A Survey of Museums on the Web: Who Uses Museum Websites?

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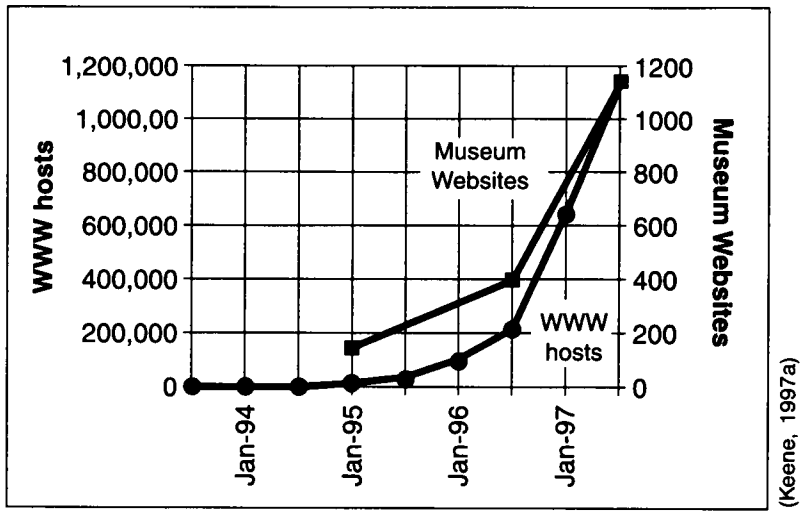
ABSTRACT **The Internet is a means of global communication that has revolutionized the dissemination and retrieval of information. As the public becomes technologically savvy, museums have the opportunity to use new technology to expand their reach. This article profiles both the average Internet user and average museum Website visitor. The Internet has the potential to amplify enrichment by making museums more universally accessible.**

INTRODUCTION

Computer technology and the Internet have enhanced the capability of museums. The Internet provides museums the added ability to reach millions of people—in many cases people who may not have had access to museums and their collections. *"It is little wonder that museums are seizing upon this opportunity to extend their influence into the community and raise their profile at a relatively low cost"* (Reynolds, 1997).

Museum Web use has increased substantially since 1995. According to the Virtual Library of Museums, museum use of the Web is following the same growth curve as other Internet statistics (Keene, 1997a) (Figure 1).

Figure 1. Growth in museum Websites



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Museums are using Websites to supplement their presentations with additional information and activities that could not be delivered otherwise. The Web, in effect, gives museums a second, virtual life. Interactivity, exploration, and virtual experience do not replace, but complement, the physical museum. Interactivity *"is the single greatest contribution that Web technology has to offer the museum field—and the least exploited. . . . No other forum available to museums . . . allows us two-way communication with such a large, eclectic audience at such a nominal expense"* (Glasser, 1997).

EXAMPLES OF WEB-BASED ACTIVITIES

The site developed by Glasser at the Virginia Museum of Fine Arts includes a section entitled *"You're the Expert."* Visitors are presented with a real issue facing the museum and asked what strategy they would use to approach and ultimately solve the problem. The goal was to engage the Website visitor by demonstrating the kinds of issues museums face every day. In the process, the museum was able *"to interactively engage the visitor, to extend their educational mission to the Web environment, and to exploit the interactivity of the Web in a way that provides the museum with information of their on-line audience"* (Zorich, 1999). This museum's approach to Web designing reinforces the idea for the visitors that the site—and by extension the museum itself—is accessible. Ideally, this interaction enhances the public's interest in and respect for the museum.

Websites are as individual and varied as actual museums—visitors to museums on the Web can tour ancient Mayan villages at one site and learn how to dissect a cow's eye at another. The Science Museum of London, a pioneer in Web-based museum activities, has developed the Students and Teachers Educational Materials (STEM) project.

This project was developed to make it possible for students to create their own Web-based work with assistance from the Science Museum staff. Ideally, this project permits an on-going conversation and a porous relationship between the museum and the students. The STEM project has taught staff important lessons. First, the staff realized that schools do not sufficiently exploit the resources that the Web has to offer. They also found that their accessibility, assistance, and receptivity to constructive criticism concerning the quality of the project is important. Finally, they learned that while the reputation of the institution depends on the quality of the project, the ultimate goal is to enhance the educational benefit that people get from the visit—in reality and on-line. The future of on-line projects like STEM will depend on both museums' and students' ability to work together.

SURVEY OF INTERNET USERS

General surveys portray the characteristics of Internet users in general (Georgia Institute of Technology, GVU 1998). These characteristics (detailed below) can be compared to those for museum Website users to reveal areas in which additional outreach efforts need to be made by museums.

