

Trends in digital cultural heritage in Japan, 1980-2012

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In Japan, many different organisations have played a part in creating the digital content that we now see being shared on the internet. Starting in the 1980s, developments in digital cultural heritage took place mainly in five kinds of institution: museums, libraries, archives, university and research institutes, plus the world of business. Museums and libraries played a leading role in the 1980s, and they were joined in the 1990s by universities and commercial enterprises, which developed digital content in a variety of ways. In the 2000s archival institutions became involved, and museums, libraries and archives began to form networks to enable seamless retrieval of digital cultural heritage. In the 2010s, the focus moved to the sharing of data and specifically the need to establish a common approach for the exchange of metadata for the ‘Semantic Web’. Creating content for tablet devices also became important, as did the question of standardising technology. The Great East Japan Earthquake of 2011 brought a keen awareness of the need to create digital records to preserve and share memories of disasters.

What is digital cultural heritage?

In this paper I use the term digital cultural heritage to refer to digital reproductions of all forms of art and craft, books and other written materials, and much else, that are stored in various formats and use a variety of technologies for their preservation and dissemination. In Japan, people sometimes refer to this kind of digital content as ‘digital archives’, using the Japanese version of the English term (*dejitaru ākaibu*); and ‘digital archives’ and ‘digital cultural heritage’ often appear to be almost interchangeable. This may be related to a rather broad understanding of what the English word ‘archives’ signifies, but it may also reflect a wider reality – that some of the digital archives currently being created are indeed a kind of cultural heritage.¹

Many different kinds of organisation have played a role in creating and developing digital cultural heritage in Japan, starting in the 1980s. The advances have taken place in five main fields: museums, libraries, archives, university and

research institutes, and private enterprises.

The national museums began developing digital content in the 1980s: the Tokyo National Museum, the Kyoto National Museum, and the Nara National Museum, the National Museum of Ethnology, the National Museum of Japanese History, and others, all constructed databases for the purpose of information management and digitised their collections of visual material. In the 1990s, the National Museum of Western Art started developing digital content for use in its exhibitions, in displays which made use of high-definition film and kiosk terminals.²

Universities and research institutes too engaged in the construction of databases and systems for storing materials related to cultural resources, helped by public funding awarded by the Ministry of Education, Science and Culture (now the Ministry of Education, Culture, Sports, Science and Technology) and Grants-in-Aid for Scientific Research. Advances were made in the computer sciences in the development of databases for all sorts

of purposes, in display technology, in improving input devices for digitising documents, and in 3-D graphics.

Digital cultural heritage in the 1990s and 2000s

The 1990s saw computers become common items in almost every household, and progress was also made in their use in institutions involved in preserving and sharing cultural resources. In 1996 Yoshio Tsukio, then a professor at the University of Tokyo, proposed the English term 'digital archives' to refer to sites that share digital content from various cultural resources, and the Japan Digital Archives Association (JDAA) was set up by government ministries and public organisations.³

Amidst all these new developments, even more projects were undertaken in every field during the 1990s and the first decade of the 21st century. Both public and private museums, including the national museums that belong to what is now called the National Institutes for Cultural Heritage,⁴ together with the National Museum of Art⁵ and the institutes in the inter-university research body known as the National Institutes for the Humanities,⁶ began digitising their collections, putting them on databases and sharing them. The Kyūshū National Museum,⁷ which opened in 2005, started holding innovative exhibitions that made use of the possibilities of virtual reality. In tandem with these developments, the larger museums published digital collections of thematically linked material, databases put together by their affiliated researchers, lists of their researchers, and other types of information.⁸ Larger libraries such as the National Diet Library, and other public, private and university libraries, began to create digital reproductions of the rare books and historical documents in their holdings, and make them available for browsing. In 2002 the National Diet Library's Kansai-Kan ('Kansai Library') opened, in Kansai Science City, Kyoto Prefecture, and efforts were directed towards the digitisation of the NDL's collections and towards their long-term storage. Numerous images of works held by the NDL were made available for viewing in its Online Gallery.⁹

