

Who Moved My Masterpiece? Digital Reproduction, Replacement, and the Vanishing Cultural Heritage of Kyoto

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Abstract

In many temples in and around Kyoto, sets of wall and slide door paintings and folding screen paintings, which are designated either national treasures or important cultural properties of Japan, have been replaced in situ by high-quality digital reproductions. The original paintings, in turn, are now largely out of sight, placed in storage spaces within temples and museums. Vanguard projects of this nature were conducted in the mid-1990s. Since the mid-2000s, however, and without adequate review of the merits and demerits of such replacement, the practice has accelerated, and numerous sets of slide door paintings have been replaced by reproductions produced for the most part by two competing corporations. The process and implication of such digital replacement require far greater attention and discussion than has to date taken place. Accordingly, this article seeks to clarify the current status of, and problems arising from, the digitization projects taking place in and around Kyoto.

Introduction

Since the mid 1990s, numerous Buddhist temples located in and around the city of Kyoto, Japan, have replaced treasured sliding door paintings (*J. fusumae*), wall paintings (*hekiga*), folding screen paintings (*byōbue*), hanging scroll paintings (*kakemono*), and illustrated manuscripts (*emaki*), dating from as early as the thirteenth to fourteenth centuries, with high-quality digital reproductions. With these digital copies on display, the original works, many designated by the Japanese government as National Treasures and Important Cultural Properties, have been consigned to out-of-sight storage spaces on the grounds of their temple owners or in national and private museums. In this article, I refer to this practice as “digital replacement.”¹

Projects to digitize cultural properties have spread globally with an almost dizzying speed, and numerous museums and other institutions have made images of their collections available to the public as part of Internet society. For instance, more than 3,000 institutions across

¹ In this paper, “replacement” implies the installation of reproductions in lieu of non-portable original works owned by a given site.

Europe contribute the Europeana, the EU-based online resource search system.² In February of 2017, the Metropolitan Museum of Art, New York made 375,000 collection images freely available to the public under the Creative Commons License Zero.³ Among three-dimensional modeling projects are various leading-edge trials focused on UNESCO world heritage sites such as the Digital Michelangelo Project (Stanford University), the Great Buddha Project (The University of Tokyo), and the Angkorian Temples Project (ETH Zurich).⁴

While these projects simply acquire digital data and transform it into another form of representation, digital replacement projects are categorically different and have radically dissimilar impacts on cultural properties and their social/historical contexts. Unlike the creation of scholarly and open access digital image databases, leaving objects *in situ* and modeling sites, digital replacement is conducted specifically to remove original objects from their sites and from the public gaze.

Digital replacement in Kyoto has occurred most often with sliding door and wall paintings, works that are intrinsic to specific Buddhist temple buildings and their surrounding garden spaces and are, in a word, “un-detachable” in terms of their inherent importance to specific ritual, spatial, aesthetic, and historical-cultural contexts. A vanguard project of this type was conducted in the mid 1990s at the subtemple Sanbōin within the monastery Daigoji. Since the mid 2000s, two competing corporate-based projects—one branded “Tsuzuri” (referred to in English as the “Cultural Heritage Inheritance Project”) and directed by Canon Inc., Japan and the other branded “Denshōbi” (“Transmitting the Beauty of Ancient Artisans”) and directed by Dai Nippon Printing Co. Ltd. (hereafter DNP)—have replaced numerous sets of *fusumae* and other works.⁵ As of this writing, the two projects have replaced works of sliding door painting and Buddhist painting (*butsuga*) with digital copies at six temples located in Kyoto Prefecture (Table 1).⁶

² <http://www.europeana.eu/> (accessed April 4, 2017).

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<https://www.nytimes.com/2017/02/07/arts/design/met-museum-makes-375000-images-available-for-free.html> (accessed April 4, 2017).

⁴ Brief descriptions of these projects are found in Gomes et. al., “3D Reconstruction Methods for Digital Preservation of Cultural Heritage: A Survey”

⁵ Tsuzuri, <http://canon.jp/tsuzuri/>; Denshōbi, <http://www.dnp.co.jp/denshoubi/> (accessed April 4, 2017).

⁶ The temples are: Jukōin, within Daitokuji; Jishōji; Ken'ninji, Entokuin within Kōdaiji; Ikkyūji (Shūon'an); and Tenkyūin within Myōshinji. Additional temple digitization projects, conducted by agents other than Canon and DNP, have focused on programs of sliding door and wall paintings at the abbot's quarters at Sanbōin at Daigoji, Nanzenji, Tenjuan at Nanzenji, and Kangakuin at Onjōji (all of them dating to the sixteenth-eighteenth centuries and designated Important Cultural Properties of Japan).

The news media in Japan and abroad has generally cast these digitization projects in a favorable light. Scholars in art history and museum curators, meanwhile, have for the most part exhibited marked reluctance to review them in a critical manner.⁷ There appear to be several reasons for such reticence. First, many scholars and curators hesitate to probe the management, technical processes, and implications of these projects because they are supervised by senior scholars who wield considerable authority in the discipline of art history in Japan. Second, particular scholars and curators may not want to jeopardize their relationships with temple owners upon whom they often depend for access to temple owned artifacts for research and exhibition.⁸ For these reasons, temple painting digitization projects have taken place in the absence of careful and broad-based review of their merits and demerits. This article seeks to clarify the current status of and problems inherent in these digital replacement projects and to propose points for future discussion.

Merits of and Concerns About Digital Reproduction and Replacement

The importance of digitization to the reproduction of particular types of cultural property is undeniable, and there are clear merits worth noting. In contrast to time-consuming and material-demanding manual reproduction, digitization generally allows for lower-cost, rapid, and higher-quality reproduction. Once a work has been digitized, moreover, it is possible to produce new reproductions from properly stored data. A new copy can therefore be made to replace an earlier, faded or damaged reproduction. Digitization also permits the production of multiple, simultaneous copies.

Each of the digitization projects carried out in Kyoto has so far deliberately eschewed this latter practice. Nevertheless, the companies that have been involved with these projects have sought to commoditize the digitization of cultural properties.⁹ Put simply, there are no *technical* obstacles to the production of full-scale, high-quality digital reproductions of cultural properties for sale as luxurious interior decoration or the like. Digital data has also been used to create web content for temple institutions. In the case of Daijōji in Hyogo Prefecture, famous for the 165

⁷ An exception is Levine, “On Return.”

⁸ Because media corporations in Japan such as The Mainichi Newspapers Co., LTD. and The Asahi Shinbun Co. frequently co-sponsor exhibitions, they tend to have a vested interest in maintaining good relations with temple owners of cultural properties. One cultural affairs reporter confessed to me that it would be quite difficult to write an article that was critical of temple digitization projects.

⁹ Artéfactory Inc., for example, produces for commercial sale or rental digital reproductions of various paintings. <http://www.artefactory.co.jp/> (accessed April 4, 2017).

wall and sliding door paintings by Maruyama Ōkyo (1733-1795)¹⁰ and his atelier that decorate its Guest Hall (*kyakuden*), image data produced by DNP during its digitization project has been repurposed in the temple's "Digital Museum" website.¹¹ The website's use of digital data to create online virtual, zoom-able representations is remarkably effective in evoking the Guest Hall's sumptuous architecture and painting programs.

Next, let us consider the merits of digital replacement. First of all, a temple that has replaced its original works with reproductions—the originals being placed in storage—can avoid the serious threats to cultural properties presented by fire, defacement, and theft. If the original works are deposited in a national museum and placed under its curatorial and conservation management, the temple is further freed from the direct responsibility of preservation. One can well imagine a temple's abbot or abbess fearing for the possible loss of cultural properties during his or her tenure, and we should not therefore unconditionally blame him or her for agreeing to the replacement of original works with nearly original-looking digital copies. In terms of national cultural properties administration in Japan, meanwhile, we should note that the Agency for Cultural Affairs (Bunkachō; ACA), an affiliated agency of the Ministry of Education, Culture, Sports, and Science and Technology (Monbukagakushō; MEXT), actively recommends the shift of designated cultural properties from *in situ* environments into museum storage and subsidizes the construction of storage facilities. For these museums, it is an honor to receive on extended loan National Treasures and Important Cultural Properties, which are available to their curatorial teams for permanent and temporary exhibition. Replacement, in short, can fulfill the needs and policies of both temple owners and national cultural property administration. To the extent that this remains the case, digital replacement projects will undoubtedly continue.

