Building and Sustaining Digital Collections: Models for Libraries and Museums

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Council on Library and Information Resources
Washington, D.C.

The Council on Library and Information Resources (CLIR) acts on behalf of libraries, archives, and universities to develop and encourage collaborative strategies for preserving and providing access to scholarly resources.

The National Initiative for a Networked Cultural Heritage (NINCH) is a diverse coalition of organizations created to assure leadership from the cultural community in the evolution of the digital environment.

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INTRODUCTION

The promise of the Internet to extend the reach of libraries and museums to new users, and to serve traditional users in new and more compelling ways, has pushed many cultural heritage institutions into the new territory of digital programming. Along the way, museums and libraries have discovered that digital distribution is transforming not only the ways in which their collections are used but also the institutions themselves. Among those organizations convinced that digital technology offers new ways of fulfilling their core missions of education, research, and cultural enrichment, the question of what to put online and how to sustain digital collections is hotly debated.

In February 2001, the Council on Library and Information Resources (CLIR) and the National Initiative for a Networked Cultural Heritage (NINCH) convened a meeting to discuss how museums and libraries are building digital collections and what business models are available to sustain them. A group of museum and library senior executives met with business and legal experts, technologists, and funders to discuss the challenges that cultural institutions face when putting collections online and to identify some models for sustainability that support the core missions and do not conflict with the internal cultures of nonprofit entities.

The meeting was supported by the Institute of Museum and Library Services (IMLS), which had also sponsored a meeting that CLIR convened with the Chicago Historical Society in October 1999. At that meeting, reported in *Collections, Content, and the Web* (CLIR 2000), library and museum experts cited several areas of mutual concern and called for further discussion of them among the two communities. More specifically, they wished to explore how to

- develop sound selection criteria
- identify online audiences and assess user satisfaction
- manage intellectual property rights
- develop and share best practices for a variety of technological issues

- implement cost-recovery strategies consonant with institutional culture
- manage the institutional transformations wrought by new technologies

The 1999 meeting brought together many individuals who had varying degrees of experience with putting collections online. That agenda focused on collections, audience, and technology. By February 2001, a great deal had changed. The dot-com boom had waxed dramatically and was just as dramatically waning. The quality and quantity of institutional experience with the Web had changed significantly. Technology per se had receded as a pressing issue, eclipsed by concerns about copyright, funding, and fundamental questions about the transformation of institutions, staff, and even missions. Participants wanted to learn from those institutions that had gone beyond project-based experimentation to develop self-sustaining enterprises. They also wanted to hear from representatives of Web-based educational and cultural enterprises that had developed models for sustainability. CLIR and NINCH invited several Web enterprises to present their business models to the group. The speakers were asked to focus on issues of the greatest interest to the cultural sector and to identify those elements of their business plans that are suitable for libraries and museums.

This report summarizes the information shared by presenters and the discussions that ensued among participants. On the basis of the day's discussions, the group was asked to propose an agenda for action; these recommendations appear at the end of the report. Not surprisingly, the discussions kept coming back to two of the central economic and societal questions of this time: Who owns scholarly output and cultural heritage? Who has a right to access it and under what conditions? While not answering those questions definitively, participants were able to examine them in the context of a new information landscape and to consider how these questions affect our institutions' futures.

CLIR is grateful to NINCH for its vision helping us develop a thought-provoking agenda and bringing together key participants from the museum and academic communities. We thank the National Gallery of Art in Washington, D.C., for serving as the site for the meeting. Special thanks are due to IMLS, which generously supported the conference for the purpose of continuing the conversation begun in 1999 in *Collections, Content, and the Web* and encouraged us to expand the conversation by including a wider range of institutional participants.

Abby Smith
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PRESENTATIONS OF BUSINESS MODELS

Libraries and museums have taken several innovative approaches to extend the reach of their collections and services online. Conference participants heard about six of the most interesting of these approaches, ranging from two enterprises that have been providing access to scholarly journals online for several years to new initiatives that are based on collaborations among institutions. The conference organizers asked the speakers to outline the elements of their business models, describe how they were developed, and predict their prospects for the future. Presenters addressed the following questions:

- *Origins*: What were the origins of the enterprise, what was the vision for the project? Which potential partners were approached?
- *Business models*: What business models were considered? Which were rejected? How is success measured? What obstacles have to be overcome to achieve success?
- *Change*: How has the business model for the enterprise changed over time, and what additional changes are foreseen?
- *Lessons learned*: What have we learned? What advice would we give to others in starting out?

Projects in Scholarly Publishing

JSTOR: Archiving and expanding access to scholarly journals

The JSTOR project was originally funded by The Andrew W. Mellon Foundation to test the feasibility of storing out-of-print journals in electronic form, thereby improving access while reducing storage and preservation costs for libraries. Established as a 501(c)(3) organization in August 1995, JSTOR was charged from the outset with developing a sustainable economic model.

JSTOR's mission is to provide a means for the scholarly community to take advantage of advances in information technology. The primary objectives are to

- create and build a comprehensive archive of important scholarly journal literature
- improve access to older, hard-to-find articles
- work to the benefit of all participants in scholarly communications —publishers, libraries, students, and scholars

To this end, JSTOR acquires rights from publishers to full runs of selected journals in the humanities and social sciences, digitizes the content, and makes it available on the Web through institutional site

licenses. Metadata and abstracts are double-keyed, and text is scanned using optical character recognition (OCR) to enable full-text searching of the articles. In addition, page images are scanned as 600 dpi TIFF files to represent faithfully the content and layout of the print edition. This provides comprehensive coverage, improved searchability, and archival fidelity to the original. Access is free at the point of use.

