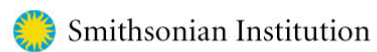


**THE SMITHSONIAN INSTITUTION COUNCIL REPORT:
THE IMPACT OF TECHNOLOGY ON ART MUSEUMS**



OFFICE OF POLICY AND ANALYSIS

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The Impact of Technology on Art Museums

The Office of Policy and Analysis (OP&A) prepared this background paper on the impact of technology in art museums as part of the overall Smithsonian Institution Council Study. Members of the OP&A conducted interviews with Smithsonian staff, secondary source readings, and Internet research.

Technology brings physical changes to art museum exhibitions.

Lighting for display cases has improved with new technology.

Advances in lighting systems allow art museum visitors to view masterpieces without the harm caused by old-fashioned light bulbs. Art museums moved from low-voltage bulbs to fiber optics and then to light emitting diodes (LED). With each step forward, the light becomes less obtrusive, less damaging, and more flexible. For example, Inline Studios¹, New York, designed state-of-the-art display cases for the New York Public Library with a revolutionary cold lighting system comprised of spring-loaded LED bars and conductive glass that allows the light to be positioned anywhere in the case without a visible electrical connection.

Better conservation of artwork is available due to new technological advancements. Conservation is critical when working with delicate, fragile works of art. New environmental controls can be invisibly monitored and linked to a central station through wireless technology. In display cases for the Miho Museum in Japan, Inline Studios designed a data network that links the digital monitoring equipment in the cases so that the temperature and humidity in each case can be centrally, continuously monitored.

Security systems are benefiting from technology.

Increasingly sophisticated security detection devices allow visitors to view valuable, precious objects with fewer physical barriers. SALCO's new proximity sensor, the VS-200, is a flexible sheet of material that fits behind a painting or inside an object. The flexible sheet connects to a two-inch lithium-battery-powered processor that when triggered, simultaneously sounds an alarm and sends a wireless signal to the central security system.

Technology enhances a visitor's experience in an art museum.

Many visitors view technology as an integral part of a museum's service to a modern, multi-generation audience. A visitor study conducted at the Freer Gallery of Art and Arthur M.

¹ Inline Studios official changed its title to Imrey-Culbert on September 7, 2001.

Sackler Gallery² shows that four out of five visitors believe that both videos and interactives are useful in art museums.

Museums move from wall labels to computer devices.

Art museums are using browser technology for computer interactive exhibitions allowing for easier, more cost-effective changes. The San Francisco Museum of Modern Art (SFMOMA) uses video-clips displayed on hand-held devices and interactive kiosks. The Metropolitan Museum of Art's "Audio Program" works off of a single device loaded with audio clips on both temporary exhibitions and the permanent galleries. By pressing numbers on a keypad, visitors can learn about the art works in six languages.

Research is facilitated through technology.

Museums' cutting-edge technologies can provide visitors with access to collections through computer terminals that allow them to conduct in-depth research on the collections by calling up images, zooming in on details, and sorting information by date, by artist or by subject. The Tokyo Metropolitan Museum of Photography, for example, digitized its entire collection of photographs and makes the database available to visitors at terminals near the lobby. Visitors select images on the basis of photographer, theme, place, time, and other variables, and the images are delivered nearly instantly through an interface that is very easy to navigate. A more elaborate program at the Tokyo National Museum's "Gallery of Horyuji Treasures" allows the user to easily explore the smallest details of the artwork with a touch of the mouse.

Technology provides a new way to learn through viewing art.

New technologies can bring the art and its context to life in new ways. The Seattle Art Museum provides an entirely new audio experience to compliment its Egyptian exhibition, "Egyptopedia." Over 100 different Egyptian terms are pronounced in the ancient language with commentary provided by scholars and artists. At the Philadelphia Museum of Art, an exhibition of a 17th century Japanese calligrapher included an interactive handscroll on which an image of the original scroll was projected from beneath, and when a visitor unrolled the scroll the interactive would sing the poem in traditional style.

Technology unleashes a new level of creativity.