Despite the merits of the digital reproduction/replacement of cultural properties in specific terms and circumstances, greater attention should be paid to the particular processes, results, and implications of full-scale digital replacement. Two technical issues complicate such projects. First, with current technology it is not yet possible to make copies that are exact in appearance to aged originals as they are viewed within their native environments. In the process of digital reproduction as it is now carried out, engineers typically match data-generated images with the color of *in situ* originals under conditions of standardized light. In the particular, and changing, lighting conditions of the installation environment, however, the color of the copy will diverge from that of the original because of the different spectral signatures of natural pigments

¹⁰ Japanese names in this article appear in the order family name first, given name second.

¹¹ DNP digitized sixty-three wall and sliding door paintings. See <http://www.dnp.co.jp/denshoubi/works/fusuma/d02.html>. The "Daijyōji Temple: Digital Museum of the Maruyama School" can be found at <http://museum.daijyōji.or.jp/> (accessed April 4, 2017).

(original work) and artificial inks (reproduction). A match under standardized light does not guarantee a match in the temple environment. In addition, the varying color temperatures of natural lighting differentiate the appearance of the originals and digital reproductions from hour to hour. Meanwhile, if, in trying to avoid the predicament of an “exact match” between original and copy, a project supervisor chooses to reproduce the originals in a hypothesized future condition (or in a conjectural reconstruction of the appearance at the initial date of completion in the past) the results are likely to provoke considerable controversy from many scholars as well as the general public.¹²

Even more difficult in technical terms, and therefore controversial, is the reproduction of the copious gold leaf and gold pigments that appear frequently on late medieval and early modern wall and sliding door paintings. Since modern ink-jet printing technology cannot replicate the particular reflective qualities of gold, technicians have been forced to adopt a number of less than satisfactory methods: a) print imagery of gold leaf onto which pictorial imagery is in turn printed; b) apply actual gold leaf and print digital imagery upon it; c) print pictorial imagery and then apply actual gold leaf. In general, digitally reproduced gold leaf fails to capture the subtle present-day tonalities of such original materials, which develop over centuries of exposure to light and air. Despite the technical difficulty that gold leaf and pigment presents to digitization, it is notable that replacement projects tend to focus on cultural properties that employ these materials. One might surmise that the choice to digitally reproduce these paintings is based on a desire to draw the attention of the general public to such visually glamorous cultural properties.

A second technical problem arises from the simple fact that digital copies begin to fade from the moment of their completion and installation. Moreover, the nature of this fading differs from that undergone by original works *in situ* and when placed in storage. Often digital copies appear to fade far more rapidly than expected. Ironically, it may be necessary to develop specific conservation methods for digital reproductions. Despite evidence of such deterioration, there is has been little effort to scientifically monitor and evaluate the conditions of digital reproductions.

Trends in Digital Reproduction and Replacement

The vanguard digital replacement project in Kyoto, taking place in the mid 1990s, was the duplication and replacement of seventy-two wall and sliding door paintings completed by the

¹² For the reasons indicated earlier, negative opinions regarding such choices are generally not brought to the fore by scholars and curators. Bloggers have pointed out the deficiencies of the digital copies at Daijōji, a topic I address below. See, for instance, “Daijōji: Ōkyo no kūkan,” *Arts Calendar*, <http://www.arts-calendar.co.jp/WADA/09/okyo.html> (accessed April 4, 2017).

workshop of Hasegawa Tōhaku (1539-1610) and Ishida Yūtei (1721-1786), designated Important Cultural Properties, which decorated the Omote Shoin building at Sanbōin, Daigoji.¹³

Undertaken by the Nissha Printing Co., Ltd., the digital copies were printed on anomalously smooth paper, a choice dictated by technical limitations of the time. Nevertheless, the reproductions were highly mimetic to the original paintings. Most general viewers would not be able to distinguish them from the original paintings unless they happened to view the copies in close proximity and recognized what are unnatural paper joints and the unusually slick surface of this type of paper.¹⁴ During the brief guided tours that the general public may join, such close observation is all but impossible, however, and save for their occasional exhibition at Daigoji's temple museum, the Omote Shoin paintings have been kept out of sight in storage.

The rapid corporate development of imaging technology from the 1990s into the new millennium accelerated digital image acquisition and the related utilization of cultural properties in both Japan and abroad. In 2000-2003, the Tokyo-based Toppan Printing Co., Ltd. digitized works by Sandro Botticelli (ca. 1445-1510) in the Uffizi Gallery, Florence, including *Primavera* (ca. 1482) and *The Birth of Venus* (ca. 1483).¹⁵ Some of these full-scale digital replicas were then included in the special exhibition, "Digital Technology and the Museum: Public Seminars and Exhibitions of Information and Equipment Related to Digital Technology and the Arts," held at the National Museum of Western Art, Tokyo, from November to December, 2001.¹⁶ Before 1997, Hitachi Ltd. had begun to develop its Digital Image System, a total image processing system mainly for the reproduction of cultural properties.¹⁷ Hitachi then acquired the digital data of a number of famous paintings of Uffizi Gallery, and exhibited and sold replicas at Tokyo National Museum in 2007.¹⁸ In both instances, these projects aimed to establish the digitization of cultural

¹³ Paintings in the Upper rooms of the building, depicting *Willows of the Four Seasons* are attributed to the workshop of Hasegawa Tōhaku, while paintings of *Peacocks and Cycads* in the Lower Room were completed by Ishida Yūtei.

¹⁴ Present-day visitors to Sanbōin do not find notices indicating that the Omote Shoin rooms display digital copies. On two occasions, guides who lead tours of the building (one cannot view the rooms on one's own) did not volunteer the fact that the original paintings have been replaced and only confirmed that fact when I directly asked them about the replacement project. In their responses, they emphasized that the digital copies are identical to the original paintings.

¹⁵ Toppan Co., Japan, "Kichō na runessansu geijutsu no dejitaru ākaibu jigyō," http://www.toppan.co.jp/archives_news/article0004.html (accessed April 19, 2016).

¹⁶ "Past Exhibitions," *The National Museum of Western Art*, <http://www.nmwa.go.jp/en/exhibitions/past/p2000.html#2001> (accessed April 4, 2017).

¹⁷ Kamiuchi et al., "Digital Image System (DIS) no kaiatsu to sono ōyō."

¹⁸ Hitachi's Digital Imaging System, http://www.hitachi.co.jp/products/it/globalsolution/digitized_paintings/global/ (accessed April 19, 2016).

properties as a new resource but did not replace original works with digital copies.

In terms of the wider range of art reproduction in Japan during this period, we might also note the remarkable Ōtsuka Museum of Art, inaugurated in 1998, in Tokushima Prefecture.¹⁹ The museum's huge complex (29,412 square meters in total floor area) displays thousands of reproductions of works of Western art printed on ceramic boards (*tōban*). Although the copies were produced using a silver halide photographic process rather than digital data and printing, the project merits attention for its scale and concept of reproduction. Visitors are presented with full-scale copies of canonical works of Western art including the paintings of the Vatican's Sistine Chapel and the Scrovegni Chapel, Padua; Leonardo da Vinci's (1425-1519) *The Last Supper* at Santa Maria delle Grazie (in both pre- and post-restoration conditions); and Pablo Picasso's (1881-1973) *Guernica*. Developed by the Ōtsuka Ohmi Ceramics Co., Ltd., the ceramic print reproduction process has a number of limitations, including only a moderate spectrum of color reproduction, the rough surface texture of the ceramic boards, and the inevitable segmentation of large compositions that require printing across multiple boards.²⁰ The principle advantage of this reproduction process is durability.²¹ In any case, despite its rather isolated location (125 kilometers from Osaka) and its display of reproductions rather than original works, the museum attracts some 220,000 visitors annually. The museum reminds me of André Malraux's (1901-1976) "Le Musée imaginaire,"²² it presents one answer to the question of the museum in the age of copy technology.

One of the more impressive galleries within the Ōtsuka Museum of Arts contains copies of Michaelangelo's (1475-1564) paintings for the Sistine Chapel, a space that was reproduced digitally in 1998 by Toppan Printing Co., Ltd. In the latter case, we should note the interactive virtualization produced by the company using virtual reality (VR) technology.²³ Using the three-dimensional data it had acquired from the interior of the Sistine Chapel, Toppan virtualized the space on a 500-inch curved screen. Using a device similar to a video game controller, viewers

¹⁹ Ōtsuka Museum of Art, <http://www.o-museum.or.jp/english/> (accessed April 4, 2017).