Assessment. In discussing the development of JSTOR and its business model, JSTOR President Kevin Guthrie began by recalling lessons he had learned while researching a book on the New-York Historical Society. The history of the near-failure of the Society, he said, forces one to reconsider the traditional definition of "assets" belonging to a not-for-profit organization, the need to match the sources of funds to support collections with the uses of those funds, and the critical importance of mission and governance to the success of any enterprise, whether its aim is to turn a profit or to keep its doors open for research, exhibition, and cultural enrichment. Perceived assets can actually be financial liabilities if there is no revenue flow associated with them, and when funds that seem adequate to support them prove insufficient because their allocation is restricted and they cannot be applied to operational needs. The governance structure of nonprofits is also critical to their success or failure, because without board members or trustees who are actively responsible for fiscal decisions, an organization is vulnerable to neglect.

The JSTOR model has so far resulted in good and stable relationships with publishers, libraries, and funding sources. To protect publishers, yet fulfill its archival responsibilities, JSTOR has developed a "moving wall" of access in which the archive adds issues to the database that are generally five years old or older. Publishers retain the rights to the content of their journals, and their current revenue stream is unaffected. The site license agreements are nonexclusive. Moreover, libraries retain access to content in the event a publisher withdraws the license, and users are not charged for access. JSTOR's fee structure reflects the costs of archiving. There is a one-time archive capital fee and an annual access fee, assessed according to the size of the subscribing institution**.** Foundation support has been sought to subsidize the cost of digitizing new collections and, to a limited extent, of providing access to institutions without resources. Three key marketing decisions were made when JSTOR was created: There are no upfront royalties, no agents or distributors, and no advertising. Overhead is kept to a minimum by using the Web to disseminate information about scope, prices, participant lists, and similar issues.

JSTOR defines economic self-sustainability as the point at which, if it stopped adding journals to its database, it could reliably maintain its archive with the resources on hand and the annual contributions made by participating institutions. Success is gauged by the number and range of participating institutions, as well as by the level of confidence that participants have in JSTOR's archiving promise. In other words, are member institutions discarding print copies in

the full knowledge that they can rely on JSTOR? The enterprise gathers statistics about use and disseminates that information broadly, in part to measure success and in part to build awareness among users about their own behaviors.

Obstacles: Archives or Access? The chief obstacles that faced JSTOR at the beginning stemmed from its attempt to use a new model for doing business. It was difficult to get publishers to license their back files and equally difficult to convince libraries to sign on for the license, often because they were expecting a consortial pricing model. While JSTOR's ultimate mission is to change ways of thinking about the economics of archiving in a digital realm, it remains a challenge for JSTOR to build trust as an archiving agent in the library world. Most libraries see it as a great delivery system, not an archive, although anecdotal evidence suggests that this image may be changing, at least among academic libraries that do not see themselves as libraries of last resort.

JSTOR has not changed its business model, but it has adjusted some elements, such as the fee structure. It abandoned its intention to license current issues and has not offered per-article pricing, though it is considering doing so in the future. Perhaps as a dubious sign of its success, JSTOR received several buy-out offers during the dot-com frenzy.

Prognosis. The advent of distance education and online learning might necessitate a change in JSTOR licensing practices. For example, there is a growing demand for licensing to independent scholars. Were JSTOR to do that, it would have to redefine its core mission from being first and foremost an archive to being primarily a provider of access. Nonetheless, it cannot ignore the demand for access. Will JSTOR agree to link to other content providers to facilitate research? Will it lend expertise in digitization to others, perhaps as a consultant? There are a growing number of opportunities to engage in activities that are not now defined as part of JSTOR's core mission but that may well be worth pursuing. Mr. Guthrie cautioned that focus is essential to success, and that any activity that distracts a not-for-profit from its core mission is risky and must be considered very carefully.

HighWire Press: Adding value in access and delivery of scientific journals

Michael Keller, publisher of HighWire Press and Stanford University librarian, stated that the mission of Stanford University Libraries' HighWire Press is similar to that of JSTOR, but that it differs significantly in scope and methodology. HighWire aims to enhance scholarly communication through advanced network and information technology and to encourage innovation based on the mutual needs of publishers, editors, and researchers. This aim is consistent with the university's mission to disseminate information to support teaching and research. Because the press is based at Stanford, HighWire is attractive to publishers. They benefit from the additional exposure that

HighWire brings as well as opportunity to experiment with the added features that distinguish electronic versions from print versions. HighWire aspires to "contribute to a marketplace correction" in scholarly publishing by improving the posture of scholarly societies and of other groups that it deems responsible publishers.

HighWire Press focuses principally on life sciences and medical journals, but has a developing list of social scientific journals as well. HighWire also provides Internet publishing services for the online third edition of the Oxford English Dictionary and for a slowly growing list of knowledge environments. Its focus is not on archiving, but on providing added value in access and delivery systems. It emphasizes full-text delivery service and the development of software and hardware to facilitate it. With economic sustainability a goal from the start, the planners studied journal "use decay." They found that frequency of use was highest (100 percent) at publication. It declined rapidly after three months (to 13 percent) and reached a 7 percent plateau after six months. In October 2000, Stanford University Library declared that the Internet editions of the HighWire journals constitute the journal of record, and its business focus on services, not archiving, was thus reinforced.

Business Model. HighWire Press's business relationships are exclusively with publishers. Because libraries and individuals pay according to use, licensing is not an issue. This model demands that HighWire work simultaneously with a variety of business models; it cannot require publishers to conform to a single pricing approach. Some journals provide free access to back files; others provide access only to abstracts of current articles.

The success of HighWire Press can be gauged by several factors. Qualitatively, there is positive feedback from publishers and customers. Quantitatively, there is a measurable increase in online traffic, more publishers are interested in joining, and journals on HighWire are receiving more manuscripts from authors.

