

## **ExhibitFiles Front-End Study**

Prepared for the Association of Science-Technology Centers

Randi Korn & Associates, Inc.

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## **Executive Summary**

This report presents and analyzes the findings from a front-end evaluation conducted by Randi Korn & Associates, Inc. (RK&A), of *ExhibitFiles*, a National Science Foundation-funded collaborative Web site for the museum exhibition field being developed by the Association of Science-Technology Centers (ASTC). RK&A conducted in-depth interviews during April and May 2006 to help the Web site development team seek common ground between potential users and the proposed online resource. Findings from this study present a profile of potential *ExhibitFiles* users and feedback on proposed features of the Web site and will inform ASTC in the Web site development process.

## **Principal Findings**

RK&A conducted 17 open-ended interviews with individuals from the museum exhibition development community in the United States and Canada. About three-quarters of interviewees held managerial positions within their institutions.

- Most interviewees used a common language to describe the exhibition development process, which includes brainstorming, designing, prototyping, evaluating, and fabricating. Most interviewees used the term “labels” to describe exhibit text and graphics. Most interviewees mentioned defining goals and objectives, and some used the term “big idea.”
- Two-thirds of interviewees reported that there is no formal system or method for documenting the exhibition development process in their institution.
- One-half of interviewees reported that a lack of resources, including time and money, was a typical challenge their institution faces during the exhibit development process. Many interviewees listed challenges related to interpersonal communication among team members.
- When asked what types of information they typically look for to inform the exhibit development process, three-quarters of interviewees said they first look at what others in the museum field have done on the same topic, including exhibits and exhibitions, evaluation reports, exhibit materials, exhibit labels, and technology.
- Many interviewees cited their desire to learn from others’ mistakes as the primary reason for seeking information during the exhibition development process.

- Over three-quarters of interviewees said they have found the Internet an essential tool for creating exhibits including team communication, sharing documents, research, and access to resources like evaluation reports.
- Nearly all interviewees indicated that email is their primary use of the Internet. Most said they also use the Web to conduct targeted searches for exhibit content, suppliers, and technical information.
- Over three-quarters of interviewees indicated that they actively subscribe to a listserv. Slightly over one-half of interviewees said they subscribed to the ASTC listserv and described it as a networking tool and a way to keep a finger on the pulse of what is happening in the museum field.
- Most of the interviewees said they would like the *ExhibitFiles* Web site to feature overviews of exhibitions, which could include exhibit descriptions, photos, overall budget, goals, schedule/development timeline, funding sources, contact information of exhibit team members, a list of project advisors, and visitor studies reports.
- Interviewees said they would be willing to post the following resources on *ExhibitFiles*: exhibit/exhibition descriptions, photos, evaluations, label text, lessons learned, final budgets, conceptual sketches, marketing materials, educational materials, goals, accessibility information, and technical information. Most of the interviewees cited collegial discourse and collaboration as reasons they would be willing to share this information.
- Interviewees said they would be unwilling or hesitant to share information they deemed proprietary, including detailed blueprints and exhibit drawings, line-item budgets, salary information, grant proposals, evaluation instruments, and software code.
- Many interviewees responded favorably to the idea of users posting comments and reviews in regard to various aspects of an exhibition.
- When asked what aspects of an exhibition would be useful to give and receive comments on, most interviewees pointed to either issues of accessibility and usability or whether the exhibition effectively communicated its big idea and messages.
- Most interviewees cited a lack of time as the factor that would keep them from posting a comment or review on *ExhibitFiles*.
- When asked about the option of leaving anonymous comments on the *ExhibitFiles* Web site, most of the interviewees said they would prefer that users always identify their comments by name to help maintain accountability and a professional tone on the site as well as provide an opportunity to generate discussion among identified colleagues.

## **Discussion**

One of the challenges of developing an online resource is determining the preferences and behaviors of users in a virtual community. This front-end evaluation sought to identify the preferences of the exhibition development community in order to inform the design of *ExhibitFiles* Web site. This study found that the Internet is an integral tool for exhibit development, yet the museum field lacks a centralized, comprehensive online resource to draw

on to inform its practice. As museum professionals grow increasingly technology-savvy, the resources and tools they rely on for exhibition development must keep up or be ahead of the curve. *ExhibitFiles* clearly has the potential to meet this need, and the evaluation findings indicate that the exhibition development community is supportive of and would benefit from this kind of online resource.

Nevertheless, the *ExhibitFiles* project is not without its challenges, including the lack of time busy museum professionals have to adequately document their exhibition development projects and to fully participate in online communities such as existing listservs. *ExhibitFiles* developers also face the challenge of creating a resource in depth enough to be engaging and useful yet broad enough to appeal to the needs of diverse stakeholders within the exhibition development community. The recommendations and following discussion address the preferences, concerns, and suggestions that emerged from the front-end interviews.

*ExhibitFiles Potential.* Although findings show that the exhibition community highly values and utilizes the Internet as a resource and seeks out information from several Web sites and associations to inform the development process, this information is decentralized and often difficult to find. The challenge for *ExhibitFiles* developers is to create not just another museum Web site, but a true clearinghouse of exhibition ideas and exchange. As one finding of the front-end evaluation revealed, brand recognition is an important factor in trustworthiness of a Web resource. Within the museum community, ASTC is a trusted name, thus *ExhibitFiles* has the potential to leverage its reputation to become a central and respected forum for the exchange of resources and ideas about exhibitions.

*Content Organization and Navigation.* The exhibition development field is an eclectic community made up of educators, designers, builders, evaluators, scientists and other content experts, artists, and administrators. Since exhibition development is often a team process, there are many contributors to a given project with similar yet discreet needs and interests. As the front-end interviews and analysis of ASTC listserv postings confirmed, the exhibition development community seeks information about a wide range of subjects—some are interested in pedagogical debate while others focus on the nuts and bolts of exhibit fabrication. At the same time, the findings indicate that the breadth of content found on museum-related listservs is too broad to be useful and relevant for some individuals. Some interviewees expressed frustration in having to wade through queries to find pertinent information and suggested that the degree to which detailed information would be useful to them depends on how well the site is organized. For this reason, the organizational design of the *ExhibitFiles* Web site is critical. The interface must facilitate searchable databases and intuitive navigation in order for users to quickly locate information. The site should aim to meet the needs of an exhibit fabricator on a focused search for information about a particular building material as well as provide a concurrent forum for online discussion. There is room for both if supported by effective interface design.