²⁰ For technological reasons, the largest size board size is 3.0 m. x 0.9 m. Ōtsuka Ohmi Ceramics Co., Ltd., <http://www.ohmi.co.jp/en/product/> (accessed April 4, 2017). For an outline of the process, see <http://www.o-museum.or.jp/english/publics/index/17/> (accessed April 4, 2017).

²¹ The museum and maker claim that the ceramic print-based reproductions will "last for more than 2,000 years." <http://www.o-museum.or.jp/english/publics/index/16/> (accessed April 4, 2017).

²² Malraux predicted that copy technology would transform the appreciation and possession of art works. "Le Musée imaginaire" is translated as "Imaginary Museum" or "Museum without Walls." Malraux, *Le Musée imaginaire*.

²³ A brief description appears in "Toppan Virtual Reality," http://www.toppan-vr.jp/bunka/en/content_works.shtml (accessed April 4, 2017).

can virtually walk inside the chapel and “fly” up to the ceiling to closely observe Michelangelo’s paintings. Compared with the ceramic print reproduction in the Ōtsuka Museum of Art—which is analog-based, viewed in real scale, and is materially tangible—Toppan’s Sistine Chapel VR is fully digital, scalable, and intangible. In both instances, however, the existence of the reproductions does not displace the original work. It is perhaps obvious, but still bears emphasis, that the experience of seeing original paintings within their original architectural contexts, such as Michelangelo’s Sistine Chapel compositions, is not fully replaced by either the Ōtsuka tangible or Toppan intangible reproductions.

This brings us back to the practice of digitization followed by the *in situ* replacement of original paintings with digital copies, a practice that became increasingly common in and around Kyoto from 2006 onward. In 2006, the Kyoto International Culture Foundation (KICF; Kyoto Kokusai Bunka Kyōkai) and Hewlett-Packard Development Co. Japan (HPJ) collaborated on the production of digital reproductions of the Buddhist paintings of the *Five Wisdom Kings* (*Godai sonzō*) owned by Daigoji and designated National Treasures; Kanō Tan’yū’s (1602-1674) four sliding door paintings of *Tigers* (*Gunkozu*) owned by the monastery Nanzenji and designated Important Cultural Properties; and four sliding door paintings of *Katata Village* (*Katatazu fusumae*) attributed to Tosa Mitsunobu (ca.1434-ca.1525) and owned by the Seikadō Bunko Art Museum, Tokyo but painted originally for the subtemple Zuihōin within Daitokuji.²⁴ It should be noted that the digital reproductions of the *Katata Village* paintings, which were exhibited at “Artexpo New York” on March 2-6, 2006, “returned home” to the temple Zuihōin, where they were installed in the location of the original paintings, which remain in the collection of the Seikadō, Tokyo.²⁵

Following these projects, the Kyoto International Culture Foundation shifted its corporate affiliation from Hewlett-Packard to Canon, Inc., and in 2009 it was restructured as a non-profit organization named the Kyoto Culture Association (KCA). Since then the KCA and Canon have continued digitization and digital replacement efforts under the name “Tsuzuri: Cultural Heritage Inheritance Project.”²⁶ Tsuzuri categorizes its work as, on the one hand, “High

²⁴ The *Katatazu fusumae*, presumed to have been purchased by the famous businessman and art collector Iwasaki Yatarō (1835-1885), are held in the Seikadō museum which preserves his collection. In the course of their acquisition, the sliding door paintings were remounted in folding screen format. See Tamamushi, “Daitokuji Zuihōin ‘Katata no ma’ fusumae no kenkyū.”

²⁵ For a press release related to the exhibition of digital copies at Artexpo New York, issued by Hewlett Packard Japan (in Japanese), see “Zaidan hōjin Kyōto Kokusai Bunka Kōryū Zaidan to HP: Geijutsu bunka isan no degitaru ākaibu jigyō de teikei,” <http://h50146.www5.hp.com/info/newsroom/pr/fy2006/fy06-065.html> (accessed April 4, 2017). See also Biersdorfer, “Digital Methods Help Replicate Artworks.”

²⁶ “Tsuzuri: Bunkazai mirai keishō purojekuto,” <http://canon.jp/tsuzuri/>; for

Resolution Facsimiles of Japanese Art Abroad” and, on the other, “High Resolution Facsimiles of Historical Cultural Assets.”²⁷

The objective behind the first digitization category is “to donate high resolution facsimiles of precious Japanese cultural assets that have been owned in other countries over the course of history to their former owners in Japan.”²⁸ Tsuzuri has therefore produced various works that have “returned home,” at least in digital reproduction form, including Kanō Sansetsu’s (1590-1651) four-panel sliding door paintings of *The Old Plum (Rōbaizu)*, owned by the Metropolitan Museum of Art, New York; and Tawaraya Sōtatsu’s (d.u.-ca.1643) six-panel folding screen painting of *Waves at Matsushima (Matsushimazu byōbu)*, owned by the Freer Gallery of Art, Washington, D.C.²⁹ The Sansetsu copies were installed on site at the paintings’ former owner, the Tenshōin subtemple of the Kyoto monastery Myōshinji, and the Sōtatsu copy was given to its former owner, the temple Shōunji in Sakai City, Osaka Prefecture.

The objective behind Tsuzuri’s second category is to “promote the use of high resolution facsimiles as ‘living aids’ for teaching Japanese history, and targets cultural assets that most people may remember from their history textbooks in elementary and junior high school.”³⁰ Following this theme, Tsuzuri has undertaken what it calls its “cultural properties sommelier project” (*Bunkazai somurie*) in cooperation with KCA and Kyoto National Museum, in which curators and graduate/undergraduate students use full-scale digital copies in talks presented at elementary and secondary schools in the city of Kyoto.³¹

Tsuzuri’s “returning home” digitization projects have obvious value in their reproduction and installation of works that have previously been displaced abroad from particular owners and architectural contexts in Japan. At the same time, Tsuzuri has also carried out digitization with the specific goal of replacing original, *in situ* works with veristic copies. In March 2010, for example, Tsuzuri completed the digital replacement of thirty-two panels of Hasegawa Tōhaku’s *Landscape (Sansuizu fusumae)*; Important Cultural Property) that decorated the Entokuin subtemple of the Kōdaiji temple in Kyoto. The original paintings were divided into

introductions to its success projects, see <http://canon.jp/tsuzuri/works.html> (accessed April 4, 2017).

²⁷ Canon, “Overview,” <http://global.canon/en/tsuzuri/overview.html> (accessed April 4, 2017).

²⁸ <http://canon.jp/tsuzuri/overview.html> (accessed April 4, 2017).

²⁹ For the Sansetsu paintings (1975.268.48a–d), see <http://www.metmuseum.org/toah/works-of-art/1975.268.48>; for the Sōtatsu screen, see <http://www.asia.si.edu/explore/japan/matsushima/screen.asp> (accessed April 4, 2017).

³⁰ <http://canon.jp/tsuzuri/overview.html> (accessed April 4, 2017).

³¹ “Bunkazai ni shitashimu jugyō ni tsuite,” *Kyoto National Museum*, <http://www.kyohaku.go.jp/jp/culture/sch/sch002.html> (accessed April 4, 2017).

two groups and stored in the Kyoto National Museum and the Ishikawa Nanao Art Museum, Nanao City, in Ishikawa Prefecture, 326 kilometers from Kyoto.³²

The Denshōbi project, directed by DNP, has been equally ambitious.³³ Its digitization and replacement efforts include, in 2007, the wall and sliding door paintings by Kanō Eitoku (1543-1590) and his workshop at the subtemple Jukōin, within Daitokuji (twenty-four panels; National Treasure); the 2009 reproduction of sixty-three panels painted by Maruyama Ōkyo and his workshop at Daijōji, Hyogo Prefecture (Important Cultural Property); and the 2010 reproduction of forty-seven wall and sliding door paintings by Kanō Tan'yū and Hara Zaichū (1750-1837) at Ikkyūji (Shūon'an) in Tanabe City in Kyoto Prefecture. In each case the original paintings were replaced with digital copies; those from Jukōin are now stored at the Kyoto National Museum, and in the cases of Daijōji and Ikkyūji, the paintings are stored in their respective temple museums, with periodic exhibition in the case of the former and regular display of some panels in the latter.