Technologies can be liberating and lead to the establishment of a lasting relationship between visitors and museums when the interface becomes intuitive. At The Lowry in Manchester, England, a new technology engages visitors in creative, artistic activities through its "ArtWorks" exhibition. Visitors can move through a sound beam, paint a digital mural, compose music and pictures in "space." Drawings become music, movements turn into sound, and a wall can be painted with the wave of a hand. The museum offers visitation until midnight and a 24-hour virtual gallery.

² Institutional Studies Office, *America Meets Asia: A Report based on the 1995-1995 Freer Gallery of Art and Arthur M. Sackler Gallery Visitor Study* (Washington, D.C.: Smithsonian Institution, 1995) <<http://www.asia.si.edu>>.

Technology helps to create and re-create works of art.

Some museums are recognizing that the products of computer technology themselves are works of art.

The design and content of websites deserve to be collected as artifacts and commissioned as art. For a recent exhibition on technology and art, SFMOMA commissioned web-art. A number of these artists refused to have their work visible in the museum, because they felt that it must be viewed in the more intimate and personal setting of an individual's computer. The museum is now starting to collect this art for the future. To further stress the connection between the web and the museum, the museum hired the same designers to do both the physical installation and the website.

Technology can make art more accessible.

Stereographic photographs have been a serious problem for museums which want to make them available to the public -- they are fragile, rare, require specialized viewing equipment, and have to be handled constantly in order to be viewed with the equipment. A San Francisco design firm, Perimetre Flux, has solved this problem by using NASA imaging technology to convert the stereographs into computer images that can be viewed stereoscopically with a simple headset. Now the collections can be viewed in the unique way that makes them special, but without risking the safety of the objects themselves.

There are problems associated with technology in art museums.

Collection access is a much larger problem than originally anticipated.

General difficulties associated with technology do not arise when physically inputting images into a database, but they do arise when attempting to properly identify the information associated with the images. Many of the items in museum collections have only been approximately and cursorily categorized in the belief that future researchers would take the time to prepare proper identification. Curators may be reluctant to do the type of work that this identification process requires since there is no recognized scholarly product, such as a publication or exhibition standard that has been established, recognized, rewarded, or forthcoming. For example, one of the largest museum image databases is the collection of the Fine Arts Museums of San Francisco with 75,000 (this is 70% of its entire collection) images that can be called by keyword and viewed in considerable visual detail. Although a print can be enlarged until resolution is lost at about four times the actual size, only a short biography of the artist is available, and the artwork itself is rarely described or discussed.

Installation fees, maintenance costs, and constant upgrading can be expensive.

In addition to the initial expense, advanced technologies call for maintenance by a skilled technician. Cutting-edge technology in exhibitions requires incessant

upgrading, and equipment and software must be turned over more quickly. One positive outcome of this rapid change is that, should one miss a wave of technological change, usually the next wave can be picked-up sometimes at a lower cost with continually decreasing prices.

Compatibility and accessibility of programs and equipment can cause significant problems for visitors and museum administration.

Designers usually construct websites with state-of-the-art computer equipment and broadband access to the Internet. When ordinary users access these sites, they may find it difficult to have as satisfying an experience if their equipment is not up to the task. The National Gallery of Art had to withdraw a computer interactive CD-ROM from sale because it kept crashing users' computers.

Some museums use databases to track e-commerce, visitor demographics, and memberships. However, because there are a variety of choices in databases, many museums' divisions select different programs that are not always compatible. A considerable amount of money and time is necessary to create a comprehensive unified database.

Technological advances can be difficult for some curators and museum staff to appreciate.

Because most museum staff began their careers out of a desire to have close contact with artwork, they may be reluctant to recognize that examples of high technology are themselves artifacts, and are often perceived as such by museum visitors. In a study of the "Where Next, Columbus?" exhibition at the National Air and Space Museum for example, we found that one of the most powerful objects in the exhibition was the optical fiber Stellarium. Many visitors in the exhibition described it as the place where they had their most satisfying experience of "the real thing."