*Exhibition Documentation and Submission.* Findings indicate that there is positive interest in the ExhibitFiles site soliciting and presenting overviews of exhibitions. With the exception of proprietary information, many institutions and individuals would be openly willing to share a great deal of exhibition development documentation. However, the findings of this report indicate documentation of an exhibition development project is often an ad hoc process and self-reported weakness for many institutions. Many interviewees perceived that organizing their project materials into a form coherent enough to post on ExhibitFiles would be a daunting, time-consuming task. For this reason, ExhibitFiles developers will need to provide users tools for

streamlining the submission process and infrastructure to support exhibition documentation.

By funding professional development projects such as ASTC's *ExhibitFiles*, the Exploratorium's Best Practices in Science Exhibition Development conference and subsequent publication, the National Science Foundation (NSF) has demonstrated an interest in supporting reflective practice within the museum community. While funders such as NSF do require periodic reporting of project development, this documentation lacks the standardization needed to make useful comparisons among exhibition development projects. Perhaps one way to improve documentation efforts is for funders such as NSF to encourage or require grantees to write exhibition development narratives such as the ones included in *Are We There Yet?: Conversations about Practices in Science Exhibition Development*. The formalization of this process would help to ensure that exhibit teams designate time and resources to document their project and, in turn, would also provide a steady source of content for the *ExhibitFiles* Web site. Posting their exhibition narratives on *ExhibitFiles* could provide an alternative means of grant-funded project dissemination beyond the standard conference presentation.

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## **Objectives**

The objectives of the front-end study were to:

- Identify archetypical users within the museum exhibit development community;
- Identify the terminology used by the exhibition design community when discussing the exhibit design/maintenance process;
- Determine what information/ideas the museum community seeks out to inform exhibit development;
- Determine what motivates the exhibit development community to seek out these ideas/information;
- Gauge Internet usage of exhibit development community;
- Identify what users would be willing or unwilling to post on *ExhibitFiles* and why; and
- Gauge users thoughts on the critique aspect of the proposed *ExhibitFiles* site.

## **Methodology**

Data consisted of in-depth phone and face-to-face interviews, collected during April and May 2006. In addition, evaluators analyzed subject heading and content trends from archived Internet listserv data from the ASTC listserv (ISEN-ASTC-L); results of that study are reported elsewhere.

Interviews are a useful tool for understanding ideas and concepts from the visitors' point of view. The purpose of conducting in-depth interviews is to encourage and motivate interviewees to describe their experiences, express their opinions and feelings, and share with the interviewer the meaning they construct about ideas, concepts, and experiences. In-depth interviews produce data rich in information because interviewees talk about their experiences and ideas from a personal perspective.

Interviews were conducted with museum professionals, all members of the exhibition development community. RK&A recruited from a list of core contributors and advisors to the *ExhibitFiles* project, members of National Association of Museum Exhibitions (NAME), and staff members at ASTC-member institutions.

Interviews were 30-45 minutes long. The interview guide was intentionally open-ended to allow interviewees the freedom to discuss what they felt was meaningful. All interviews were audio-

recorded with participants' awareness and transcribed to facilitate analysis.

## **Data Analysis**

The interviews were qualitative, meaning that results are descriptive. In analyzing qualitative data, the evaluator studies the data for meaningful patterns and trends. Following the qualitative tradition of data reporting, trends and themes within the interview data are presented from most frequently to least frequently occurring. Verbatim quotations from the interviews (edited for clarity) are provided in this report to illustrate respondents' thoughts and ideas as fully as possible. The quotations are intended to give the reader the flavor of visitors' experiences. Within quotations, the interviewer's questions appear in parentheses.

## **Principal Findings**

### **▪ Demographics**

RK&A conducted 17 interviews with individuals from the museum exhibition development community in the United States and Canada. About one-half of the interviewees were female ( $n = 9$ ), and about one-half were male ( $n = 8$ ).

The types of institutions represented by interviewees included mostly science centers ( $n = 16$ ), some aquaria ( $n = 3$ ), some independent museum consultants ( $n = 3$ ), and one history museum. Slightly less than one-half ( $n = 8$ ) of interviewees classified their institution as large, while more than one-quarter ( $n = 5$ ) classified their institution as small, including independent consultants. Less than one-quarter ( $n = 4$ ) of interviewees classified their institution as medium-sized.

While the specific job titles for positions with similar responsibilities varied greatly among institutions, the job classifications included exhibit developer/researchers ( $n = 5$ ), museum consultants ( $n = 3$ ), exhibit prototypers ( $n = 2$ ), multimedia producers ( $n = 2$ ), curators ( $n = 2$ ), an evaluator ( $n = 1$ ), a traveling exhibition coordinator ( $n = 1$ ), and an exhibit designer ( $n = 1$ ). Of these various job classifications, over three-quarters ( $n = 13$ ) of interviewees held managerial positions within their institutions. Interviewees' years of experience in the museum field ranged from 3 to 28 years, with an average of 16 years of experience.

### **▪ Exhibition Development Process**

*Roles.* Interviewees were asked to describe their role in the exhibition development process. Although the job titles for positions with similar responsibilities varied, many of the interviewees said they were responsible for similar tasks including developing exhibition goals and objectives, brainstorming exhibit ideas, and researching exhibit content and materials. As stated previously, over three-quarters of interviewees held managerial positions within their institutions. Many managers from medium-sized and large institutions listed fundraising and overseeing the exhibit team as their primary roles (see the first quotation below). In most cases, the managers of small institutions said they were responsible for both the nuts and bolts development work, including prototyping exhibits and writing exhibit label text, as well as overseeing the entire exhibition development process including managing outside contractors (see the second quotation). The roles described by most interviewees from larger institutions were more specialized, including exhibit design, evaluation, prototyping, and multimedia development.

[I do] everything. I mean I try not to do maintenance, but sometimes I can't help myself because I know how to do mechanical things. So I, as an exhibit developer, both research and develop exhibit concepts, put those concepts into words, work with designers to create whatever the look is. I've written labels; I've done evaluations; I've done a lot of exhibit installation and testing, you know, after the exhibit is up. I've done some maintenance, editing labels, sourcing materials, developing contracts with fabricators. So pretty much a lot of different things, maybe not everything.