Denshōbi defines its digitization processes in terms of three categories: “actual state reproduction,” which replicates the exact condition of an original work; “standardized reproduction,” which replicates a group of works and adjusts their appearance based on the color and condition of a well-preserved area of the original; and “restorative reproduction,” which adjusts reproduction according to an expert’s judgment of the original appearance based on analysis of technique, materials, and historical context.³⁴ The selection of a particular type of reproduction is done through consultation with the owner and a given project’s supervisor (typically a renowned art historian or artist).

In the background of the recent boom in digital replacement projects in Japan is the country’s “industrial-cultural complex.” As the world’s third-largest economy Japan has a highly advanced electronics industry. Canon, for instance, has dominated the worldwide interchangeable-lens digital camera market since 2003.³⁵ Japan’s two largest print industry companies, Toppan and DNP — which control a combined eighty percent of the market with nearly 3 trillion yen in sales in FY2013³⁶ — are avid supporters of the digitization of cultural properties. The accumulation of capital and technology in the high-tech imaging and printing

³² The paintings’ original owner, prior to Entokuin, was the subtemple Sangenin within Daitokuji. The decision to store half of the original paintings at the Ishikawa Nanao Art Museum was due to Tōhaku’s birth in Ishikawa Prefecture.

³³ <http://www.dnp.co.jp/denshoubi/> (accessed April 4, 2017).

³⁴ <http://www.dnp.co.jp/denshoubi/tech/> (accessed April 4, 2017).

³⁵ <http://global.canon/en/news/2016/20160329.html> (accessed April 4, 2017). The annual sales of Canon is 3.7 trillion yen for FY2013. <http://gyokai-search.com/4-kaden-uriage.htm> (accessed April 4, 2017).

³⁶ <http://gyokai-search.com/4-insatu-uriage.htm> (accessed April 4, 2017).

industries drives digital replacement in terms of hard and software and public relations.

It is likely too that Japanese cultural concepts and practices may speed the adoption of digital replacement, especially that of *utsushi* which is evident in the arts broadly defined³⁷ In artistic practice in Japan an *utsushi* is literally “a copy,” but such objects do not carry negative connotations because of the masterpiece status of their source/model. Moreover, an *utsushi*-artwork made by a renowned artist may itself gain prestige in Japanese art history, becoming a masterpiece in its own right. Digital reproductions of cultural properties might in theory then be considered the *utushi*-art work of modern information society.

As corporation-backed entities involved with the digitization of cultural heritage, Tsuzuri and Denshōbi differ: the former (Canon) is a manufacturer of digital cameras and printers and the latter (DNP) is a printing company. These business and technology differences are reflected in their respective digitization processes and projects. Not surprisingly Tsuzuri makes use of Canon’s digital camera technology to capture data and employs Canon’s image processing software and large-format printers to produce reproductions on Japanese paper or silk. In some instances, artisans then apply by hand to the digitally printed reproductions areas of gold pigment and or gold leaf. Denshōbi, on the other hand, typically employs large-format scanners to capture digital data and prints its reproductions onto paper, silk, or wood, having applied gold leaf to these surfaces prior to digital printing. These production differences affect the qualities of digital reproduction. Additionally it should be noted that Denshōbi (DNP) has undertaken a significantly larger number of replacement projects than has Tsuzuri (Canon) (Table 1).

Two Brief Case Studies

Let us now examine two cases of digital replacement, beginning with Maruyama Ōkyo’s paintings at Daijōji in Hyogo Prefecture east of Kyoto. Ōkyo and his workshop produced 165 sliding door paintings, decorating thirteen rooms in the temple, out of gratitude for the abbot’s financial support of the painter early in his career. Seventy-five of the panels have been designated Important Cultural Properties in 1969. Ōkyo was a high-profile Kyoto-based painter who was also the founder of the Maruyama School, which remained active in Kyoto until the nineteenth century. It is likely that Ōkyo and his disciples produced the temple’s paintings in Kyoto. We may therefore treat them as works that emerged from within Kyoto’s cultural heritage context.

Daijōji was established in 745 by Gyōki (668-749), a priest renowned for his dissemination of Buddhism to commoner society. The temple belongs to the Shingon

³⁷ As for the copy culture in Japan, see Cox, *The Culture of Copying in Japan*.

denomination of esoteric Buddhism and is located in a small, remote seaside town. It has long derived financial revenue from tourism, and numerous visitors stop by the temple to see the Ōkyo paintings while on route to nearby hot spring resorts or as part of gourmet food tours (specifically for the region's crab). In popular parlance, Daijōji is "Ōkyo's Temple" (Ōkyo-dera).

In April 2000, the temple and its parishioners organized a committee to undertake the construction of a storage space dedicated to Ōkyo's paintings; the best method of preservation, they believed, was the removal of the paintings from their original architecture setting. At the same time, the temple consulted DNP regarding the feasibility of producing digital reproductions of the original works. The Agency for Cultural Affairs, meanwhile, agreed to subsidize half of the cost of constructing the Daijōji storage facility, which was completed on the temple grounds in May 2003 with additional funds provided by Kasumi City and Hyogo Prefecture and with donations for parishioners and the general public. The facility is designed specifically to recreate the plan of the original architectural space into which the original paintings had been initially installed, thereby maintaining Ōkyo's compositions and arrangement. The storage building is open to the public twice each year.

Prior to the relocation of the original paintings to the temple's storage facility, Daijōji selected DNP to oversee the production of digital copies. Digitization began in 2005 under the supervision of an artist and it followed DNP's "restorative reproduction" process, whereby the digital data was manipulated to recreate the painting's imagined original state at the time of their completion in the eighteenth century. DNP developed specialized inks in order to print on top of gold leaf and, having overcome additional technical difficulties, succeeded in reproducing the sixty-three panels designated Important Cultural Properties. The completion of the replacement project was announced at a press conference held at the temple in April 2009.

Despite the considerable time and resources devoted to this project, the digital reproductions are, in my view, deficient in a number of ways, perhaps fatally so. Owing to the restorative manipulation of the digital data, the copies appear far brighter than the now aged originals, an effect especially noticeable in the *Peacock Room* (*Kujaku no ma*), in which clean, new gold leaf has replaced the serenely weathered qualities of the gold leaf found on the original paintings that had developed over centuries. This in turn produced a sharper tonal contrast in the reproductions between the ink brushwork and the shiny gold surface, distancing the copies even further from the appearance of the original paintings (figure 1). Additionally, the subtle chromatic effect derived from Ōkyo's use of *shōenboku* (a pine soot ink) for the peacock feathers, which appears blue under certain lighting conditions and is still visible in the original paintings, is not reproduced. Moreover, the printed (rather than hand brushed) ink brushmarks in the copies fail to capture the fine tonal gradations evident in the original paintings, seen for instance in the subtle variations in Ōkyo's rendering of overlapping pine needles. Clearly, the devil is in the details, and

technical limitations in the printing process led DNP to enhance the visibility of the ink lines that describe pine needles by adding white accents alongside individual needles (fig. 2). In the process of this sort of retouching, a considerable amount of painting that the project team deemed to be discoloration was erased. For example, in the *Landscape Room (Sansui no ma)*, a pale ink line deemed by some art historians to be the ocean horizon was “cleansed” from the digital data and the resulting copies because it was deemed by the project to be the result of tarnish from gold leaf squares rather than original brushwork.

