>: Types of Grants Programs*. https://www.jsps.go.jp/english/e-grants/grants01.html [Accessed 2018-06-01].

Koga, Takashi. (2015). "*Digital Archive no Kanousei to Kadai* [Opportunities and challenges for digital archives]." (in Japanese) In: Makoto Okamoto and Yoshio Yanagi, eds. *Digital Archive to ha Nanika [What is Digital Archives?]* (pp. 49-69). Tokyo: Bensei Shuppan.

Koga, Takashi. (2016). "How to fill the gap in the recognition of and education on digital archives? The situation in Japan and abroad." *4th Asia Pacific Conference on Archival Education*, Seoul, Korea, Sep. 5, 2016. https://doi.org/10.13140/RG.2.2.19448.65289 [Accessed 2018-06-01].

McDonald, John D. and Michael Levine-Clark, eds. (2017). *Encyclopedia of Library and Information Sciences*, 4th ed. Boca Raton: CRC Press.

McKirdy, Andrew. (2017). "Japan will deliver big during Tokyo 2020 Cultural Olympiad, London Games official says." *Japan Times* (Web edition), Mar. 9, 2017. https://www.japantimes.co.jp/news/2017/03/09/national/japan-will-deliver-big-tokyo-2020-cultural-olympiad-london-games-official-says/ [Accessed 2018-06-01].

Nagao, Makoto. (1994). *Denshi Toshokan [Digital Library]* (in Japanese). Tokyo: Iwanami Shoten. (A reprint was issued by the same publisher in 2010.)

National Diet Library (Japan). (n.d.). *Digitization of Library Materials*. http://www.ndl.go.jp/en/preservation/digitization/index.html [Accessed 2018-06-01].

Prom, Christopher J. and Lisa Janicke Hinchliffe, eds. (2016). *Teaching with Primary Sources*. Chicago: Society of American Archivists.

Theimer, Kate. (2015). "Digital Archives." In: Luciana Duranti and Patricia C. Franks, eds. *Encyclopedia of Archival Science* (pp. 157-160). Lanham: Rowman & Littlefield.

Tokuhara, Naoko. (2017). "*Kokuritsu Kokkai Toshokan ni Okeru Shiryo Dejitaru-ka no Jisshi Jokyo* [Current situations of the digitization of the NDL Collection]." (in Japanese) Presentation at the National Diet Library (Japan), Jun. 23, 2017. http://www.ndl.go.jp/jp/preservation/digitization/about_digital.pdf [accessed 2018-06-01].