I'm the project initiator, so I will come up with the concept for the project, organize initial funding generally through a peer review, you know grant process . . . . I generate the idea, I organize the initial grant writing and then what I do is I assemble the team and I lead the team. Overall, I try to do things through a consensus process and rely on people who have specific expertise like evaluators or exhibit designers or multimedia developers, but . . . I'm the project leader of it and, ultimately, have responsibility for the project both to the museum and to the funder.

*Process.* When asked to describe the specific steps involved when their institution develops a new exhibition, most interviewees used a common language to describe an iterative process, which includes brainstorming, designing, prototyping, evaluating, and fabricating. Most interviewees used the term "labels" to describe exhibit text and graphics, although one interviewee referred to this written exhibit content as "signage" and another as the "story." Most interviewees mentioned defining goals and objectives, and some used the term "big idea" to describe the main message and organizational framework of an exhibition (see the first quotation below). Some interviewees described exhibition development in their institutions as a three-phase process using formal terms, including "concept development phase," "design/development phase," and "contract documentation." A few interviewees informally described the exhibition development process in four general phases (see the second quotation).

We do what we refer to as a needs assessment where we help the client or the museum to define their audience and their learning or content goals and outcomes as well as what the specific content is. So we define the objectives, content and audience, and then we also try and help the client define the big idea to use Beverly Serrell's specific term and specific methodology of thinking about the notion of a broad conceptual frame as a specific statement of what this whole thing is all about.

I guess . . . there would be, from my perspective, four basic steps and they would be: define, design, develop, and deliver. The define phase is where do a whole bunch of research and a lot of internal conversation about what we should create experiences around, that's kind of obvious. The design phase, with a small "d," I guess, is thinking about the nature of whether it's the phenomenon or the process or the works of art or whatever it is, that starts to deliver the message that we've talked about in the define stage . . . . The development phase is where you do lots and lots of iteration to figure out how the picture in your head and the message in your head translate into physical or virtual objects and how you would make those things, and then in the delivery phase it's the recognition that once that's on the floor, you're not done. There's iteration, there's operations, there's programming associated with an exhibition for example that might continue through its life or even indefinitely, so in broad strokes those would be phases of development.

Several interviewees said their institutions had more than one development process depending on whether the exhibition is permanent, temporary, or traveling and depending on the funding source for the project. Interviewees from several small and medium-sized institutions made the distinction between the process of developing an entire exhibition and individual exhibit components (see the quotation below). When asked how long exhibition development usually takes, the timeframe ranged from three to six months to four to five years, depending on the content and size of the grant.

Oh boy, it's varied. We've, for some years, been part of an exhibit collaborative for which we've gotten an NSF grant, and we've developed exhibitions that would circulate, specifically made for smaller museums with interactive exhibits that would circulate among us and certainly nationally. So for that process, it's really the only time that we do an exhibition, which is to say, multiple exhibits on a given subject. Most of the time we simply do single exhibits, and so when we're working in the collaborative, it's obviously a different process.

*Documentation.* Interviewees were asked if their institution has a specific method for documenting the different tasks involved in the exhibition development process. Two-thirds of interviewees reported that there is no formal system in place, and of those interviewees, a few said that documentation is not a strength of their institution (see the first and second quotations below). Some interviewees said that the level of documentation is idiosyncratic depending on the exhibit project and the individual team members (see the third quotation). A few interviewees said that evaluation reports served as their only official exhibit process documentation (see the fourth quotation).

Not really. The documentation is not the best. We document what the exhibits are made of, and I will keep track of documentation as far as some of the early evaluations of an exhibit and iterations of signs, and every committee meeting, of course, there are minutes, but that's all the documentation. I won't say there's a set formulaic documentation template that we use. A lot of that we tried to put in with the TEAMS [Collaborative] project. We have this developing online, and one of the issues becomes taking the time to actually take a snapshot of where the work is and put it online. That's often problematic just because we are so strapped for time trying to get the exhibition up.

That's a good question, not really. We have mysterious file cabinets in the exhibit offices, but [our documentation] is sort of a big issue that we have. Our archiving isn't as good as it should be.

As we're working through the process, I keep obsessive amounts of files, sort of what's happening at each stage, because that's my personal process. Different [team] members, different exhibit developers do different things—some keep more records and some keep fewer records.

Well, when we start out we have a timeline, and we know that we move through different phases of the project. But we don't do any particular documentation along the way. Usually it's the evaluators report at the end of each phase that's our official documentation.

*Challenges.* When asked to list some typical challenges their institution faces during the exhibit development process, over one-half of interviewees reported a lack of resources, including time, money (i.e., initial funding for project, overall budget, and money for ongoing exhibit maintenance), and in-house expertise (see the first quotation below). Many interviewees listed challenges that relate to interpersonal communication among team members including differences in personality, culture, vision, and goals (see the second and third quotations).

The primary challenge is funding, and, obviously, long-term maintenance is an issue. The other big challenge is, many of our exhibits are grant-funded, and what ends up happening after the summative evaluation is that we find out things are wrong, but we can't fix them.

I'd say the most consistent challenges are interpersonal relationships. I think the clarity of vision of the senior staff about what they're trying to do, about their purpose, what their goal is.

I think that the fact that our teams are so big, getting universal agreement is probably one of the hardest parts. The more I go on, one of the things I realize is that everyone who is there wants the same thing. They really want a good product, but each person is representing a different kind of subculture of the museum and a subculture also based on their background . . . designer discourse is very different from scientific discourse, and so when you're bringing people together who have different ways of viewing the world, you're naturally going to have tensions.

Several interviewees listed challenges relating to exhibit content including balancing scientific accuracy with visitor accessibility and engagement (see the first quotation below). A few interviewees cited the lack of a central resource for finding out what others have done to interpret a topic as a challenge (see the second quotation). One exhibit manager said exhibit safety was a challenge.

The particular challenge is to present a content rich experience for our visitors that is engaging. It's easy to put a textbook out. It's less easy to put out . . . an exhibition that is rich in content. But the real challenge, then, is to develop engaging activities and experiences for the visitor.

I like to find out if anyone has done something similar. Sometimes that's hard to do. It would be nice to have a central Web site you could go to that would tell us who had built x, y, or z before and talk to them so you don't have to repeat the steps.