Between 2009 and 2013, meanwhile, Tsuzuri undertook the digitization of paintings by Kaihō Yūshō (1533-1615) that once decorated the Abbot’s Quarters of the Kyoto Zen monastery Ken’ ninji and were designated an Important Cultural Property in 1919 and 1921.³⁸ In September of 1934, the building was destroyed by a typhoon. Fortuitously, however, the paintings had been removed from the building prior to the storm (to open up the interior for a religious service) and therefore survived unscathed. Following this natural disaster, each of Yūshō’s sliding door panel paintings was remounted in hanging scroll format (*kakejiku*), which disrupted the continuous composition created by panels installed in sequence in an architectural space. The reformatted paintings were then deposited in the Kyoto National Museum. In 1940, the renowned modern painter Hashimoto Kansetsu (1883-1945) produced a new set of sliding door paintings for Ken’ ninji, including his masterpiece *The Flow of Life (Shōjōruten)*, which were installed in the monastery’s reconstructed Abbot’s Quarters building. Thereafter, Kansetsu’s paintings continuously decorated its rooms across the twentieth century and into the twenty-first. In 2011, however, Kansetsu’s paintings were abruptly replaced with digital copies of Yūshō’s sixteenth-century paintings (fig. 3). The Tsuzuri project began by producing digital reproductions of four panels of Yūshō’s *Dragons and Clouds (Unryūzu)* and eight panels of his *Flowers and Birds (Kachōzu)*, and by 2013 the project had replaced forty-six panels painted by Kansetsu with Yūshō copies. Comparison of the digital Yūshō reproductions and originals reveals the ink in the former to be noticeably darker than that in the latter. Visitors are not able to make such comparisons, however, as is often the case with digital replacement, for unlike the situation at Daijōji, the original Yūshō paintings (still in hanging scroll format) are stored in the national museum and are not on display in a temple museum space. The Ken’ ninji project raises a number of critically important issues, including the judgment that Kansetsu’s paintings should be dislocated from their architectural setting and replaced with digital copies of the chronologically earlier Yūshō paintings. That Kansetsu’s paintings are themselves candidates for future National Treasure or Important Cultural Property designation makes the project all the more controversial.

³⁸ Ken’ ninji is the headquarters of the Ken’ ninji Lineage of Rinzai Zen Buddhism, which was established in 1202 by Eisai (1141-1215), the first priest to transmit Chan (Zen) from Song Dynasty China to Japan.

As is the case with all digital replacement projects undertaken to date in and around Kyoto, however, the decision-making processes behind the project at Ken'ninji was entirely lacking in transparency. It is also problematic that the monastery discloses the presence of the digital reproductions of Yūshō's paintings only in Japanese, despite the fact that the monastery is often filled with foreign visitors.³⁹

Critical Issues

In his study of the replacement of Kanō Eitoku's paintings at Jūkōin, Daitokuji, with digital copies, Gregory Levine has argued that the contexts of original works of art should factor in any assessment of such projects.⁴⁰ In Andrew McClellan's view, meanwhile, the affective power of art is weakened when removed from its original context.⁴¹ Most Japanese art historians, however, do not attach such weight to the relationship between an original work and its original context. Nevertheless, in the case of wall and sliding door paintings installed within temple buildings, there is an intrinsic link between the pictorial work and its architectural context. Painters such as Eitoku and Ōkyo developed their compositions having taken into consideration the architectural plans of individual rooms and buildings as well as surrounding spatial environments. In a number of cases, the pictorial compositions of wall and sliding door paintings connect visually with compositions and motifs located in adjacent rooms and with exterior landscape gardens. The dislocation of a set of paintings from their intended location effectively destroys the symbiotic pictorial-architectural (and ritual, social) context, at least in terms of the integrity of its mutually original material, visual, and spatial identity.

When original paintings emerge occasionally from dark, hidden away storage spaces, their display is often under poor lighting in exhibition galleries; it is axiomatic that the painter did not paint these works with a museum environment in mind. Rarely do original works sequestered in storage return for display, even temporarily, within their original architectural contexts.⁴² Moreover, when sliding door panel paintings are stored away from their original architectural settings, their wood frames—which are normally supported by beams that provide grooves for

³⁹ Tsuzuri's digital reproductions of Tawaraya Sōtatsu's *Wind and Thunder Gods (Fūjin Raijin zu byōbu)*, a pair of folding screen paintings designated a National Treasure, are exhibited at the monastery without any notification to the public of their status as digital copies.

⁴⁰ Levine, "On Return."

⁴¹ McClellan, *Inventing the Louvre*, 201.

⁴² Jyūkōin, Daitokuji re-installed Kanō Eitoku's sliding door paintings during March 1, 2016 to March 26, 2017 for the 450th anniversary of its founding. It was the first case of the temporal re-installation of replaced original works.

them to slide along (*shikii*) within specific rooms—may expand or warp, in turn preventing the paintings' later re-installation in their original setting. Cultural heritage administrators, meanwhile, generally seek to avoid the “unnecessary” transport of large-format wall and sliding door paintings, especially those designated National Treasures or Important Cultural Properties, from museum storage back to their original sites.

The tendency to de-value the integrity of artistic and architectural contexts as interrelated wholes is in fact promoted by the administrative structure of cultural heritage management in Japan. The dislocation of wall and sliding door paintings from temple buildings in Japan generally raises no questions in part because different divisions of the Cultural Properties Department of the Agency for Cultural Affairs oversee different categories of cultural property: the preservation of paintings falls under the supervision of the Fine Arts Division; buildings under the Architecture and Other Structures Division; and landscape gardens under the Monuments and Sites Division.⁴³ Administratively, therefore, wall and sliding door paintings are separate entities and readily detachable from buildings and gardens. This management structure in turn reflects disciplinary divisions within art history, architectural history, and landscape design history as they are practiced in Japan, which leads to the segregated study of paintings, buildings, and gardens. Moreover, these sorts of subdivisions and disconnections are reproduced in the training of new generations of art historians, curators, and architectural and landscape historians. A vicious cycle has been set in place, therefore, one that promotes the destruction of the interrelationships of original pictorial and architectural contexts. One might add that art historians and curators who view “observation under standardized lighting,” such as that used in museum contexts, as a prerequisite to painting study, based on their disciplinary-bound training, are predisposed to support digital replacement—which brings original works into museum contexts—and, in turn, the destruction of original contexts of cultural heritage.

Additionally, it should be recognized that the placement in storage of cultural properties, such as the wall and sliding door paintings under discussion here, is by no means entirely or in all cases felicitous to their preservation. It is common knowledge that cultural properties should be kept in conditions of stable temperature and humidity and away from corrosive chemicals and entirely dark locations. Despite such common knowledge, a recent textbook edited by the National Research Institute of Cultural Properties, Tokyo, an authoritative institute for conservation science in Japan, indicates specifically that “Neither the Agency for Cultural Affairs nor any academic body has defined the guidelines or criteria for establishing air cleanliness in the

⁴³ For the organization of the Agency for Cultural Affairs, see “Policy of Cultural Affairs in Japan, Fiscal 2016,” http://www.bunka.go.jp/english/report/annual/pdf/2016_policy.pdf (accessed April 4, 2017). A chart of the Agency’s organization appears on page 1.

storage of cultural properties.⁴⁴ This assertion should be sufficient to alert the general public that an unequivocal belief in the safety of museum storage may be misguided. The National Research Institute report provides target values for establishing air cleanliness for the short-term loan of cultural properties, but it does not advocate the long-term storage of wall and sliding door paintings that employ natural pigments, which is the case for all of the designated works subject to digital replacement.

Museum storage also subjects works to conditions of compact warehousing that may be deleterious to preservation by virtue of restricting ease of close and routine observation. In contrast, when wall and sliding door paintings remain installed in their original buildings, they are available for conservation specialists to conduct direct and repeated evaluation of their physical conditions; *in situ* preservation also permits access for appreciation and research by larger numbers of people. Needless to say, close observation of original works of art is absolutely essential to the training of future generations of scholars and curators. As the case of the wall paintings from the late seventh to early eight-century Takamatsuzuka Tomb demonstrates, meanwhile, the closing off of cultural property sites may allow degradation to occur unnoticed and may result in delays in necessary conservation measures.⁴⁵ In the case of one museum, I learned that objects placed in its storage are documented in terms of their dimensions and general conservation conditions, and then photographed in black-and-white; no effort is made to document the object's color.⁴⁶ In the case of large museums, such as Japan's national museums, which are the custodians of designated cultural properties, it is simply impossible to conduct thorough condition examinations of each stored object on a routine basis.

The anxieties of temple owners, which I noted earlier, dove-tail with the Agency for Cultural Properties policies for the protection of cultural properties, in turn promoting the development of digital replacement. It is obvious, however, that third-party players have actively promoted such replacement projects, namely the corporations that develop digital image technologies and manufacture digital reproductions. So far, these corporations seem to regard their involvement in the manufacture of digital copies of cultural properties as an advertising opportunity. Although HPJ, Canon, and DNP have not derived profits directly from their participation in digital replacement projects, they jointly hold exclusive rights to the image data of

⁴⁴ Tokyo Bunkazai Kenkyūjo, *Bunkazai no Hogokankyō*, 66.