Demographics—The rapidly changing demographics that mark the Internet's expansion make it difficult to profile the average Internet user. Demographic studies of computer users find that they are typically well educated, wealthy, overwhelmingly Caucasian, and thus not reflective of the world population (GIT/GVU, 1998). The statistics that follow give more detail to those summary characteristics of Web users. These will then be compared with the findings of the International Museum and the Web Survey. This comparison will allow a more complete understanding of the average museum Website user.

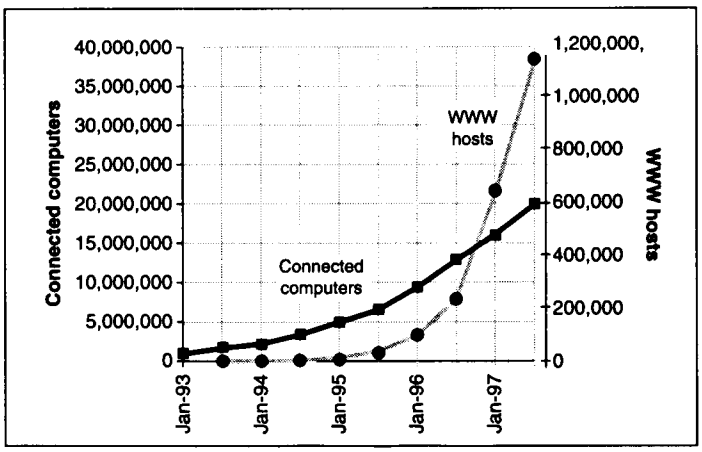
A Nielsen survey in the fall of 1997 documented 52 million people accessing the Internet in the United States and 6 million in Canada. Of that number 45 million people in the United States and 5 million in Canada were surfing the Web (Nielsen Media, 1997). An NUA survey completed in August 1998 found that 130.8 million people worldwide are actively surfing the Internet (Table 1). A breakdown by region shows that in Africa there are 800,000 users, Asia/Pacific 19.3 million, Europe 32.5 million, the Middle East .75 million, Canada and the United States combined 70 million, and South America 7.25 million (NUA Internet Survey, 1998). There are now 4,290,778 registered domains worldwide with a "current weekly growth rate of 60,780" (Netnames, 1998). *"The number of computers that have Internet connections, direct or by service provider and modem, is still increasing by about 80 percent each six months"* (Keene, 1997a). Moreover, this growth curve shows no sign of slowing down (Figure 2).

Table 1. Internet use by region, August 1998

Africa	0.8 million
Asia/Pacific	19.3 million
Europe	32.5 million
Middle East	.75 million
Canada/U.S.	70.0 million
South America	7.25 million
Total:	130.8 million

(NUA, 1998)

Figure 2. Connected computers and WWW hosts



(Keene, 1997a)

The Georgia Institute of Technology has documented trends in internet user demographics and preferences for four years (GIT/GVU, 1997). This survey examines gender, education, age, geography, occupation, race, disability, income, and hours spent surfing the Web.

The GVU findings as of April 1998 show the traditional gender gap closing, with 38.7% of international respondents being female. In the United States, the percentage of women accessing the Internet is slightly higher, ranging between 40% and 43% (GVU, 1998a; Nielsen Media, 1997; Webb, 1996), a sizable leap from the 5% recorded in January of 1994. In Europe, males outnumber females, 83.7% to 16.3%. The percentage of male users increases with each age group, while the opposite holds true for women. Of the users having less than a year of experience on the Internet, women outnumbered men at 51.7%. Conversely, among users having four or more years of experience, men (70.3%) outnumbered women. Forty-five percent of all respondents had at least one to three years of experience.

From 1997 to 1998, the average level of education of users declined. Respondents who had "some college or more" dropped from 83.5% in April of 1997 to 80.9% in April of 1998. Those who had "college or more" also declined from 54.2% to 50.1% in the same period. The respondents who had four or more years of experience surfing the net were more likely to hold higher degrees.

The average age of Web users internationally was 35.1 years. Respondents over 40 years of age increased from 34% to 36.4% over six-months time. In Europe respondents were significantly younger, with the majority of users falling within the 21- to 30-year-old range. This profile of European users is almost identical to the general profile in 1994 and similar to the U.S. profile before major access providers became available (GVU, 1998a).

Of those who responded, 26.2% held positions in the educational field, and 22.3% held jobs in computer-related fields. Respondents in the professional field ranked third with 21.7%, followed by 11.2% who occupied positions in management.