In the latter half of the 1990s, universities and research institutes became actively engaged in the digitisation of cultural resources. Ritsumeikan University established an Art Research Center¹⁰ and started to promote the discipline of 'Digital Humanities' in Japan, with the idea of investigating

the relationship between digital technology and research in the humanities.¹¹ Dōshisha University established a Faculty of Culture and Information Science. Kyoto University made various rare materials available on the web, including the *Kunijo Kabuki Ekotoba*, a beautifully illustrated manuscript that shows the beginnings of kabuki, dating from the Edo period (1603-1868).¹² The Research Institute for Digital Media and Content at Keiō University continued to look into ways of creating digital cultural heritage relating to visual material,¹³ producing, among other things, digital collections of past TV commercials.¹⁴ The Digital Archive Research Centre at Keiō University began to make a digitised version of the Gutenberg Bible.¹⁵ At the Research Centre for the Arts and Art Administration, again at Keiō University, a project was initiated to preserve resources relating to Tatsumi Hijikata, a celebrated practitioner of Butoh dance.¹⁶ At Osaka City University, researchers put together the Shōsōin Monjo Database, a database of Japan's oldest collection of art objects in the treasure house affiliated to the Tōdaiji Temple in Nara.¹⁷ At the University of Tokyo, digital collections were made of material which had been put together by anthropologists and historians of early forms of news media.¹⁸

At the National Institute of Informatics, the Digital Silk Road project was initiated.¹⁹ The National Museum of Ethnology put together a digital collection entitled 'Chronology of Clothing Culture in Japan 1868-1945'.²⁰ The reports and findings of all these projects were presented at various international symposia and conferences, and in study groups and meetings of the Information Processing Society of Japan.²¹

Meanwhile, the National Institute of Japanese Literature started digitising its archives.²² In 2001 the Japan Center for Asian Historical Records, at the National Archives of Japan, made digital versions of documents relating to World War II that had belonged to the former army and navy ministries, making them available to the public.²³ In rural areas, public libraries, museums and archives also began to digitise their collections of cultural heritage.

In 2005 the National Archives of Japan published a Digital Archive (the National Archives of Japan Digital Archive), providing access to the descriptions and digitised images of its historical records.²⁴ The Japan Society for Archival Science was set up in 2004, and much progress was made in research into the field of records and archives management.²⁵

The 1990s also saw commercial companies join in

the digitisation of cultural material, making many collections on CD-ROM and other formats available for sale. The early 2000s saw the initiation of some large-scale projects: Toppan Printing Co. Ltd. photographed cultural assets and their locations in countries around the world and reproduced them as 3-D motion pictures, which it showed in 'Virtual Reality Theatres' set up in several museums in Japan.²⁶ Dai Nippon Printing started a collaborative venture with the Louvre Museum, setting up a 'Louvre-DNP Museum Lab' in Tokyo that used various digital technologies in exhibitions centering on art works in the Museum's collections.²⁷ Japan's national public broadcasting channel NHK set about creating its own archive of TV and radio programmes and recordings, the NHK Archives,²⁸ and other newspaper companies and news agencies in Japan began digitising images published in past issues, and selling them online.²⁹

Corporations such as Waseda System Development Co. Ltd.,³⁰ Kosaido Co. Ltd.,³¹ and Infocom Corporation³² developed various systems for information management, and started to engage in business online. Other companies such as Nissha Printing Co. Ltd.,³³ Horiuchi Color Ltd.³⁴ and kmsym.com³⁵ started up businesses for libraries, museums and galleries in areas such as film processing and digital photography. My Book Service Inc.³⁶ began selling award-winning databases containing information about the cultural resources available from retailers. US-based corporations such as Google extended schemes like the Google Books Library Project³⁷ and the Google Art Project³⁸ to include collections from Japan.