⁴⁵ Takamatsuzuka, a mounded tomb located in Nara prefecture, is famous for its colorful wall paintings. Excavated in 1972, the tomb was closed by Agency for Cultural Affairs under temperature and humidity controlled conditions. Over time, however, the paintings deteriorated considerably, a fact that the Agency did not report until 2004.

⁴⁶ The name of the museum must remain anonymous; human resource and budgetary issues appear to have been at issue in this instance.

digitized works with temple owners. Use of the image data requires permission from both parties. It would seem imperative, therefore, the issue of public ownership of such image data be addressed, since repeated scanning and photography of cultural properties is neither feasible nor conducive to preservation. Even with the primary ownership of works by religious institutions and the corporate-initiated acquisition of digital image data, an argument for the public ownership of such data can be made on the basis of the national ownership (and the national subsidy of conservation) of designated cultural properties. In my view, corporations should not hold unconditionally exclusive rights to such image data, which should be stewarded as a public asset for ongoing reproduction and educational use. One solution may be the donation of image data to the national museums into which are deposited original art works. This does not resolve the issue of the considerable cost of future reproductions, to replace earlier copies that have degraded over time, for it appears far easier to generate capital for initial digitization and replacement projects than it is for the production of later copies to replace the initial reproductions. Although it might now seem unlikely that one would visit a temple only to see faded digital replacements of treasured paintings, now locked away in museum storage, this may very well come to pass in the near future.

Amid the rush of digital replacement projects, meanwhile, the voices of citizens who view National Treasures and Important Cultural Properties as “our culture” have been ignored entirely. This brings to mind Derek Gillman’s observations regarding cultural cosmopolitanism and particularism: the former seeks to promote the idea of “the heritage of all mankind” and the latter the idea that heritage is instrumentally and/or intrinsically valuable to particular people.⁴⁷ Arguments for the preservation of important cultural things on behalf of all humankind may be noble and worthy of support in principle, but they frequently conflict with two potentially competing social facts: that many things are claimed by particular cultures and many are privately owned. The quick answer would be that all things are equally part of “world heritage” and a particular national or local heritage. But that is too easy a response; it satisfies symmetry but at the expense of careful recognition of the realities of possession and control.⁴⁸

In digital replacement cases, the positions of the Japanese citizenry may be rather ambiguous. Some citizens may support a cosmopolitan perspective because they do not belong to the temple’s local community—they may therefore advocate against the digital replacement, thereby thwarting the local consensus sought by the temple. Simultaneously, however, they may advocate for certain level of particularism since they may also view temple-held works of art as “our local culture,” and give free hand to the temple, government, art historians, and corporations

⁴⁷ Gillman, *The Idea of Cultural Heritage*, 1, 52.

⁴⁸ Gillman, *The Idea of Cultural Heritage*, 15.

without acknowledging other voices, including those from abroad. Behind such ambiguity is the tension between, on the one hand, the Agency for Cultural Affairs's policy of reducing access to cultural properties and, on the other, the use of public taxes to support the preservation of designated objects, a tension that may grow if taxpayers are constrained from accessing these art works or are no longer able to see the original works at their original sites. At the root of such tensions, meanwhile, is the absence of worldwide public consensus behind digital reproduction/replacement projects. The lack of public discourse in such projects has precluded open discussion of critical and long-term issues.

Indeed the long-term consequences of digital replacement are unclear. Temples have preserved wall and sliding door paintings *in situ* for centuries, and these works have undergone frequent conservation. The replacement of original works with digital copies may reduce the frequency of conservation, but as already noted museum storage is by no means the ideal environment for preservation. Moreover, the reduction of conservation work on cultural properties, following centuries of practice, may adversely impact the transmission to future generations of the conservation techniques necessary for the preservation of cultural properties. Indeed, works of wall and sliding door painting from early modern and modern periods have been preserved in an ecosystem of artists, artisans, temple clergy, and temple congregations. Digital replacement, I would argue, erodes this ecosystem, which has depended upon the transmitted skills of conservation, the artisanal production of the materials and tools used in conservation, the dignity of religious institutions arising both from religious belief and cultural heritage, and local devotion and support. I suspect too that the weakening of this ecosystem will potentially undermine religious communities and the Buddhist institution itself.

There is a common saying among engineers: “Do not use the latest technology if you are not allowed to fail.” In the case of Japan's cultural properties, a “worn-out” conservation technology generally works just fine, while the warehousing of works of art in an artificial environment—the latest technology or at least one that has developed over the past several decades (rather than centuries)—seems to open up all sorts of problems with little or no room for failure.⁴⁹

We should also question the arrogance of certain temple leaders who believe that digital copies are sufficient for tourists (who “don't know better”). It seems quite natural, meanwhile,

⁴⁹ Japanese art conservators routinely refer to the remarkable storage conditions of the Shōsōin Imperial Repository, in Nara, which preserves in extraordinary good condition imperial treasures dating as early as the eighth century. Although they attribute the reason for such preservation to the “closeness” of the building's storage conditions, we should bear in mind that the Shōsōin is not a closed, climate-controlled structure of concrete and steel but a traditional wood joinery structure with specific circulation features not found in modern architecture.

that some, perhaps many, members of the general public as well as foreign visitors may become disinclined to visit temples at which original cultural properties have vanished, a phenomenon with implications for temple economies in which admission fees constitute important revenue.⁵⁰ The potential loss of revenue through disclosure of digital replacement may lead some temples to obfuscate the fact that visitors are presented not with original works but reproductions, and, in the worse case scenario, create the false belief on the part of some visitors that they have viewed actual cultural properties. In my view, cultural properties should be preserved in their original contexts as evidence of enduring temple cultures and histories. What religious institutions should endeavor to do is attract a broader range of visitors (local, domestic, and international; tourists, scholars, and artists) and to empower the temple community and its abbot or abbess, who is surely motivated to pass on temple masterpieces to future generations.

Principles and a Code of Practice

As long as the Agency for Cultural Affairs, temple and private owners, and image technology corporations believe that digital replacement contributes to the preservation of cultural properties, it will remain an active trend in heritage practice in Japan. If that is to be the case, then such projects should be carried out according to consensus-based principles and guided by a collectively agreed upon code of practice.

To begin with, the criteria for undertaking digital replacement (and any other medium of reproduction based replacement) should be defined, working from issues such as cultural significance, age, ritual function, conservation condition, cost of *in situ* maintenance of original works, and the possible impact of replacement on revenue. With regard to ritual functions, Supriya Singh, Meredith Black, and Jonathan O'Donnell point to a general consensus against the digitization of secret/sacred or ritual objects in the case of Pacific cultural collections.⁵¹ No such consensus exists for the digitization of works of art in religious contexts in Kyoto. By and large, the wall and sliding door paintings preserved within Buddhist temples are not objects of direct religious worship and are recognized instead as art works that adorn ritual spaces. This is not the case, however, with Buddhist iconic hanging scroll paintings that have been digitized, such as the *Five Wisdom Kings (Godai sanzō)*, a set of iconic images owned by the monastery Daigoji that function in specific ritual performances. In this instance, digitization may have been deemed permissible by the monastery because of the traditional Japanese Buddhist concept of the

⁵⁰ In the case of Daijōji, annual admission fee revenue dropped by approximately twenty percent (interview with the temple's Vice Abbot).

⁵¹ Singh et al., "Digitizing Pacific Cultural Collections," 91-92.

“mobility/divisibility of spirit,” through which the inherent numinous spirit or identity of the icon/deity may be ritually transferred to, and may then reside within, the reproduction.⁵²

Nevertheless, the digital replacement of art works should proceed following an assessment that includes consideration of alternative media. For instance, is digital reproduction necessarily superior to manual reproduction in every case? Moreover, would it not be preferable to commission contemporary artists to produce new programs of paintings to replace designated works, thereby sustaining a model of cultural patronage, and the aforementioned ecosystem, that has operated in relation to Buddhist temples for centuries? At the very least, decisions regarding which works should be replaced and in which media requires transparency and consensus developed through the inclusion of multiple stakeholders.

To support transparency and consensus, and to provide proper oversight, an independent body—separate from temple owners, the Agency for Cultural Affairs, and digital image corporations—should evaluate each digitization project before it commences. This body should then monitor each replacement project as it proceeds as well as the conditions of original works placed in storage and *in situ* copies, providing guidance to owners and museums consistent with the complex issues that bear upon cultural properties.