*Resources Sought.* The evaluators asked interviewees to identify the types of information and ideas they typically look for to inform the exhibit development process and what their goal is in seeking those resources. Nearly three-quarters of interviewees said they first look at what others in the museum field have done on the same topic including exhibits and exhibitions, evaluation reports, exhibit materials, exhibit labels, and technology employed. Many interviewees cited their desire to learn from others' mistakes as the primary reason for seeking this information (see the first and second quotations below).

I would say looking at a lot of other exhibitions and constantly observing what works and what doesn't work and how visitors are making use of different kinds of exhibit techniques is really important.

Well, I guess [find out if] anyone else done anything similar. Did they do any evaluation of it? What did they use for materials? What did their labels say? [What was your goal in seeking out that information?] It's about shortening the whole process, I think—making it less expensive for us. It's silly to reinvent the wheel.

Several interviewees said they seek scientific research to inform exhibition development (see the first quotation below). A few interviewees spoke of “casting a wide net” when embarking on an exhibition development project that includes looking at sources of inspiration in popular culture including art, music, and entertainment venues.

Well, I need to know the science . . . I need to know the scope, the kind of universe of science that's addressed at that habitat or issue . . . . In the past, we have traveled to the featured habitat [because] it's really important for exhibit developers to really know the habitat.

When asked what sources they use to find information to inform the exhibition development process, over two-thirds of interviewees said they use some type of Internet resource including searching the Web, participating in exhibit-related listservs, and visiting museum-related Web sites (see the first and second quotations below). Over one-half of interviewees said that they use personal contacts with museum colleagues as a resource. Some interviewees cited viewing other exhibitions either first-hand or in photographs as an exhibit development resource (see the third quotation).

We're often do a scan of the ILE [Informal Learning Experiences, Inc.] database of the traveling exhibits, which gives us a good idea of what traveling exhibits are out there. We'll also ask around to colleagues. Sometimes we'll send out an email to the ASTC listserv, maybe do a scan, or talk to people at Grassroots Science, a local science organization.

Informalscience.org we definitely go to a lot. For looking at what's important, going to Project 2061, ITEA International Technology Education Association standards, organizations like that, that have identified what's important educationally. Definitely, if it's a topic related exhibit doing a Google search. If I'm looking for evaluation reports, then it becomes who do I know at what institution that did it and how can I email them to find out who the right person is so I can get a hold of them.

As much as possible, I like to go to places. Sometimes at conferences people share information, particularly images—for me, seeing something is really important. Being there is the best experience, but if I can't be there . . . photographs are extremely important, not just descriptions.

Some interviewees mentioned a variety of books, journals, and magazines as resources including: the ASTC newsletter *Dimensions*, the Exploratorium's *Fostering Active Prolonged Engagement: The Art of Creating APE Exhibits, Are We There Yet?*, and *Cookbook* series, Paul Orselli's *Cheapbook* series, and NAME's *Exhibitionist* journal. Two interviewees mentioned

resources for technical information including Dave Taylor's Web site, Webhead, and a Flash users group.

*Usefulness of Internet Resources.* Evaluators asked interviewees how helpful they have found Internet resources for exhibition development. Over three-quarters of interviewees said they have found the Internet an essential tool for creating exhibits, including team communication, sharing documents, research, and access to resources like evaluation reports (see the first quotation below). Some interviewees commented that, while the potential is there, current museum listservs are too broad to be useful (see the second quotation). One interviewee said that, although the Internet is a research tool for some tasks, it is a poor resource for surveying what exhibits exist on a given topic (see the third quotation).

Incredibly invaluable. I mean, it just would be so hard to develop an exhibition without a resource like the Internet.

They're so broad [museum listservs]. They can just go in a million directions, and I don't want to spend a lot of time sorting through a big collection on 10 different subjects.

[The Internet] is extremely helpful when it comes to doing primary research, but when it comes to finding any exhibits out there that have been done for something that I'm trying to work on, it's not very useful at all.

- **Exhibition Development Community**

*Participation in Professional Associations.* When asked if they belonged to any professional associations, nearly all the interviewees indicated they did. Three-quarters of interviewees said they participate in Association of Science-Technology Centers (ASTC) in some way. Almost one-half of interviewees said they were members of American Association of Museums (AAM). Although three interviewees answered "no" when asked if they belonged to any professional associations, all of these individuals work at an ASTC-member institution. Most interviewees indicated that they were current members of two or three professional associations, but many also named additional associations they had been affiliated with in the past.

When asked what they hope to gain from these associations, two-thirds of interviewees indicated they look for resources and knowledge of exhibit development best practices, and nearly one-half said they hope to gain networking opportunities (see the first quotation below). A few interviewees working as consultants indicated that they hope to gain access to future clients. Of the interviewees who indicated they were members of scientific societies, all said their motivation was to keep abreast of current science. A few interviewees spoke of seeking inspiration, support, and innovation and a few mentioned the benefit of receiving subscriptions to professional journals such as NAME's *Exhibitionist*.

Well, feedback, approaches, ideas, how-to, what people are understanding and learning from their exhibition efforts. I'm always interested in doing different approaches, different ways of presenting complex science or current science or content to visitors; how to engage them; what other people are thinking about in terms of these ideas. Mostly it's come out of sessions and personal contacts.

*Networking Methods and Preferences.* Evaluators asked interviewees to identify their preferred

networking method. Most interviewees selected in-person visits, over phone, or electronic forms of communication, with a preference of personal visits over conference meetings (see the first quotation below). Many interviewees indicated that email was their second networking preference due to the flexibility of this medium (see the second quotation). Some interviewees said they preferred the convenience of the phone, and a few indicated that listservs are a helpful networking tool.

Well, my top of the list preference, of course, is to visit a place and get to see people in their native environment . . . . Second best, I guess, is a conference where you've got a hosting institution that allows all the folks to run into each other informally. The formal conference sessions are much further down the useful list; I think that it's a very inefficient way of sharing information.

I like talking over a beer if possible. If geography makes that impossible, then I guess email and phone. I've used electronics means to have conversations; I've used wickies to sort of build ideas on the fly; blogs are also increasingly a route for communication. None of those are as good as the face-to-face.