Obstacles: Expansions and Competition. Obstacles to success remain. Some are connected with rapid expansion: a growing content backlog, strain on technical capacities, and competition for qualified personnel are the most conspicuous. HighWire has also come under increased pressure to sell its software or to sell the service outright.

The current and future success of HighWire Press rests on its ability to concentrate on its core mission. It must not be distracted by the possibilities that crop up from time to time—possibilities that, while compelling, would compromise the effectiveness of the press in the long run. Before embarking on the venture, the team at HighWire Press spent a year studying the most frequently cited science literature and homing in on what made that literature successful. They surveyed users in the beginning and continue to gather usage data that, with the consent of the publisher, are made available to the university. The enhancement of research, teaching, and learning—the ultimate goals of HighWire—demands a businesslike approach to opportunities and a disciplined approach to growth. HighWire's ability to create demand for the services it offers carries risk, and any

strategy for growth must follow the same sound business principles that a for-profit firm does. From the beginning, HighWire Press has been seen as a business, not as a project or an experiment.

New Enterprises

International Center for Photography/George Eastman House: Collaboration between two world-class collections of photography

Anthony Bannon, director of the George Eastman House (GEH), and Willis Hartshorn, director of the International Center of Photography (ICP), described a pioneering collaboration between these two organizations, which have common interests and complementary strengths. The purpose of the collaborative effort is to "strengthen fund-raising presence, work together to gather, organize, and share information, foster the exchange of staff, share in the development of exhibitions, educational programs, and collection databases, and undertake joint planning and marketing."

The ICP has a well-established exhibition program, a museum photography school offering one-year certificates and master's degrees, and a range of public programs. The GEH has nearly 400,000 photographs representing the entire history of the medium; an extensive collection of photographic equipment, moving image, and publicity stills; and a comprehensive library of photographic books, manuscripts, and journals. The GEH also offers graduate and postgraduate programs in photograph and film preservation.

Assets. When the partnership was initiated, in fall 2000, senior staff of the two institutions took a careful look at their respective resources and goals and realized that neither could achieve independently what could be achieved by using technology to mesh institutional strengths. Central to the collaboration is a shared conception of research materials as an asset—not only the photo prints but also the "deep" documentary information accompanying the collections. The institutions have compatible missions, organizational structures, and long-range goals. Rather than compete for resources and staff, they decided to cooperate, with each contributing expertise in its area of specialization. They determined that programs would take precedence over collection ownership, and delivery of core services would take precedence over individual profits.

In the near future, the two institutions will focus on a core set of initiatives. They include a series of joint exhibitions that will feature both permanent collections and thematic topics; a joint Web site, which is currently under design; and development of a joint cataloging system.

The collaboration is not a merger. Each institution will retain its own staff, facilities, and collections. Senior staff from each will meet several times a year, much like the institutions' boards of trustees do, to plan shared programs and exhibitions. The jointly maintained

Web site will permit searches for collection data from both institutions, based upon mutually accepted standards and shared technology. The collection data will include linked documentary resources such as object information and image, manuscript notes, secondary texts, biographical entries, and exhibition histories.

Several factors are seen as critical to the success of this enterprise. Both institutions need to examine their priorities and decide which are most consonant with the collaboration's goals. They must then commit resources (including additional staff) to achieve them. Communication among all levels of staff is necessary. Success will be gauged to a significant degree by how much can be delivered to the users—not just digital representations of master photographs but also the curatorial research that supports decisions about collection management and interpretation.

Obstacles: Two Cultures. The potential obstacles to this partnership derive largely from traditional museum culture and assumptions about roles and responsibilities. The barriers are, in other words, human, not technological. The alliance proposed runs counter to the curatorial culture of individual research and interpretation. It was the joint technology group that developed the most creative approaches to collaboration during the planning of this joint venture; this is an important lesson for the future of the enterprise. Concerns about control over the collections, a fundamental operating principle in curatorial practice, will diminish over time. Resistance to change can be overcome by opening communication between institutions and, more important, across domains. The process by which progress is monitored is designed to engender communication; under it, the organizations will conduct regular surveys of users, staff, and board members. Mr. Bannon and Mr. Hartshorn underscored the importance of involving their board members and emphasized the responsibilities that board members are assuming in this partnership.

Questia Media, Inc.: For-profit service provides content and tools for undergraduates

Questia Media, Inc., President Troy Williams spoke of the development of this online research service whose goal is to facilitate undergraduate research and writing. Questia offers content and formatting software to its subscribers at various rates. The database offers subscribers unlimited, full-text access to about 50,000 titles (no textbooks) from 190 publishers in the liberal arts and is growing. Questia acquires the rights from the publishers, so users do not need to be concerned with copyright issues. Texts are provided one page at a time and retain the layout of the print edition. The formatting software allows subscribers to create hyperlinked references, citations, and bibliographies in a variety of styles. Publishers are pleased with the controlled access feature, which discourages downloading of entire texts. Individual subscriber's accounts are maintained on the Questia server, so work is accessible from any location with Web access.

Prognosis. This project was based on extensive market research. The undergraduate community was chosen as the target group be-

cause it is 10 times larger than the graduate school population. The liberal arts curriculum is the focus of content development because the textual resources are well established and widely available; the texts also retain their value over longer periods of time than do those in other fields. During the market research, students were "shadowed" to observe their research habits; some students kept detailed "research diaries." During an environmental marketing scan, Questia staff realized that there is a vast disparity in the levels of online resources available to students, depending on geography, economic resources, and even time of day. Given that all students must do research and write papers, Questia decided that a service that could locate information quickly, cite it correctly, and consolidate the results in an acceptable format would be highly prized. The students said that they would be willing to pay a reasonable price for such a service. The pricing model that Questia developed provides a core database of texts free of charge for certain purposes (for example, to teachers who may wish to verify a student's citations or to students during a preliminary source search). Subscribers pay for the added value of the research tools needed to craft a paper. Mr. Williams said that his original dream was to lower the barriers that students face in starting a paper and to make the proper use of footnoting and bibliography a simple matter.