These developments were accompanied by others that focussed on networks between institutions. The website Cultural Heritage Online,³⁹ a collaborative endeavour by the Agency for Cultural Affairs⁴⁰ and the National Institute of Informatics,⁴¹ was officially launched in 2008. This website's database records information on sites and artefacts of cultural heritage submitted by various organisations nationwide, providing a system for seamless retrieval of information that transcends what is held by any individual organisation. Another website, Imagine, also developed by the National Institute of Informatics, allows users to make cross-site keyword searches of the holdings of several institutions at once.⁴²

Meanwhile, the National Diet Library constructed a digital archive web portal called PORTA, with a system that allowed cross-searching of databases of library, museum and archive holdings, both in Japan and other countries. In 2012 this system was subsumed into the search service

NDL Search, which enables single-platform searching of digital cultural heritage in all three types of institution. It also enables cross-site retrievals of all types of information resource, such as books and theses.⁴³

In 2009 a symposium was held to mark the 20th year of the Japan Art Documentation Society (JADS),⁴⁴ which since 1989 has led the way in collaborations between museums, libraries and archives in Japan. The symposium provided an opportunity to report on developments and achievements among libraries, museums, archives, research institutes and businesses. At this symposium, tripartite talks were held between the National Institutes for Cultural Heritage, the National Diet Library and the National Archives of Japan, and the importance of collaborative ventures between museums, libraries and archives was recognised.⁴⁵

Trends in the 2010s and the Great East Japan Earthquake of 2011

The 2010s saw continued developments in creating digital cultural heritage. One big change was the diversification of platforms. 'Smartphones' proliferated in Japan as elsewhere, and many more people used them to browse content. This was when Apple's iPad hit the markets, and tablet devices also came into wide use. Several museums produced collections of images of art works with explanations specifically for use with such devices: the iPhone application 'e-Museum', which gives access to national treasures and important cultural properties in Japan's national museums, is one example.⁴⁶ Commercial enterprises also put out digital content, both fee-paying and free of charge, targeted at the iPad and iPhone. Representative examples are the collection of digital images made of the art treasures belonging to the Hosokawa family;⁴⁷ the collection of images of artworks in the Louvre Museum which guides users electronically around sculptures;⁴⁸ digital collections of old maps;⁴⁹ digital collections of the letters of historical figures;⁵⁰ digital collections of *e-maki* picture scrolls,⁵¹ and other collections of digital images of various types of cultural property.⁵²

In tandem with these developments, recognition spread in Japan of the value of e-books, which started being published in even greater numbers. As a result, in addition to allowing users to read digitised versions of rare texts and older, out of copyright books, some libraries began to permit members to browse electronic versions of books that

are still in copyright, so long as this was done on-site at the holding library. Because of this, libraries now find themselves having to handle quite complex differences in digital content: digital content with no copyright restriction or where the copyright restriction no longer applies, and also digital content where such restrictions do still apply.

In view of this complexity, the Japanese Government set up a 'Council for the Promotion of Utilisation of Publications in a Digital Network Society', led by the Ministry of Internal Affairs and Communications, in which a number of working teams looked into possible future directions for e-publications and the digital cultural heritage, and proposed appropriate guidelines.⁵³ The University of Tokyo launched an educational programme in Digital Humanities, which began in 2012, with a similar aim in mind, that of encouraging the involvement of people of talent in digital cultural heritage.⁵⁴

The Great East Japan Earthquake that struck on March 11, 2011 had a profound impact on trends in digital cultural heritage. Soon after the disasters, a wiki called saveMLAK was set up with the purpose of gathering information about damage to the museums, libraries, archives and community centres (*kōminkan*) that had been affected by the earthquake and subsequent tsunami.⁵⁵ Video content on the tsunami was collected on Youtube and other video-sharing websites.⁵⁶ The leading search engine site Yahoo Japan Corporation set up a website called 'The East Japan Earthquake Picture Project', encouraging people to share images and video footage of the earthquake-stricken areas before and after the disasters.⁵⁷ Google Japan did the same with a site called 'Mirai e no kioku' (Memories for the Future).⁵⁸ The National Research Institute for Earth Science and Disaster Prevention (NIED) initiated a site called '311 Marugoto Archive' ('All 311 Comprehensive Archiving Project'), which offers an e-community platform for users' images and video relating to the earthquake and the disasters that followed.⁵⁹ In September 2012 the Edwin O. Reischauer Institute of Japanese Studies at Harvard University opened a public version of its Digital Archive of Japan's 2011 Disasters, aimed at developing a collection of online websites and resources related to the earthquake and its aftermath in Japan.⁶⁰ NHK too released its NHK Archives on the Great East Japan Earthquake, which includes testimonials from witnesses and victims.⁶¹ This prolific activity in the creation of online archives of the disasters inspired the National Diet Library to announce the commencement of a comprehensive portal site titled 'The NDL Great East Japan

Earthquake Archive', with the intention of gathering all these archives relating to the disaster in one place to enable seamless retrieval.⁶² The disaster has led to a consideration of how to archive visual materials such as photographs, digital images and video. It has also given rise to the question of the relationship between the networks that have been established and the creation of digital cultural heritage, and the implications of the effect each has upon the other.