- *Internet Use*

Interviewees responded to questions about their use of the Internet, which included both personal and professional uses. Nearly all interviewees indicated that email was their primary use. Most said they also use the Web to conduct targeted searches for exhibit content, suppliers, and technical information. Although some interviewees indicated that they use the Internet as a source for entertainment including reading newspapers, listening to music, and doing crossword puzzles, a few said that they use the Internet primarily for work (see the quotation below). A few interviewees said they use listservs including ASTC's (ISEN-ASTC-L).

At this point, email and the Web are primarily a working tool for me. There's some entertainment value in the Internet, but that doesn't tend to be the way I use it most of the time. It's pretty integrated into my working toolkit.

At the end of each interview, evaluators asked interviewees to rate their use of the Internet using a Likert scale from 1 to 5, with 1 indicating email use only and 5 indicating regular contributions to listservs and community Web sites. Interviewees rated themselves from 1 to 4 with an average rating of 4.

*Exemplary Web sites.* When interviewees were asked to give examples of a Web site they use often and consider trustworthy, the types of Web sites listed were quite diverse. Several interviewees whose job responsibilities involve exhibit building cited the industrial parts supplier McMaster-Carr (see the first quotation below). Several interviewees listed the well-known search engine Google as a site they use often as well as the popular retailer Amazon.com and the online encyclopedia Wikipedia. For science content, several interviewees gave examples of museum-related Web sites including the Exploratorium, Science Museum of Minnesota's Science Buzz, Museum of Science, Boston's Current Science and Technology site, and Informal Science.

Well, the most mundane example is, perhaps, the greatest Web site on earth, the McMaster-Carr catalogue of industrial supplies. Every exhibit builder turns to that

resource weekly, daily, depending on how intensively you're involved in a project. It's just a masterfully put together compendium, so well organized to find what you're looking for. [What makes it trustworthy?] It's not just the Web site, but the Web site reflects the entire institution. They never let you down; the products are in stock; the information it provides about the products is masterful.

Several interviewees listed the Web sites of well-known news organizations including the *New York Times*, the *Washington Post*, and BBC News. They said they consider these Web sites to be "trusted brands" because of their reputation for good journalism. Several interviewees cited brand recognition as a key factor in deeming a Web site trustworthy. Some interviewees said they regard the ASTC Web site as a trusted brand, and some said they visit it often, although interviewees had varying opinions of the usefulness of the ASTC site. A few interviewees gave examples of Web sites specific to their particular expertise or trade including an exhibit designer noting Architectural Record's Web site and an exhibit prototyper listing several how-to activity sites, including the online version of Make Magazine and Instructables.

*Listserv Participation.* Interviewees were asked about their use of professional listservs. Over three-quarters of interviewees indicated that they actively subscribe to a listserv, while less than one quarter said they are not current subscribers. Slightly over one-half of interviewees said they subscribe to the ASTC listserv (ISEN-ASTC-L). More than one-quarter of interviewees said they subscribe to the exhibit builders' listserv Webhead, and slightly less than one-quarter of interviewees said they subscribe to the general museum listserv Museum L. A few interviewees said they subscribe to ChildMus. Other listservs mentioned by single interviewees include AZA, Museum H, AAAS, ICM, a technology listserv called Jacob Nelson's Alert Box, and listservs related to interviewees personal hobbies and affiliations including bike mechanics, creative writing, and college alumni listservs.

When asked what they use the listserv for, many ASTC subscribers described it as a networking tool, a way to keep a finger on the pulse of what is happening in the museum field, and a community builder (see the first and second quotations below). Many of the Webhead subscribers said they use that listserv as a how-to resource for exhibit fabrication and maintenance (see the third quotation). Of the interviewees who said they do not currently subscribe to any listservs, most cited time and a lack of interest in the content (see the fourth quotation).

There is a tendency for your perspective to be inbred and narrow, and so it's a great tool to be informed about wider issues, broader perspectives.

I think, in an interesting way, they're sort of an electronic equivalent of . . . a museum gathering because there is a certain sharing of knowledge that takes place and an opportunity to share your own knowledge as well, but also there's sort of an interesting sort of networking and community thing that gets built up.

[Webhead] It's an exhibit builders listserv so you can write to them and say how do I do x, y, or z? Does anyone know? . . . I think it's really pretty good, but it depends very much on a couple of informed people answering, which they do.

[Why don't you subscribe to any listservs?] Let me see if I can say this right: a very low signal to bandwidth ratio, meaning lots of nothing, with too much other stuff going on.

Of the three-quarters of interviewees who said they are listserv subscribers, slightly more than one-half reported that they typically just scan and read the listserv messages (mostly in digest form), while slightly less than one-half of this group said that they both read and actively contribute to the listservs to which they subscribe. When probed as to why they only read the postings rather than contribute, many interviewees cited time as a limiting factor and expressed a preference for direct communication with an individual (see the first and second quotations below). Some interviewees said that they do not post because they usually lack the answers to the questions posed (see the third quotation). One interviewee shared an anecdote about being telephoned and berated by a fellow museum colleague after having posted an editorial comment on the ASTC listserv about the accessibility of an exhibit. This negative experience colored the interviewee's willingness to join in the community dialogue again (see the fourth quotation).

I don't feel like it's a priority, time-wise [to contribute to listserv]. If I'm pressed for time, I'm going to do my work and personal email directly communicating with people that I know and have relationships with first.

[I don't contribute] because, candidly, I'm drowning in an ocean of email and electronic exchange all the time . . . There simply isn't time to do that stuff. I'm not sure how many more web resources the world really needs to be honest with you.

[Why don't you contribute?] Let's see, because I usually don't have the answers.

I just thought this was an innocuous comment [I made on the listserv] and someone . . . called me up on the phone . . . and started yelling at me about how he'd done everything he could to make that [exhibit] accessible . . . I felt attacked, and that's when I realized that everything you say on there is well documented . . . it's almost not worth it to respond. So when I do respond, I tend to respond to people directly.

Of those interviewees who said they do actively contribute to listservs, several interviewees expressed that they feel it is important to share resources and respond to colleagues' questions when they know the answers (see the first quotation below). One interviewee spoke of the lack of focus of the museum-related listservs and characterized his willingness to post as a hope of growing a more sophisticated community of listserv users within the museum field (see the second quotation).

If I know the answer, or have a suggestion that would help, I feel obligated to [post] because when I request information, someone's doing it for me. I suppose it's also a vanity thing, or maybe an educator kind of thing. I'm a former teacher.