Obstacles: Critical Mass. Acquiring rights from publishers was the most difficult and expensive aspect of this project. During its initial research, Questia found that it would have to spend $70 million to achieve basic coverage in the liberal arts. This eliminated the possibility that the project could consider operating as a nonprofit organization. While the service is in essence educational, its start-up capital requirements demanded a for-profit model.

Gateway Services

Art Museum Network: Providing gateway services to the museum community

The nonprofit Art Museum Network (AMN) was founded in 1996. Based at the Whitney Museum of American Art, it is a gateway Web site that provides links to information at about 180 art museums in the United States and Canada and at 40 other museums throughout the world. The site includes a directory, as well as links to educational and program resources, for each member of the network. It also provides access to the Art Museum Image Consortium (AMICO), a database of selected images contributed by the member institutions; access to the Excalendar network of exhibition information; links to partners such as the Association of Art Museum Directors (AAMD), the online ticketing agency TicketWeb; and access to a museum shop site. The exhibition calendar includes current and advance schedules and can be searched by region, institution, or keyword. While museum professionals form the core target group, this information is also

of interest to tourists and local residents looking for special-events information.

As described by Maxwell Anderson, director of the Whitney Museum, the AMN began as a listserv and was intended to make it easier for AAMD members to communicate with one another. The project grew as the demand for information grew. It soon became clear that the AAMD members could cooperate with each other on this project because it fell wholly outside their normal spheres of competition—funding, collections, and donors.

AAMD's goal has been to provide a service that could support itself, but not necessarily to make a profit. The business model is designed to generate interest and traffic, not revenue. It is accomplishing its objective: The archival information in the AMICO database and exhibition calendars generates considerable traffic on the site. AMN does not rely on income from site licensing or reproduction rights. Searching the site is free, but the AMN does receive commissions from ticket and museum shop sales made through the Web site. In this way, the network expects to continue operating on a cost-recovery basis.

Future partnerships are being considered with for-profit operations whose mission is consistent with that of the AMN. One possibility, for example, is a partnership with the Reuters News Agency in which the agency would provide news items of interest to the art museum community on the AMN Web site. The AAMD board of directors approves and maintains control of all content. Participating museums are not concerned about tracking benefits to participants over the short term. It has been agreed that benefits will accrue in other areas (e.g., better public relations, more visits). This holds true for AMICO as well.

AMICO is seen as a crucial network component providing high-quality digital images of museum objects through a single site. The AMICO library of more than 50,000 images is available by subscription. It is attempting to build on existing museum digitization projects. Museums differ widely in their readiness to share their collections and information about them. AMICO intends to allow digital content to be produced locally and allow decisions about global access to content also to be made at the local level. Although building to some extent on existing museum digital activities, AMICO aims to provide structure and leadership for member museums that are unsure about how to proceed in digitizing their collections.

AMICO faces a challenge common to consortia, namely, how to convince directors that the activity should be a priority for their institutions. AMICO identifies itself as a mission-driven nonprofit that does not promise members that they will gain financially from participation. It has been difficult in some instances to get museum directors to share information. One of AMICO's selling points is that digitization projects carry a big risk of failure when undertaken alone. Institutional leaders who become involved in digitization wish to avoid costly errors, and joining AMICO is seen as one way of tapping into existing expertise in this area. The deployment of stan-

dards for scanning and description, for example, is a boon to museums of all sizes. AMICO's partnership with the Research Libraries Group has permitted expansion of the test image database using a standard delivery system. This would not be possible through individual institutions' Web sites. AMICO does not intend to be an exhaustive source of information about museum objects, and its member museums are encouraged to view participation in AMICO as a starting point for developing their own digital collections.

Fathom: Academic partnership offers gateway to online courses

Launched in November 2000, Fathom is a for-profit partnership of 13 universities, libraries, museums, and publishers in the United States and the United Kingdom. It provides online courses and access to the resources necessary for related research. The president of Fathom, Ann Kirschner, explained that the company was established by Columbia University to ensure a space for high-quality content on the Web. The venture is currently exploring distance learning to further the university's educational mission.

Fathom's structural model is a hybrid; a board of directors handles business decisions, and an academic council is responsible for content decisions. The partners select the courses that will be offered only after the academic council has evaluated them. A percentage of each tuition fee is earmarked for Fathom's marketing expenses. Because faculty members at the participating institutions are not able to offer courses independent of their home institutions, the institution, not the faculty member, owns the course. Fathom offers access to more than 800 seminars and, for a fee, links to distance learning courses that have been selected from the member institutions' curricula.

Collaboration among Fathom members has gone beyond pure technology. The collective reputations of the member institutions are seen as enhancing the value of the courses offered, and the universities see an opportunity to forge and strengthen connections with alumni interested in lifelong learning. Fathom user profiles also provide the institutions with better targets for marketing.

The shareholders in Fathom are the institutions that have signed a standard agreement and have licensed the use of their logos. Columbia University is the biggest investor in the enterprise, with most of the other participants contributing content, not funding. Contributing institutions receive a commission from sale of each online course. Member institutions identify nonfinancial benefits as more important than the as-yet-insignificant financial rewards. The universities see this as a way of providing new audiences and tools for their faculties—a wider platform for their teaching and research, with digital resources to do things outside the classroom setting. While the current focus is online courses, future services may include educational travel tours, full online texts, and a tie-in to the British Broadcasting Corporation for multimedia content.