Issues for the future

Up to this point, I have traced the main developments in the creation of digital cultural heritage in the past. I will now outline some important issues for the future. One of these is the question of what kind of collaborations might be engaged in, particularly with business. Another question is what kind of international collaborations should be aimed for. More and more amateurs are uploading their images to commercial websites that feature photographs and video recordings. We should consider what kind of status we want to accord such websites as part of the digital cultural heritage. A further question concerns the sharing of resources for research. Many museums are sharing materials that are of interest to the general public; but how are they publicising the material needed by researchers, for example the archives of research material in their collections? Will they digitise those materials and archives, and if so, how?

Other issues surround the matter of the compatibility of semantic metadata such as RDF with that currently used in databases. A considerable advance was made in semantic technology for museums and researchers in cultural heritage with the development of 'LODAC Museum', an extension of the infrastructure known as LODAC (Linked Open Data for Academia), which allowed for the sharing of artwork metadata using RDF. Nevertheless, we still need to consider how we can publicise and increase use of this type of metadata more widely.⁶³

A thorough understanding among library specialists and information management professionals of the universal descriptive metadata necessary for the preservation and management of digital data, as well as its continuous management and transmission into the future, will be essential. All sorts of digital cultural heritage have been created in Japan. Proposals have already been made for specific metadata schemes, and models for metadata terminology for recording information such as creator/author, date of compilation,

information pertaining to rights holders, etc. The National Diet Library has already posted its own metadata terms, which match the Dublin Core and PREMIS metadata standards, on the internet.⁶⁴ The University of Tokyo has published a handbook with the recommended terminology.⁶⁵ Even so, at present, the question of how we are going to manage all these different kinds of metadata remains an issue.

There is also the challenge of ever-changing platforms. As already stated, PCs are steadily being replaced by a multiplicity of personal devices, operating systems are also being upgraded, and 'plug-ins' added, and content that was made using previous technologies such as CD-ROM, for example, can now often end up as unreadable. We should consider ways in which we can 'rescue' digital content that has become inaccessible to new environments.

The above is an outline of the transformations in digital cultural heritage in Japan from 1980 up to the present. In Japan, digitisation of cultural heritage has been carried out in the five kinds of organisation mentioned earlier, but since the 1990s more and more calls have been heard, usually in the context of academic conferences, for the creation of networks between museums, libraries and archives, and opportunities are increasing for the exchange of information between these bodies. In recent years, such collaboration has become necessary not only among public institutions but between companies in the business world as well. Our most important issues today are surely the creation of new platforms that help with the networking of information, and the fostering of people of talent who can take a part in this process.

References

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http://www.kyohaku.go.jp/eng/index_top.html.
Nara National Museum,
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National Museum of Ethnology,
<http://www.minpaku.ac.jp/english/>.
National Museum of Japanese History,
<http://www.rekihaku.ac.jp/english/index.html>.
National Museum of Western Art,
<http://www.nmwa.go.jp/en/>.
3. <http://www.dcaj.org/jdaa/index.htm>.
4. <http://www.nich.go.jp/english/index.html>.
5. <http://www.artmuseums.go.jp/>.
6. <http://www.nihu.jp/e/index.html>.
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<http://htq.minpaku.ac.jp/databases/mcd/chronology-eng.html>.
9. <http://www.ndl.go.jp/en/gallery/index.html>.
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12. <http://edb.kulib.kyoto-u.ac.jp/exhibit-e/index.html>; see also the collections of material (photos, film, field notes, seminar proceedings, lecture notes, original texts, etc.) in Kyoto University's Research Resource Archive at <http://www.rra.museum.kyoto-u.ac.jp/>.
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