Well, the other non-museum lists [I participate in] are so much more focused and useful, so my participation in the museum lists is in the hopes of growing as a community to make better use of these tools. There is so much potential from what I see in the way people know how to use these tools and communicate, but it's a hard hump to get over, particularly on the ChildMus list. There's very little discussion. There are people crying out for help, there are people providing short answers or hints, but there's very little useful discussion and very little thoughtful, generous giving of knowledge. That's what I

look for. I wish they were more on it, and I'm very appreciative when someone does take the time to contribute in that way.

- *ExhibitFiles Content and Functionality*

*Resource Preferences.* Evaluators asked interviewees what types of information and resources they hope to be available on the *ExhibitFiles* Web site. Most of the interviewees said they would like the Web site to feature overviews of exhibitions, which could include exhibit descriptions, photos, overall budget, goals, schedule/development timeline, funding sources, contact information of exhibit team members, and a list of project advisors (see the first and second quotations below). Many interviewees said they would like access to visitor studies including research projects and all phases of exhibition evaluation. Several interviewees said they are interested in learning about the pitfalls and challenges development teams faced in order to learn from others' mistakes and prevent having to "reinvent the wheel" (see the third quotation). Some interviewees said they would like to see samples of exhibit labels. A few interviewees said they would like the site to include a place for philosophical and pedagogical discussions (see the fourth quotation). A few interviewees said they would like to see a list of upcoming exhibitions that are opening nationwide.

I think some things that would be useful would be information about different exhibitions, both current and historical, and information that you could look up by topic or by audience . . . and see some images of the exhibit and a little bit about what the elements were, what topics were addressed, who contacts might be about the exhibit if you wanted to talk to them.

I would love to get a synopsis of what an exhibition was, what its main point was, any evaluation they may have done, photographs of it, budget, challenges they came across and how they solved them.

I'd like for people to post about the exhibits they've created and what their pitfalls were and how to avoid them.

I'd like the educational framework of an exhibition to be discussed because I find sometimes that disagreements within the museum culture often have to do with differences between people's theoretical frameworks.

Several interviewees suggested that the Web site include information about individual exhibit components as well as whole exhibitions (see the first and second quotation below). On the exhibit level, several interviewees suggested that *ExhibitFiles* include a searchable database of exhibit ideas. Some interviewees were particularly interested in nuts and bolts information about exhibit fabrication including recommendations and sources for materials and parts lists. One interviewee suggested mining the ASTC listserv archives for reoccurring issues and create an FAQ section on the *ExhibitFiles* site. One interviewee commented on the cumbersome interface of the existing ASTC listserv and suggested replacing it with a technical exhibit fabrication and maintenance forum on the *ExhibitFiles* site modeled after Yahoo! Groups.

I would be interested in both exhibitions as a whole but also exhibits, i.e., individual units or components as well . . . . The only reason I say that is that there will be people who could contribute material [to the Web site] who well may not ever be able to contribute

entire exhibitions. I'm thinking especially of the smaller museums, science centers, and children's museums or non-traditional venues who might do things in more of a piece meal basis, but there's still useful information there.

In "Best Practices" [Are We There Yet?] there was made what seemed to me to be an arbitrary decision to focus on the development of exhibitions. It explicitly stated that the publication is not interested in the components of exhibitions considered individually, but that's such an important part of our field, the exhibit elements that you see again and again as you travel around to different museums. I think, to some extent, we're trying to run before we can walk, and we really need to back up and work on our understanding of what makes the individual exhibit a useful experience. When we've got that understood better, we could graduate to curating experiences and putting context and theme and all these middle levels that we are trying to do. So if there were some room in this project to devote attention to exhibits as opposed to exhibitions, I would advise that.

When asked how specific they wanted the information included on *ExhibitFiles* to be, most interviewees suggested that the more specific, the better, although several interviewees expressed concern about intellectual property issues related to freely sharing exhibit specifications. In contrast, one interviewee suggested that, in the interest of efficiency, the contributions to the Web site should be limited to a 200 to 300 word exhibit description, a photo, and contact information. Some interviewees cautioned against overwhelming users with too much information about an exhibit or exhibition and suggested that the degree to which detailed information would be useful for *ExhibitFiles* users depends on how well the site is organized (see the first quotation below). A few interviewees suggested that *ExhibitFiles* contributors conform their postings to a given template, a template structures enough to facilitate comparison of exhibitions yet also allowing space for personal narrative and atypical facets of the project. A few interviewees pointed to the exhibition development narratives included in Kathy McLean's book *Are We There Yet: Conversations about Practices in Science Exhibition Development* as a model for what types of information should be included in exhibition overviews (see the second quotation).

I suppose the problem is just the overwhelm, the McMaster-Carr Web site is huge, what makes it useful is how well organized it is, how efficient it is to get to the particular nugget of information you're looking for but that's a major challenge to organize information in that way. I think there might be ways to benefit from some sort of structure or formal editing of submissions so that they conformed at least and outlined to certain expectations but I'm not sure that would balance.

What was really strong about the case studies in the "Best Practices" book was that there were images of specific exhibitions, personal information that could be a little idiosyncratic from the developers and designers of the exhibition, and then there's sort of standard information that can help compare how big, how much it cost, how long it took, what topics it covered, what the elements were. With that combination of comparative information, you can sort of look at different exhibitions and get the same kind of information, and then also allow room for some idiosyncratic personal take on the process.

*Contributions.* When asked what types of information they would be willing to post on *ExhibitFiles*, interviewees' responses echoed the resources they said they would like to see on

the Web site including exhibit/exhibition descriptions, photos, evaluations, label text, lessons learned, final budgets, conceptual sketches, marketing materials, educational materials, goals, accessibility information, and technical information. Most of the interviewees cited collegial discourse and collaboration as reasons they would be willing to share this information on *ExhibitFiles*. Several interviewees attributed their willingness to share information to their desire to build a learning community and avoid reinventing the wheel (see the quotation below). A few interviewees commented that they already share exhibit information with colleagues upon direct request and that *ExhibitFiles* would simply provide a central clearinghouse for this type of exchange.

If [the information] would help someone else, why reinvent the wheel? I think we're all in this together to educate, and I have no issues with sharing information... I mean, that's what this whole thing is set up to be with the community, to provide collaboration between us.