Among the lessons Fathom has learned is the how to set the right price and length for courses. Research has revealed that some people interested in distance education experience "sticker shock" upon discovering that an eight-week course costs more than $500. To respond to this concern, Fathom is developing shorter, less expensive courses (e.g., a one-week course for $100) that can help build its customer base. The company's goal is to become profitable within two or three years. Fathom sees the greatest potential for growth coming from alumni of member academic institutions, "occasional learners," and groups such as the American Association of Retired Persons, which offer members opportunities for learning and professional or personal development. Fathom is considering developing a newsletter that would go out to alumni—a new method of linking core constituencies.

For some large public institutions, Fathom offers a way of disseminating public programming to audiences they would not reach through their own sites. The participants also said their institutions see Fathom as a type of risk management. They are striving to develop new core capacities and skills, especially in their curatorial staffs, and Fathom seems an ideal way to engage in experimental outreach and interpretation activities that are not possible within the normal constraints of the institutions. One potential benefit of these collaborative projects is an updated concept of curatorship that encourages other partnerships and yields new definitions and professional competencies. In contrast, a research university that recently joined Fathom sees it as a resource to assist in developing the university's technological infrastructure and the human infrastructure among persons with like interests.

DISCUSSION

Discussion of the presentations focused on the following four topics:

- Business models: How does a museum or library structure an online enterprise: what are the advantages of for-profit as opposed to not-for-profit status?
- Scalability: Given the costs of a digital enterprise, can a single organization achieve success, or is collaboration a sine qua non?
- Organizational impact: How does a new digital enterprise affect the institution—its infrastructure, staff, and culture?
- Sustainability: What elements are necessary to build and sustain a digital enterprise, with respect to infrastructure and to management of external factors such as copyright?

Business Models

For-Profit versus Not-for-Profit: Primacy of Mission

All of the enterprises whose representatives spoke at the meeting claim to have an educational and cultural mission at heart. Is it pos-

sible to identify when a digital enterprise should (or must) be not-for-profit, and when it should (or must) seek shareholders to raise capital, share risk, and pay attention to the financial return on investment?

Questia's experience answers some of those questions. After its founders realized that the business would succeed only if it could achieve a critical mass of digitized books, they decided to seek funding from the private sector. This allowed, and in some ways forced, them to do extensive market research in order to develop a model delivery and pricing portfolio. In addition, the decision to include large amounts of material held in copyright meant that Questia would have to ensure some measure of profit sharing for the intellectual property holders as well as to pay legal staff. The need to be accountable to shareholders actually freed the company to focus on developing a service for a targeted audience. The company did not set out to provide a public service, and unlike a public institution, it did not have to be all things to all people. In addition, the company's ability to pay for talented staff enabled it to attract and retain employees with highly specialized skills. The company invests in training to keep pace with other commercial enterprises.

AMICO, by contrast, made a conscious decision not to follow the commercial model. This decision was based on the fact that its primary audience was a very specific nonprofit target—academic institutions. There were already commercial providers of art and other images, such as Corbis and Bridgman. Because its only aim was to recover costs, AMICO was able to concentrate on developing an infrastructure for the creation and distribution of digital images held by museums for the educational environment.

Fathom was funded by a private university. It decided to try the commercial (dot-com) approach as a way to attract other nonprofit organizations to a venture that it could not undertake individually. In some ways, the "capital" that needed to be raised was not financial, but one of reputation and of depth of intellectual and cultural assets. It is the opportunity to affiliate with other prestigious cultural organizations that draws participants.

While some participants recalled the definition of a successful nonprofit as an organization that "loses money honorably and in the service of high ideals," others objected. They believed strongly that nonprofits must be as "businesslike" as any entity that wants to succeed. Any other attitude is no longer feasible, let alone desirable. Doing business in the digital realm, whether for profit or not, demands large amounts of capital, new skills, and a new organizational culture. The assumption that commercial organizations are better managed, and need to be so, is not only false but also dangerous.

Nonetheless, several individuals from the museum and library communities stressed that there are fundamental differences between the management styles of for-profit and not-for-profit entities. While both need to focus on a core mission, the nonprofit organization generally has a broader time horizon. For-profit companies must keep quarterly earnings and revenue projections in mind. Nonprofit

enterprises usually have a longer period of time to achieve their goals, and the expectations of their board members and trustees can differ considerably from those of shareholders. These could be long-range goals that may never realize a return, as Mr. Keller asserted in his presentation when he said that a major goal of HighWire Press is to contribute to a marketplace correction. By way of contrast, one of the universities that had joined Fathom had decided to participate in part because of the expectation of a long-term investment opportunity that would reap some financial benefits. Many nonprofit organizations do make good money. The difference is that they do not pay this money out to investors and shareholders as for-profit organizations do; instead, they put it back into the enterprise. From the beginning, a nonprofit must be run with the same concern for accountability, efficiency, value for money, and rigor as must any enterprise hoping for success. Many collaborative projects among libraries and museums have failed because they have tried to "reinvent the wheel" instead of simply following established business practice.

Equally important to facilitating development of good business practice is the creation of a comprehensive, frequently updated guide to best practices for digital programs, ranging in subject matter from the technical to the organizational. The availability of a server with open-source tools would reduce the difficulty that cultural institutions face in finding out what others are doing and which practices are best suited for adaptation. Such a server would enable nonprofits to enter arenas now monopolized by proprietary software.