A code of practice for digital reproduction/replacement, meanwhile, might include the following items:

1. Present State Reproduction: Digital reproduction/replacement should be limited to the production of copies that reproduce the present physical and visual state or condition of the art work, doing so without supposition regarding the original appearance. Reproduction that attempts to restore the state/or appearance of the work as it existed several hundred years ago inevitably exacerbates the intrusion of personal judgments and creative solutions by art historians, engineers, and artisans, which, in turn, invites disagreement regarding the particular representation of the cultural property offered by the copy.⁵³

⁵² The mobility/divisibility of spirit transpires through the ritual practices of *hakken* (spirit removal) and *kaigen* (spirit installation).

⁵³ Even if precise studies of fading are conducted, the permanent replacement of original works with “restorative” copies that dramatically alter their present visual appearance to a putative “initial appearance” strikes me as highly problematic. This suggests that the digital reproduction and replacement of works that employ considerable amounts of gold leaf and pigment should be avoided due to the technical barriers to the reproduction of the time-altered optical characteristics of these materials. Moreover, “creative” restoration in the process of reproduction may drag the historical work into a context of copyright protection, and we must ask how this situation accords with the understanding of national cultural property as a public asset. Andreas Rahmatian points out that, “the more there is a ‘creative’/independent input by the restorer, the more this is likely to be copyright protected, but the less this is likely to be a

2. **Explicit Notification:** In any instance of reproduction/replacement, especially involving digitization, a temple owner should provide clear and accessible notification in multiple languages regarding the replacement of original works with copies.

Surprisingly, a number of temples do not follow this seemingly self-evident practice.

3. **Local Conservation:** Whenever possible, original works that have been replaced with digital copies should be preserved in a facility located at the site itself or as near as possible and should be accessible to the general public. Such proximity is necessary for comparison between original works and copies and to monitor the degradation of reproductions.

4. **Monitoring of Reproductions and Original Works:** Reproductions should be monitored regularly and scientifically in order to track fading and other types of degradation occurring over time. A set of protocols for enhanced monitoring of warehoused original works should be established to prevent unanticipated discoloration and other forms of degradation.

5. **Replacement Reproductions:** Given the unavoidable decay of digital reproductions, provisions should be established for the replacement of reproductions that show marked deterioration. Ideally, the production of such replacement copies will take advantage of up-to-date digital technology. Those who promote digital replacement should incur the costs of such ongoing replacement needs.

6. **Periodical Re-installation of Original Works:** Accompanying each digital replacement project should be a plan to periodically return original works to their site for temporary display that is open to the general public during specified periods. Ideally, the original works should re-installed temporarily in their original architectural spaces.

The development of a code of practice for digital replacement should be a matter of broad-based consensus. Needless to say, the preceding six items are intended merely as a starting point for discussion. It is my hope that that cultural property professionals, art historians, artists, government officials, and the general public will contribute to inclusive and in depth conversations that bring greater attention and clarity to the issue of digitizing Kyoto's cultural heritage.

scholarly or aesthetically acceptable reconstruction or restoration.” Rahmatian, “Copyright Protection for the Restoration, Reconstruction of Digitization of Public Domain Works,” 58.

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Bibliography

Biersdorfer, J. D. “Digital Methods Help Replicate Artworks.” *The New York Times*. March 4, 2006. <http://www.nytimes.com/2006/03/04/arts/04shri.html> (accessed April 4, 2017).

Cox, Ruppert (ed.) *The Culture of Copying in Japan: Critical and Historical Perspectives*. London and New York: Routledge, 2008.

Daijōji. *Kū o egaku: Daijōji Maruyama Ōkyo no uchū* (Drawing Emptiness: Maruyama Ōkyo's Universe at Daijōji). Blu-ray Disc. Kami-cho, Hyogo prefecture: Daijōji, d.u.

Gillman, Derek. *The Idea of Cultural Heritage* (revised ed.) New York: Cambridge University Press, 2010.

Gomes, Leonardo, Olga Regina Pereira Bellon, and Luciano Silva. “3D Reconstruction Methods for Digital Preservation of Cultural Heritage: A Survey.” *Pattern Recognition Letters* 50 (2014): 3-14.

Kamiuchi, Toshirō, Nagaharu Hamada, and Nobuo Ikeshōji. “Digital Image System (DIS) no kaihatsu to sono ōyō.” *Hitachi Hyōron* 79(7) (1997): 569-576.
http://www.hitachihyoron.com/jp/pdf/1997/07/1997_07_05.pdf (accessed April 4, 2017).

Levine, Gregory P. A. “On Return: Kano Eitoku's *Flowers and Birds of the Four Seasons* and the Digital World.” In *Crossing the Sea: Essays on the East Asian Art in Honor of Yoshiaki Shimizu*, eds., Gregory Levine, Andrew Watsky, and Gennifer Weisenfeld, 285-305. Princeton: Tang Center for East Asian Art, Princeton University Press, 2012.

Malraux, André. *Le Musée imaginaire, Psychologie de l'Art I*. Genève: Skira, 1947

McClellan, Andrew. *Inventing the Louvre: Art, Politics, and the Origins of the Modern Museum in Eighteenth-Century Paris*. Cambridge: Cambridge University Press, 1994.

Rahmatian, Andreas. “Copyright Protection for the Restoration, Reconstruction and Digitization of Public Domain Works.” In *Copyright and Cultrural Heritage: Preservation and Access to Works in a Digital World*, ed. Estelle Derclaye, 51-76. Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 2010.

Singh, Supriya, Meredith Black, and Jonathan O’Donnell. “Digitizing Pacific Cultural Collections: The Australian Experience.” *International Journal of Cultural Property* 20 (2013): 77-107.

Tamamushi, Toshiko. “Daitokuji Zuihōin ‘Katata no ma’ fusumae no kenkyū.” *Kokka* 1206 (1996): 3-26.

Tokyo Bunkazai Kenkyūjo, ed. *Bunkazai no hogokankyō* (Environments for Cultural Property Preservation). Tokyo: Chūōkōron Bijutsu Shuppan. 2011.

Table 1. List of Digital Reproduction/Replacement Projects for Cultural Properties in Conducted for Buddhist Temples, Museums, Shintō Shrines, and Municipal Cultural Properties in Japan (as of July 2014), conducted by the Kyoto International Culture Foundation (KICF); Hewlett-Packard Development Company Japan (HPJ); Dai Nippon Printing Co., Ltd. (DNP); Kyoto Culture Association (KCA); and Cannon, Japan.

Year	Place	Owner	Title	Reproduction Donated/Installed	Proprietor	Replaced
2004	Kyoto	Daikakuji	Kanō Sanraku. Momotakezu (16-17c, ICP)	Daikakuji	KICF	
2004	Kyoto	Toyokunijinjya	Kanō Naizen. Hōkoku saireizu byōbu (17c, ICP)	Toyokunijinjya	KICF	
ca. 2006	Kyoto	Daigoji	Godaisonzō (13-14c, NT)	Daigoji	KICF and HPJ	
ca. 2006	Kyoto	Nanzenji	Kanō Tan'yū. Gunkozu (17c, ICP)	Unknown	KICF and HPJ	
ca. 2006	Kyoto	Seikado Bunko Art Museum	Tosa Mitsunobu (presumed). Katatazu fusumae (16c)	Zuihōin, Daitokuji	KICF and HPJ	
2006	Kyoto	Kitano	Kaihō Yūshō. Unryūzu byōbu	Unknown	KICF and	