When asked what information or resources they would be unwilling or hesitant to share, many interviewees listed information they deemed proprietary including detailed blue prints and exhibit drawings, line item budgets, salary information, grant proposals, evaluation instruments, and software code for computer-based exhibits. Several interviewees expressed hesitation in sharing final design documentation and exhibit schematics if contracted with an outside design firm or for an outside client unless (see the first quotation below). Some interviewees said they would be unwilling to post information on *ExhibitFiles* that they would have to spend a lot of time organizing (see the second quotation). A few interviewees said they would be unwilling to share information they intended to sell commercially. Alternatively, in the spirit of open-source sharing of information, a few interviewees said there was nothing they would be unwilling to share (see the third quotation).

We build [exhibits] for a lot of other institutions . . . . We might be a little hesitant to just put up specific schematics of things without getting some sort of permission.

I would be hesitant to share too much because of the amount of time it would take. I don't want to create a whole document. For a traveling exhibit, I'm already creating a document on how to use exhibits and everything, but for an in-house exhibit the documentation is going to be sparse. I'm not going to create a whole document with blue prints for that exhibit. I'm hesitant to put a lot of my time and effort into something that people may or may not use, and I won't get anything back for.

[Is there anything you would be unwilling or hesitant to post?] No, not me; as far as I'm concerned, anybody who has a death grip on their ideas doesn't have enough ideas.

*Response to Comment/Review Feature.* Evaluators asked interviewees their opinions of the idea of creating a community-based forum on the *ExhibitFiles* Web site in which users could comment on and review aspects of an exhibition. Many interviewees responded favorably to the idea and said the benefits would include: providing a centralized clearinghouse of exhibit/exhibition examples; building community; providing lessons learned to spare colleagues from repeating mistakes; inspiring and encouraging innovation; advancing the exhibition development field by encouraging constructive criticism and critical thinking and providing a historical context (see the quotations below).

[What benefits do you see could come from making and receiving comments about aspects of an exhibition?] Oh a lot . . . . Not making mistakes other people have made; finding great ideas other people have had which are sometimes inspiring to take something a little farther; provide a central place to go to find out what has been done.

Build a community of open discourse . . . . The more we talk about practices, the better and easier ideas will be innovated through the field.

Conversely, several interviewees expressed doubt about the success of the proposed comment/review feature of *ExhibitFiles* and pointed to the lack of time of busy museum professionals to participate in this type of online exchange as a major challenge. Several interviewees said there is a potential for hurt feelings and territoriality if the critique discussions turned too personal (see the first quotation below) and suggested that providing constructive critical feedback is a skill few people know how to do well. Some interviewees said that another challenge with the comment/review idea is how *ExhibitFiles* can attract a diversity of regular users in order to avoid the site becoming a forum for the most vocal and well established in the field. A few interviewees pointed out failed attempts by the TEAMS Collaborative to elicit participation in a reportedly similar type of community online dialogue (see the first quotation below). One interviewee cautioned that it is difficult to extract useful information from a listserv forum model of ongoing comments and dialogue and suggested that *ExhibitFiles* follow the wiki interface model (see the second quotation below).

Are people going to have time to do that? When we tried it with the TEAMS Collaborative, these were all people that we knew, and none of us really sat down and posted a lot of comments about the other exhibits because we were all so busy.

One of the biggest problems with forums is that they become this kind of ephemeral stream that if you read it all constantly, like a listserv, you can follow a particular conversation. That's very nice if you follow the conversation, but if you come in at a later date, you have all of these messages to plow through that otherwise don't really add up to anything. The alternative model of that is the idea of the wiki, which is that there's this permanent artifact created by a group of people that both can be edited and contributed to and grows. It has lasting value as a reference tool and as a point of entry for newcomers who aren't necessarily following every twist and turn on the discussion. With something along those lines, particularly around a particular exhibit or around topics of different best practices, you could basically build up a repository of information that would have both community value and reference value . . . . Like I say, forums can, unless you're following it very closely, be very hard to extract usable information.

Several interviewees suggested that the site would benefit from having an editor to monitor the conversation and keep the site fresh (see the first quotation below). Some interviewees said that only deem credible comments from people who physically visited the exhibition being critiqued (see the second quotation).

I think it's really important to have an editor for the site who is monitoring the conversations to ensure that they're going in a constructive direction. It will be very exciting if people challenge each other and all of that, but I think you wouldn't want to feel like people's professional reputations were being affected, that, I think, would put the site at some risk. The other part to why I think an editor would be important is to

coordinate or facilitate new things happening . . . . Some blogs work this way—sites where there’s someone writing about a particular thing every week or every couple of weeks that could start a conversation about that issue. It’s a way of really keeping the conversation fresh and focused and interesting for people; bringing them back with something new; getting someone who is really a good thinker about the subject to start it off, and that draws other people into the conversation.

I think the weight and the value of those sort of comments would only come from someone who actually saw or experienced the component or entire exhibition in person. I mean, to comment on a picture or description is pretty much pointless.

When asked what aspects of an exhibition would be useful to give and receive comments on, most interviewees pointed to either issues of accessibility and usability or whether the exhibition effectively communicated its big idea and messages. Several interviewees said it would be useful to critique the effectiveness of the exhibit labels, and some suggested that *ExhibitFiles* developers provide users criteria for judging an exhibition rather than encouraging open-ended opinions (see quotation below).

I was involved with Beverly Serrell’s you know . . . . What was it called? [Excellent Judges?] Yeah, her expert reviews. It was less about opinions and more about reviewing an exhibition with various criteria. I would prefer to have something like that rather than just writing opinions. [vice president of science, medium-sized science center]

When asked what would motivate them to post a comment on an aspect of an exhibition, most expressed a willingness to share their knowledge and make a contribution to the community dialogue. Some said that they would be motivated to post a comment about an exhibition if they had visited it in person. Other interviewees’ responses to what would motivate them to post were idiosyncratic including the following: receiving an email reminder about the site; seeing misinformation in an exhibition; having a poor experience at an exhibition would motivate them to post a comment about it; and to celebrate the successes of institutions tackling issues of universal design and accessibility. As to what would keep them from posting a comment or review on *ExhibitFiles*, most interviewees cited a lack of time as the biggest limiting factor. Several interviewees said they would be unmotivated to post if they perceived the other comments on the site as too general to be useful, shallow and vacuous, or, on the other, if the site became a dumping ground to pick apart others’ work (see the first quotation below). Some interviewees expressed a fear of their comments being perceived as whiny or offensive, while some said that the conversation digressing into a political rant would be a deterrent to post comments on the site (see the second quotation).