A successful project must have clear definitions of purpose, mission, and audience. To the extent that commercial enterprises are better able to identify, test, and target audiences, as Questia has done, these organizations have a competitive edge. Indeed, many in the academic library community fear that Questia may appropriate the function of the library, because it can offer services that students do not get from their campus library, as well as content.

New Users and New Uses

The subject of users touched off some debate about how a nonprofit can identify users on the Web and capture their attention. What is so compelling that consumers might be willing to pay for it? In the case of Questia, the answer is convenience. In the case of libraries and archives, it is the collection content that people cite as most desirable. Can libraries license or distribute that content in the commercial sector? There are clearly major differences between the resources needed to build and maintain a product and those needed to distribute it. Does that imply there is a fundamental disparity of mission—one the purview of cultural heritage institutions and the other of companies with marketing and distribution expertise? Museums have already undertaken marketing in the "real" world, with museum shops and so forth. Attempts to move that expertise onto the Web, however, have shown that this is a fundamentally different enterprise—one that has the potential to change the culture of the institution far more than building museum shops or selling tickets to blockbuster exhibi-

tions has done to date. The failure of the online enterprise undertaken by the Tate Gallery of London and the Museum of Modern Art in New York underscores that it takes more than pairing the strengths of individual institutions to make such a enterprise succeed.

This brings us back to the promise of the technology to provide access where none has existed before. The Web has brought content, such as art, to audiences that might not have been able to seek it out in real time and place. In so doing, it has changed the profile of traditional audiences. Museums and libraries are not just creating more access but are offering new kinds of access to entirely new audiences. This, in turn, is changing the way museums perceive themselves. It is also changing the nature of curatorial practice and interpretation.

Value Proposition

A notion that Questia investigated in its market research and referred to as the "value proposition" proved intriguing. How much are people willing to pay for cultural assets such as library books, which have traditionally been free at point of access? What is considered indispensable in the online environment? Convenience? By offering convenience of access to these resources, is there a risk that mission-driven institutions will be squeezed out of what is now a market but that never has been one before? If so, what would happen to the largely unfunded work of museums and libraries, such as preservation?

Returning to the issue of business models, the example of the Copyright Clearance Center was suggested to be pertinent. The question for the center was not whether to "go dot-com" or not but rather to determine what partnerships would be crucial to success. Competition in rights management is causing the center's original business model to be reconsidered. However, one business model does not fit all needs, either in the commercial or the nonprofit sector. Models are shaped by such factors as process and scale. Sustainable business plans have many components, each of which interacts with the others and with the outside world. As suggested by the case of the Copyright Clearance Center, one should expect that business partnerships will affect each player and alter fundamentally basic assessment of risk.

Daunting as these opportunities may be to traditional institutions that are responsible for the management of cultural heritage assets, even officials from public institutions, burdened by the need to maintain the ill-defined "public trust," agreed that not to take risk is itself a risky strategy. They are looking for ways to manage the risk intelligently as they step into the digital arena—an arena that demands experimentation and whose rewards for success can be elusive and whose punishment for failure includes the possibility of the loss of public confidence.

Who Pays?

The discussion of various business models begged a larger question: In the era of the Internet, what do nonprofit organizations owe the

public, and what should be free (i.e., without payment at point of use)? The traditional idea of "free access to information" is under fire. Does a publicly supported institution, or even one that is private but exempt from taxation and able to serve collections through the doctrine of fair use, owe the public delivery of a collection for free? If so, how does that institution support such a service? Of course, the assumption that information and cultural heritage has ever been delivered for free is more or less incorrect. Museums have been supported by a number of means, most of them indirect to the visitor or patron until fairly recently. With respect to libraries, homage is still paid to Andrew Carnegie's model of tax-supported public services supplemented by investments by the private philanthropic (or, today, corporate marketing) sector, but this masks the fact that information and access to it were never really completely free. Digital technology in general and the Internet in particular simply mean that costs are now loaded, or could be loaded, on the user side of the equation.

The online environment seems to have created two mutually exclusive promises: For the users, deep and virtually unrestricted access to and integration of cultural data; for the providers, recovery of costs by controlled access. Museums and libraries have always exercised some discretion in granting on-site access to their collections. Some of their policies governing access stem from donor restrictions, others from concerns surrounding privacy concerns, and still others with highly sensitive personal content. The Internet has now introduced new categories of limitation, mostly to do with intellectual property, and these exacerbate the others.

Threshold Issues and Public Expectations

Given the risks associated with developing and distributing digital content, from the financial to the legal, what is going to compel cultural heritage institutions to enter into this arena? Current decision making, even at the most respected institutions, is based on untested or unknown assumptions of social obligation and institutional mission, including the mantra so often heard that content delivered to the K-12 community will transform teaching and, by extension, solve educational problems in the United States. These are heavy expectations, to be sure, and they need to be tested in the marketplace, just as a commercial firm would test them. So far, few such tests have been conducted in the museum and library communities.

For publicly supported institutions, the expectations are especially high. There is a public expectation that access to government information, and to collections that have been collected, cataloged, preserved, or served with some public funds, should be free. Perhaps this is truer of libraries than of museums, because libraries have always been free (that is, patrons do not pay to enter a library or to use the collections).

But from the point of view of these institutions, the distinction between what is a core service, which should be freely accessible, and what is a value-added service is not clear. The cost of going digi-

tal for public museums and libraries is every bit as high as it is for industry. The pressure for such institutions to go online in cost-efficient ways is intense, and few see economic ways of doing so. Building core infrastructure—establishing standards and practices that serve interoperability and easy access—is a complicated process that demands collaboration, and collaboration has costs associated with it. Such public institutions as the New York Public Library and the British Library value the chance to collaborate in a project like Fathom because it offers a way to manage the risks associated with innovation. The model presented by the ICP and GEH demonstrates how smaller, less publicly accountable, institutions can enter into a collaboration that is, in its way, designed to manage the risks associated with change and innovation as well as to build economies of scale for technical expertise and infrastructure.

