

## Developing Digital Libraries: Four Principles for Higher Education

Higher education will surely be well served if it supports and maintains the development of digital libraries that contain works of lasting intellectual value, including both primary sources that open up and support new lines of scholarship in the arts and sciences and secondary sources that record and disseminate scholarly activity. But what priorities and policies should guide higher education in its approach to the development of digital libraries?

Officially launched in April 2001 and funded with a \$5 million startup grant from the Andrew W. Mellon Foundation, ArtSTOR may offer some answers to these questions. The mission of this emerging digital library is to develop, store, provide access to, and electronically distribute collections of high-quality digital images and related materials for the study of art, architecture, and other fields in the humanities. Its first research collection will be the Digital Design Collection, containing nearly 8,000 images with related documentation and representing over 80 percent of the materials in the design collection of the Museum of Modern Art (MoMA). A second major research collection will be the Mellon International Dunhuang Archive, containing high-resolution digital-coverage photography and virtual-reality panoramas of the wall paintings in the worship caves at Dunhuang in western China, as well as digital images of paintings, drawings, manuscripts, the earliest printed books, and other objects that were originally at Dunhuang but are now located in museums and archives around the world. In addition, ArtSTOR is constructing a broader Image Gallery, comprising core collec-

tions of images and accompanying documentation for use in teaching and coursework.

In the early stages of establishing ArtSTOR, four key principles have emerged—principles that will likely be critical in the general development of digital libraries in higher education.

### 1.

The first guiding principle for the development of digital libraries in higher education is to *create scholarly value by exploiting the distinctive features of the technology*. Investments in electronic journals, such as the materials available from JSTOR (the digital library of scholarly journals, <<http://www.jstor.org>>) and from most major academic publishers, have proven to be clear winners because of the economies and ease of use afforded by using the technology to aggregate and search text in thousands of articles. Similar benefits are being achieved for reference works such as encyclopedias and dictionaries and, at a somewhat slower pace because of the expense required to achieve the right scale, for books and monographs. The scholarly advantages of applying digital technology to the collection and dissemination of primary sources are no less real but have proven somewhat more elusive.

As they are building digital libraries, few institutions have begun to assemble primary source collections of Web pages, e-mail correspondence, electronic manuscripts, software programs, electronic games, digital art, and other uniquely digital artifacts that would help serve as a record of modern culture for future scholars. However, many have experi-

mented with digitizing existing collections of primary sources in order to make them more accessible. Many of these projects have digitized the material simply in the hope, often unrealized, that an audience will emerge that is willing and able to sustain the collection. Avoiding the risky “field of dreams” approach requires, in part, a careful appraisal of how the technology can be exploited for primary sources to create scholarly value. For example, although most primary sources are one-of-a-kind items, many colleges and universities maintain slide libraries of reproductions of works of art. These slide libraries typically contain images of the same canonical artworks taught in nearly all undergraduate curricula. ArtSTOR’s Image Gallery aims to create scholarly value by systematically building digital collections of images that it can deliver electronically from a central repository (or a small set of replicated repositories), thereby taking advantage of the technology to avoid the substantial system-wide expense of duplication across institutions. Other ways that ArtSTOR plans to exploit technology is by using high-quality illumination and detail of the digital photography and by providing tools to display these features and make possible comparison and analysis of the MoMA, Dunhuang, and other materials at a level of sophistication that could not otherwise be attained.

### 2.

Assuming an investment in the technology is warranted, a second guiding principle for digital libraries is to *create collections of coherence and integrity*. Many of the early efforts to digitize primary sources

have placed insufficient emphasis on intellectual integrity and coherence as criteria for selection. In some cases, digitizing projects have settled for a “greatest hits” approach, which simply illustrates a collection rather than making it available. In other cases, databases of art images reflect the individual strengths of the museum and other contributors rather than a mutual interest in creating a resource that is genuinely useful to scholars and teachers. There are at least two alternatives to these approaches. First, coherence and integrity can be



Courtesy MoMA, NYC

Rem Koolhaas, with Zoe Zenghelis, *The City of the Captive Globe*, Design Collection, the Museum of Modern Art (MoMA), New York City

achieved by being comprehensive, digitizing all or nearly all of a strong existing collection, as MoMA is doing with its design collections. Alternatively, if selectivity is required, scholars who would use the resource being developed must assist in deciding which images are to be included and how these images should be directed toward a specific pedagogic or research need. Scholarly advice has been central to the selection of materials for ArtSTOR’s Image Gallery. Scholars who are currently writing textbooks in the fields of Asian art and American art, for example, have been asked to identify for possible inclusion in ArtSTOR four or five times the number of images that they would normally be able to include in their printed texts.

### 3.

Even in cases where coherence and integrity of the collections are a prime objective, the high quality that scholars demand can be impeded by a failure to deal directly with intellectual property issues.

Many digital library projects aim too low, settling for poor-quality access—in the form of thumbnails of visual materials—as a way of skirting these critical issues. The legitimate rights of content owners must of course be protected, but the third guiding principle is for higher education to do so in ways that *protect and foster an intellectual commons for scholarly and educational uses*. The Mellon Foundation’s experience in developing both ArtSTOR and JSTOR suggests that several distinctions are essential for striking a productive balance between the intellectual property rights

of content owners and the interests of scholarly users. Above all, commercial uses of copyrighted materials must be rigorously distinguished from noncommercial, educational uses. In the agreements that ArtSTOR has made, for example, content owners retain full ownership rights for commercial and other uses while ArtSTOR is granted a limited and nonexclusive license for noncommercial educational uses. Furthermore, like JSTOR, ArtSTOR will

provide a well-regulated environment for such use, one in which content is available not to all comers but only to authorized users of subscribing institutions, which are subject to a strictly enforced user license.

### 4.

The fourth guiding principle for the development of digital libraries is to *be realistic about costs, especially the costs of distributing content and sustaining ongoing operations*. Building digital libraries is expensive; the costs are not just technical but, as we have seen, involve aiming the technology at scholarly goals, carefully selecting content, and managing intellectual property. There are other significant costs, including those of cataloging. But perhaps the most important and most overlooked costs are those associated with distribution and ongoing support. Many individuals and institutions are seeking to digitize important materials, including art and other visual materials, as primary sources for scholarship, but with rare ex-

ceptions the projects are relatively small-scale, are isolated in data structure, and face enormous challenges in finding an appropriate means of distribution. Entry costs may be low, providing an illusion that cottage-style industry is viable over the long term, but economies of scale are required to make the system-wide costs affordable. To achieve such economies for the distribution of digitized scholarly products, especially when there is little prospect of attracting commercial investment, a provider must be willing to implement a business model that includes a levy of modest user charges as well as a strategy for building a user community that not only wants but also is able to pay to help support the products through the course of rapidly changing technologies. Otherwise, the products are doomed to a Hobbesian life: nasty, brutish, and short. Achieving an economy of scale also requires an efficient means of aggregating content through cross-project and cross-institutional collaboration. One of the most important considerations in crafting a standard agreement with early collaborators in ArtSTOR has been to strike the right balance between the need for aggregation in the distribution process and the interests of the participants in preserving the distinctiveness and identity of their contributions.

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Weaving digital libraries into the fabric of higher education following these four basic principles will require much creativity and, of course, an unswerving commitment to the academic mission. Institutions that have begun the task find that they are creating new kinds of laboratories for the liberal arts and sciences. Such institutions are revitalizing themselves as virtual and physical spaces in which researchers, teachers, and students can come together in shared enthusiasm for the academic mission of creating, collecting, and disseminating works of lasting intellectual value.

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