What I don’t want this to become is a mutual admiration club where everyone is saying everything wonderful about an exhibit. I also don’t want it to be a dumping ground: ‘oh they did this really bad, they did that really bad.’ I’m hoping it’s going to become a mix of comments, so that when people are giving critical comments, they’re really thought through and substantiated and not just, ‘I didn’t like this, this is bad’ kind of thing. I also just don’t want it to be some big ‘we all love each other and this is all wonderful’ fest.

I feel nervous . . . about making a negative critique about something both in terms of how will the people who worked very hard on it feel, and then also how will I look. Will I look like a whining exhibit professional? I want to make sure I come across as having something worthwhile to say, and that I’m not just being negative.

When asked their opinion about the option of users to leave anonymous comments on the *ExhibitFiles* Web site, most of the interviewees said they would prefer that users always identify their comments by name to help maintain accountability and a professional tone on the site as well as provide an opportunity to generate discussion among identified colleagues. A few interviewees were mixed on the topic (see the quotation below), and a few said that, despite being a controversial stance among colleagues, they felt users would be more candid and open if given the opportunity to leave an anonymous comment.

I can see it both ways. It makes me crazy when someone says they don't like something if they won't leave their name because then I talk to them further about what they didn't like and how it's changed to make it better, so I kind of feel like it's a cop-out by that person if they're not willing to put their name on it. But then I could also understand some people may not want to put their name on it because then they don't want to be, oh you're the one who didn't like y and z.

*Overall Advice for Developers.* Evaluators gave interviewees an opportunity to offer overall advice to the developers of *ExhibitFiles*. In the spirit of iterative development, many interviewees suggested circulating the first iteration of the site widely to elicit feedback from a representative group of users. Several interviewees offered technical usability advice including ensuring that the site loads quickly and that the design supports navigating to various parts of the site quickly. Some interviewees suggested including a function to notify users about new content on the Web site.

### **Appendix: Interview Guide**

With a grant by the National Science Foundation, ASTC is currently in the process of developing a community-based collaborative web site for the exhibit field. The Web site will be called *ExhibitFiles*. The core planning team includes Kathleen McLean, Wendy Pollock of ASTC, Jim Spadaccini of Ideum, and 17 exhibit practitioners and advisors, including representatives of NAME, who will help to build and test the site.

Records of exhibitions—from titles and opening dates to outcomes and lessons learned—will form the core of the site, which will also take advantage of recent developments in web design to provide ways for registered site users to not only quickly retrieve information about exhibitions, but also to contribute, comment, and critique. We are developing a set of interviews to inform the design, content, and format of the site.

We will be audio recording and transcribing the interviews to ensure accuracy. Do we have your permission to record? [If yes] Do we have your permission to identify your comments by name or do you wish to remain anonymous?

1. I'd like to ask you some questions about the exhibition process, which may include design, fabrication, management, and/or maintenance.

Please describe your particular role in the process. [Probe interviewee to be specific]

Please list the steps involved when your institution is developing a new exhibition and be as specific as possible. These may include aspects of exhibition development that you are not involved with.

Does your institution have a specific method for organizing/documenting the process – maybe a way of categorizing different tasks, etc? Please tell me about this.

Please list some typical challenges your institution faces during the exhibition development process.

What sort of information/ideas do you typically look for to inform the exhibition development process? What is your goal in seeking out that information? [probe to see if they look at other exhibits.]

What resources do you use for finding this information?

2. Now, I'd like to ask you more generally about the exhibition community at large.

Do you belong to and participate in any professional associations or other similar type of groups? Please tell me about that.

What do you hope to gain from these associations/groups (probe for experiences, advice, judgments, perspectives)?

What form do you prefer these interactions take (i.e., telephone, conferences, email, Web sites, etc)?

3. Next, I'd like to ask you about your use of the Internet.

What is your primary reason for using the Internet, which may include email and the web (personal and/or professional)?

Can you give me an example of a Web site you visit often and find trustworthy? What makes it trustworthy?

[If not already mentioned] Do you subscribe to any professional list-servs? [If yes] Which ones? What do you use them for?

How helpful have you found Internet resources, including email and Web sites, for exhibition development?

In your use of these Web sites/list-servs (personal and professional) do you typically just read/search for information or do you actively contribute to the site in some way? Why?

4. Now I'm going to ask you some questions specifically about *ExhibitFiles*. The designers of the Web site hope to build a community of users who share information and resources.

As a user of *ExhibitFiles*, what types of information/resources would you hope to be available? How general or specific would it need to be—Please give me examples? Why?

What do you want to know about what other people have done? Why?

Can you give me some examples of information and/or resources (i.e., floor plans and photographs) you or your institution would be willing (and able) to post on *ExhibitFiles*? Why?

Is there anything you would be unwilling or hesitant to share? Why?

5. The designers of the site also hope to build a community of comments/reviews so that institutions would post information about different aspects of an exhibition and the community of *ExhibitFiles* users would post comments. One way to think of this is Amazon.com or Epinions.com. If you are familiar with either you know that individuals post reviews of products on those Web sites. Now, when I say “aspects” of an exhibition, I mean, for example, accessibility features or materials (i.e, materials, technology, evaluation, designers, goals and objectives statement). In other words, users would not comment on an entire exhibition, but an aspect of an exhibition.

What do you think of this idea? What aspects of an exhibition do you think would be useful to give/receive comments on? Why?

What would motivate you to post a comment? What would keep you from doing so?

What benefits do you see could come from making/receiving comments about another institution’s exhibition/aspects of an exhibition?

What sort of issues or challenges do you see arising from this idea?

Can you think of ways these comments could be done in a way that builds trust within the community? For instance, would you prefer that comments always be identified by name or that users have the option to leave anonymous comments?

6. Now, I’d like to give you a chance to offer any overall advice for developers of site.

7. Lastly, I have a few quick questions.

- Name
- Institution
- Size of institution (small, medium, large)
- Title/position/role in exhibit process
- Number of years in the field
- Rate Use of Internet

Use email only 1                      2            3            4            5 *Contribute regularly to list servs and community Web sites*

- Permission to identify comments by name in report and/or published article  
Willing/unwilling to provide ASTC with documentation of exhibition development process.