		Tenmangū	(16-17c, ICP)		HPJ	
2006	Kyoto	Myōshinji	Kanō Sanraku. Ryūkozu byōbu (16-17c)	Myōshinji	KICF	
2006	Kyoto	Ken'ninji	Tawaraya Sōtatsu. Fūjin rajjinzu byōbu (17c, NT)	Ken'ninji	KICF	
2007	Tokyo	Ōkyokan, Tokyo National Museum	Maruyama Ōkyo. Umezu et al. (18c)	Ōkyokan, Tokyo National Museum	DNP	✓
2007	Kyoto	Jyūkōin, Daitokuji	Kanō Eitoku. Kachōzu fusuma et al. (16c, NT)	Jyūkōin, Daitokuji and EH Inc.	DNP	✓
2007	Kyoto	Jishōji	Yosa Buson and Ike Taiga. Fusumae, hekiga (18c)	Jishōji	DNP	✓
2007	Kyoto	Mieidō, Nishihonganji	Rokkyoku issō byōbu.	Unknown	DNP	
2008	Yamagata	Yonezawa City Uesugi Museum	Kanō Eitoku. Rakuchū rakugaizu byōbu (16c, NT)	Yonezawa City Uesugi Museum	KICF and Canon	
2008	Tokyo	Tokyo National Museum	Hasegawa Tōhaku. Shōrinzu byōbu (16c, NT)	Tokyo National Museum	KICF and Canon	
2008	Kyoto	Seattle Art Museum	Kanō Takanobu. Igozu. (16c)	Hanazono Univ.	KICF and Canon	
2008	Kyoto	The Metropolitan Museum of Art	Kanō Sansestu. Rōbaizu byōbu (17c)	Tenshōin, Myōshinji	KICF and Canon	
2008	Kyoto	The Metropolitan Museum of Art	Ogata Kōrin. Yatsushizu byōbu (18c)	Kyoto City	KICF and Canon	
2008	Fukui	Fukui Prefectural Museum of Cultural History	Anegawa kassenzu byōbu	Fukui Prefectural Museum of Cultural History		

2008	Kyoto	Kitano Tenmangū	Kitano tenjin engi emaki (13c, NT)	Kyoto-shi Heiankyō Sōseikan	HPJ	
2008	Shiga	Okinadō, Gichūji	Itō Jyakuchū. Shiki kakizu (18c)	Okinadō, Gichūji	DNP	✓
2008	Nara	Jingūji, Misoyahashira jinjya	Sō Shōken. Hotoke nehanzu (16c)	Jingūji, Misoyahashira jinjya	DNP	
2008	Kyoto	Shōkokuji	Katō Nobukiyo. Hokke kan'nonzu (18-19c)	Shōkokuji	DNP	
2009	Yamaguchi	Mohri Museum	Sesshū. Sansui chōkan (15c, NT)	Mohri Museum	KCA and Canon	
2009	Hyogo	Hakutsuru Fine Art Museum	Kanō Motonobu. Shiki kachōzu byōbu (16c, ICP)	Hakutsuru Fine Art Museum	KCA and Canon	
2009-2013	Kyoto	Ken'ninji	Kaihō Yūshō. Fusumae (16c, ICP)	Ken'ninji	KCA and Canon	✓
2009	Hyogo	Kobe City Museum	Kanō Naizen. Nanban byōbu (16-17c, ICP)	Kobe City Museum	KCA and Canon	
2009	Shiga	Ōmi jingū	Soga Shōhaku. Rōkaku sansuizu byōbu (18c, ICP)	Ōmi jingū	KCA and Canon	
2009	Hyogo	Daijōji	Maruyama Ōkyo et al. Fusumae (18c, ICP)	Daijōji	DNP	✓
2009	Kyoto	Shōren'in	Aofudō myō'ō nidōjizō (11c, NT)	Shōren'in	KCA	
2009	Wakayama	Muryōji	Maruyama Ōkyo and Nagasawa Rosetsu. Fusumae (18c, ICP)	Muryōji	DNP	✓
2010-2011	Kyoto	Jingoji	Fujiwara Takanobu (presumed). Jingoji sanzō (13c, NT)	Jingoji	KCA and Canon	
2010	Kanagawa	Cleveland Museum of Art	Sesson Shūkei. Ryūkozu byōbu (16c)	Sōunji	KCA and Canon	
2010	Kyoto	Entokuin, Kōdaiji	Hasegawa Tōhaku. Sansuizu fusuma (16c, ICP)	Entokuin, Kōdaiji	KCA and Canon	✓
2010	Shizuoka	Shizuoka Prefectural Museum of Art	Itō Jyakuchū. Jyuka chōjyūzu byōbu (18c)	Shizuoka Prefectural Museum of Art	KCA and Canon	

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2010	Osaka	Freer Gallery of Art	Tawaraya Sōtatsu. Matsushimazu byōbu (17c)	Shōunji	KCA and Canon	
2010	Kyoto	Ikkyūji, Shūon'an	Kanō Tan'yū and Hara Zaichū. Fusumae (17 and 19c)	Ikkyūji, Shūon'an	DNP	✓
2011	Tokyo	Freer Gallery of Art	Tawaraya Sōtatsu. Unryūzu byōbu (17c)	The University Art Museum, Tokyo Univ. of the Arts	KCA and Canon	
2011	Kyoto	Ken'ninji	Tawaraya Sōtatsu. Fūjin rajinzu byōbu (17c, NT)	Ken'ninji	KCA and Canon	
2011	Chiba	Freer Gallery of Art	Hishikawa Moronobu. Edo fūzokuzu byōbu (17c)	Natural History Museum and Institute, Chiba	KCA and Canon	
2011	Tokyo	Mitsui Memorial Museum	Maruyama Ōkyo. Sesshōzu byōbu (18c)	Mitsui Memorial Museum	KCA and Canon	
2011	Saitama	Kitain, Kawagoe daishi	Kanō Tan'yū. Sansuizu (17c)	Kitain, Kawagoe daishi	DNP	✓
2012	Shiga	Rakurakuen, Hikonejō	Unknown. Fusumae	Rakurakuen, Hikonejō	DNP	✓
2012	Tokyo	Freer Gallery of Art	Tawaraya Sōtatsu (presumed). Sakurazu byōbu (17c)	Tokyo Metropolitan Art Museum	KCA and Canon	
2012	Tokyo	Freer Gallery of Art	Ogata Kōrin. Gunkakuzu byōbu (17-18c)	Tokyo Metropolitan Art Museum	KCA and Canon	
2013	Miyagi	Joe & Etsuko Price Collection	Nagasawa Rosetsu. Hakuzō kokugyūzu byōbu (18c)	Sendai City Museum	KCA and Canon	
2013-2016	Kyoto	Tenkyūin, Myōshinji	Kanō Sanraku and Kanō Sansetsu. Fusumae (17c, ICP)	Tenkyūin, Myōshinji	KCA and Canon	✓
2014	Kyoto	Kongōji	Maruyama Ōkyo. Gunsenzu (18c)	Kongōji	KCA and Canon	

2014	Kyoto	Minneapolis Institute of Arts	Kanō Sanraku (presumed). Shiki kōsakuzu fusuma (17c)	Daikakuji	KCA and Canon	
2015	Kyoto	Museum of Fine Arts, Boston	Soga Shōhaku. Unryūzu fusumae (18c)	Tenryūji	KCA and Canon	
2015	Oita	Museum of Fine Arts, Boston	Hasegawa Tōhaku. Ryūkozu byōbu (17c)	Oita Prefectural Art Museum	KCA and Canon	
2016	Kyoto	The Metropolitan Museum of Art	Tosa Mitsuyoshi. Genji monogatari byōbu (16c)	Byōdōin	KCA and Canon	
Unknown	Kyoto	Nijōjō	Kanō Tan'yū. Shōyōzu (17c, ICP)	Unknown	KICP	
Unknown	Kyoto	Daikōmyōji, Shōkokuji	Unknown. Myōon benzaiten gazō	Daikōmyōji, Shōkokuji	DNP	
Unknown	Shizuoka	MOA Museum of Art	Iwasa Matabei. Jyōruri monogatari emaki (17c, ICP)	MOA Museum of Art	DNP	
Unknown	Fukui	Chōhōji	Ren'nyo (presumed). Namuamidabutsu (ca. 15c)	Chōhōji	DNP	
Unknown	Shiga	Tendai shūmichō	Unknown. Jyukai sanseizu	Tendai shūmichō	DNP	



Figure 1. Peacock Room (*Kujaku no ma*), Daijōji, Kyoto. Left: Photograph of original works *in situ* (From: Daijōji, *Kū o egaku*; Right: Digital Replacements *in situ* (photograph by the author with the permission of the temple) .



Figure 2. Close-up of Pine Needles, *Peacock Room (Kujaku no ma)*, Daijōji, Kyoto. Left: Original (from Daijōji, *Kū o egaku*); Right: Digital Reproduction (photograph by the author with permission of the temple).



Figure 3. Digital Reproduction of *Dragons and Clouds (Unryūzu fusuma)*, Ken'ninji, Kyoto. Photographed by the author.