Scalability of Models and Projects

Because of the infrastructure investments mandatory for any digital program, participants wanted to learn more about how these enterprises were scaled and whether or not the technology precludes small institutions from embarking alone on such projects. The Questia model was decisively influenced by the need to build a big database to ensure that it would suit the needs of the target audience. Because there is a need for a critical mass of monographs in the database for curricular purposes, such a model could not be scaled down. On the other hand, both HighWire Press and JSTOR started out rather small and have the potential to keep growing, based on demand and on availability of quality content. In the case of Fathom, Columbia University decided that a collaborative site was essential to its mission. The barrier to join has been low, because members contribute something they already have—digital content—and financial contributions are not mandatory.

The presentations and discussions made it clear that it is difficult for large, relatively well-funded nonprofit museums and libraries to devise business models that promise to be sustainable. This raises serious concerns about the fate of small and medium-sized institutions to have appropriate space on the Web. All agreed that these enterprises need some catalyzing organization—such as Columbia in the case of Fathom, Stanford University in the case of HighWire Press, or the Mellon Foundation in the case of JSTOR. There is concern that smaller institutions are at a great disadvantage. Production capacity and the creation and sustenance of architectures that are necessary for new opportunities are seldom encountered outside of large organizations. Thus, for many libraries and museums, the only choice is to enter into collaboration, something that also carries a big price tag. For smaller institutions, it is usually too expensive to participate in more than one project at a time. Decisions to support projects by outside funding agencies are often made on the basis of judgments about technical expertise available at a given institution. This eliminates many worthy projects at smaller organizations.

Organizational Impacts

All cultural institutions entering the digital realm must compete in the marketplace for skilled labor. While recruitment may have become somewhat less challenging since the technology market correction of 2000, the problems of recruiting, training, and retaining staff remain acute. What is needed, participants suggested, is a closer working relationship between libraries and museums that can leverage the expertise found in these communities and lead to sharing among institutions and across domains.

As staffing patterns change—increasing the number of professionals with technical expertise, sometimes at the expense of support staff and subject specialists—communication within an organization often breaks down. Organizational strategies such as creating departments on the basis of function or collection, which made great sense before the advent of digital technology, can actually be barriers to communication in the new environment. The traditional separation between text and image research collections, for example, will break down because researchers will interrogate sources in new ways. Users increasingly expect seamless access and simplified rights management—certainly that is the service being offered by Questia. How will traditional "legacy" institutions order themselves to meet those needs? As long as museums and libraries were digitizing discrete collections and mounting them on the Web in a project-based mode, they could isolate the digital activity within the organization. The potential of the technology to transform the nature of research and cultural enrichment means that these institutions must find ways to integrate fully the technology into the fabric of their institutions.

Changing Curatorial Roles

One of the most important effects of this transformation is the changing curatorial role within collecting institutions. Providing access not only to the curatorial voice but also to the source materials upon which scholarship is based, like the ICP/GEH partnership will do, opens museums up to a new kind of scrutiny from the public. Some are concerned that museums are at risk of losing their authority to interpret. Others welcome this development, but are uncertain about how to ensure that their curatorial staffs make the transition to this new model of interpretation. For libraries, the challenges are coming from the other direction. Librarians do not see themselves as mediators in interpretation, but as facilitators for researchers. Putting research collections online demands new skills: selection, interpretation (such as the creation of descriptive metadata that can be indistinguishable from exhibition captions), and presentation. One of the great opportunities for collaboration in the digital realm is between libraries and museums in the emerging new paradigm of "e-curatorship," and such cooperation would be an ideal way to provide cross-fertilization between subject specialists.

Elements of Sustainability

Among the elements needed by institutions of all sizes for sustainable digital programs are standards and best practices, coherent and common digital architectures, and ongoing means for creating and sharing a knowledge base. The creation of a central clearinghouse for technical information would be ideal; for example, it would allow access to information about the state of the art of any number of technical matters. Even a centralized way of listing and providing access to information about what other institutions are doing would be a boon. Participants in the meeting agreed that a registry that would record the existence of digital conversion efforts and supply information about the underlying source materials, the specifications followed for conversion, methods of distribution, and so forth, would be a good place to start. Many conferees also advocated the development of digital service bureaus to provide an array of conversion, distribution, and archiving services for a variety of cultural repositories. This would allow for an aggregation of expertise, streamlining of production processes, and some level of adherence to standard practices. What would be the feasibility of establishing regional centers for digital content production? How could they be structured to promote cultural equality among museums and libraries of varying sizes?

In considering how the user wishes to gain access to culture online, many suggested the need to adopt common standards for the description of cultural heritage data. Such a process would begin with gathering information from museums and library communities about existing data for standards and tools and sharing perspectives on risk assessment, especially in the copyright arena. One example of a needed structure is a "knowledge environment," a collection of information services about digital projects along the lines of a service bureau for data and communications design and development, as well as production. This is something practitioners would use daily—a "tool kit" that would enable nonprofit organizations to gain and share expertise. A guide to good practice should be developed not only for the practitioners but also for funders, who need guidance on what good practices are and how to identify patterns of behavior that work or do not work. More important, the need for guides to best practices shows the related need for establishing new skill sets and competencies. While some expressed caution about the ability to articulate best practices—they felt that so-called best practices rely too much on anecdotal evidence rather than on methodical proof—all agreed on the need to convene groups to begin defining good practice. They suggested that rather than try to come to an agreement on standards, we should find ways to identify equivalencies (semistandard professional tools). The system of knowledge sharing must go beyond the individual organization; professional organizations can play a role. NINCH is developing a guide to best practices for digital projects. The intended readership is staff of museums, libraries, archives, faculty, and arts organizations.

Some participants argued that at this juncture, it is important for funders to distinguish between projects that have broad applicability and those that are focused on developing and testing new approaches to technical or organizational issues. It is important to support experimental approaches that take risks. The public, too, must be supportive of experimentation, i.e., be willing to accept the possibility of failure. Libraries and museums are largely dominated by cultures of risk avoidance and measured response. The culture of stewardship has bred a natural conservatism into the bone of the organizations. Given the challenges posed by the Web, and the new public that it brings to libraries and museums, the focus on addressing short-term problems with short-term solutions risks undermining the public trust these institutions have earned over time.

RECOMMENDATIONS AND NEXT STEPS

In addressing the short- and long-term needs of museums and libraries, participants identified four distinct areas that deserve the greatest attention: the elements of a sound business plan; the elements needed to sustain digital efforts at all types of institutions; interinstitutional issues; and funding.

BUSINESS MODELS

Concerns

- What things can or should be done in the commercial world, and what can or should be done only by mission-driven organizations?
- How do we develop cross-community business models; standardize training; measure institutional readiness?

Next Steps/Actions

- Study costs and benefits of collaboration through case studies.
- Develop criteria that institutions can use to assess their readiness to engage in collaborative digital library or digital museum developments.
- Develop a framework for business planning—a document identifying the components of a business plan, the options available for any component, and the interrelationships of the components.

ELEMENTS OF SUSTAINABILITY

Infrastructure/Institutional Issues

Concerns

- How do we prepare staff members for their new roles?
- How do we turn projects into sustainable programs?
- How do we transform legacy institutions?

Next Steps/Actions

- Host cross-domain discussions about common professional developments, awareness raising, and training needs within libraries and museums. Involve professional associations such as the American Library Association, the American Association of Museums, the Society of American Archivists, and the Museum Computer Network.
- Host a workshop to compare methods for organizational restructuring for large public institutions; then scale this session down to make it useful for other institutions.
- Describe the benchmarks in the transition from project to program in leading to the transformation of legacy institutions.
- Apply rigor to descriptions of what library and museum staff members do; share position descriptions and develop *role* descriptions rather than job descriptions.
- Examine the role of curators and specialists and develop a profile of e-curatorship.
- Determine the balance between the benefits of income from digital assets and the possibility of eroding the "specialness" of an institution when digital assets become widely available.

Infrastructure/Technical Issues

Concerns

- How do we share best practice between and among libraries and museums?
- How do we develop interoperable systems?

Next Steps/Actions

- Undertake more research on interoperability.
- Map metadata schemes, along the lines of the metadata mapping schemes registry that exists at the United Kingdom Office for Library and Information Networking (UKOLN).
- Share good or best practices through targeted workshops.
- Develop a mechanism for exploring common institutional information architectures internationally.

Users and Audiences

Concerns

- How do we determine the needs and preferences of our users?
- How do we conduct market research and target segments of our audience?
- How do online users interact with virtual collections, and how does this use compare with on-site use?

Next Steps/Actions

- Gather studies of users and nonusers to share with museum and library communities.

- Host a cross-domain meeting (i.e., libraries, museums, archives) to discuss common measures, trends, and related matters.
- Conduct research into the impact of the virtual and real library and museum experiences.
- Conduct applied research on how people expect to interact with digital materials.
- Conduct market research of library and museum users to determine what they want from virtual and real museum and library experiences.
- Adopt a segmented approach to the user population, based on market research.

General Cross-Domain and Interinstitutional Issues

Concerns

- How do we support the needs of small institutions?
- How do we share assets developed at considerable expense by various groups?
- How do we assess the impact of changes in copyright law on how libraries and museums manage intellectual property, and how can we shape the law in ways that reflect our interests in fair use?

Next Steps/Actions

- Reconvene museum and library leaders periodically to discuss changes.
- Consider more involvement by organizations in other countries.
- State the problems facing museums and libraries clearly in nontechnical terms; museums asked libraries to formulate "the green, red, and caution lights."
- Specify requirements of some of the infrastructure services to be provided at the regional level, e.g., digitization, cataloging, distribution, and preservation.
- Identify governance issues for services and convene groups, including funders, to address them.
- Develop a statement about the larger ecology to which both large and small institutions can contribute.

Funding

Concerns

- How do we educate funders about the issues that are and will be of concern to them?
- How do we help funders incorporate best practices for sustainability in their grant requirements?

Next Steps/Actions

- Convene funders to educate them about the issues facing cultural institutions.
- Encourage funders to incorporate the best practices we have identified into their requirements.

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American Association of Museums: http://www.aam-us.org

The Andrew W. Mellon Foundation: http://www.mellon.org

Art Museum Image Consortium: http://www.amico.org

Art Museum Network: http://www.amn.org

Association of Art Museum Directors: http://www.aamd.org

Copyright Clearance Center: http://www.copyright.com

Council on Library and Information Resources: http://www.clir.org

Fathom: http://www.fathom.com

George Eastman House: http://www. eastman.org/

HighWire Press: http://highwire.stanford.edu

Institute for Museum and Library Services: http://www.imls.gov

International Center for Photography: http://www.icp.org

JSTOR: http://www.jstor.org

Museum Computer Network: http://www.mcn.edu

National Initiative for a Networked Cultural Heritage: http://www.ninch.org

Questia: http://www.questia.com

Society of American Archivists: http://www.archivists.org

UKOLN: http://www.ukoln.ac.uk

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