The overwhelming majority of Web users, 87.4%, classified themselves as White. Of the remaining respondents, 3.1% were Asian, 1.8% were Black, 1.5% were Hispanic, .8% were Latino, and .5% were Indigenous. A combined total of 4.8% would either not say or categorized themselves as "other." Nine percent of the respondents had some kind of disability or impairment. The average income dropped from $53,000 (US) in the eighth survey to $52,500 in the ninth. Respondents who earned over $50,000 annually (40.2%) were more likely to be male, American, 50 years of age or older, and experienced at surfing the net.

Twenty-six percent of respondents spent 0-6 hours surfing the Web per week, 47.70% spent 7-20 hours, and 16.40% 21-40+ hours per week. (These results do favor those individuals who spend over 10 hours weekly surfing the net, because extended hours of Web surfing increase the likelihood of encountering the survey.)

The profile of the average Web user, as drawn from these results, is a white male, approximately 35 years old and an American citizen, with an annual income of at least $50,000 a year, who spends about 15 hours a week on the Internet, works in the education field, and has at least some college experience (Table 2). Users are becoming

"more diverse in terms of age, gender, and occupation" (Net-surfer, 1996). Though we can see phenomenal growth in Web usage from the time it was first developed in 1990, the statistics of the average Internet user still do not reflect the complexity and diversity of the global community.

Table 2. Profile of internet users

Profile of Average Internet User	
Gender	Male
Education	Some college+
Age	35.1 years
Geographic location	U.S.
Occupation	Education
Race	White
Income	$50,000
Hours spent on-line	15

(GVU survey, 1998a)

Two newer surveys provide additional data on Internet usage. According to the NUA survey of 1999, there has been a 12.29% increase in Internet usage. Twenty-two million more individuals accessed the Internet worldwide in September 1999 than in June 1999, bringing the total number to 201 million (NUA, 1999). The Computer Industry Almanac predicts that 490 million people will be on-line by 2002, and at that rate of increase, 118 of every 1,000 people will be on-line by the end of 2005 (internet.com, 1999).

The Georgia Institute of Technology's current survey documents ongoing changes in Internet demographics. There has been some backsliding in the percentage of female respondents when compared to the previous two surveys (38.7% ninth, 38.5% eighth) (GVU, 1998b). The percentage of those with high education levels increased by approximately 7%, with 87.8% of individuals stating that they had "some college experience," and 59.3% having "obtained at least one degree. The percentages reverse the trend of decreasing education levels . . . observed over the past 4 years" (GVU, 1998b). Respondents are still predominately Caucasian (87.2%). The average age of individuals increased to 37.6 years. Married individuals comprised 47.6% and single persons 31.7%. The geographic distribution remained much the same. The average yearly income increased from the past two surveys, with an average of $57,300 (US). Individuals that access the net for 0-6 hours increased to 26%, while those that access the Internet for 21-40 hours weekly decreased to 26.40% (GVU, 1998a).

MUSEUM WEBSITE USER SURVEY

How do the numbers above compare with those for users of museum Websites?

Survey Design—A survey was designed to collect data on the demographics of average museum Website visitors and their perceptions of these sites. The questions first asked about the impression respondents had of the museum Website they visited. Demographic data were also collected. The survey was designed to easily compare its results to Reynolds (1997),[1] which explored museum Websites and the role they play in educating the public, as well as surveys on general Internet users.

The survey was conducted solely on the Internet, which limited the respondent pool. Responses were also limited by the placement of the questionnaire

(announcement). Descriptions were posted in the following outlets: the Virtual Library Museum Page Website; the Dejanews newsgroup site; several Cyber Cafes in London and New York City; several university computer labs; university and local libraries; the list serve for the biology and psychology sites at the University of Maryland, College Park; and the email accounts of the entire student body at the Institute of Archaeology, University College London. Signs were posted at the Museums and the Web Conference in Toronto, and news of the survey also spread by word of mouth.

Each survey was marked with date, time, and a remote IP address for identification (Gray, 1996a, 1996b). These formed the basis of a validity test to ensure single responses from individuals. The likelihood that a series of individuals decided to respond using a single host within a matter of minutes/hours/days is highly unlikely. Through this filtration process, any responses that lent the appearance of being less than genuine were disregarded.

Survey Results—Of the 711 responses received, 600 were usable, yielding a return rate of 84.3%. Of those valid respondents, 144 had not visited an actual museum Website; thus statistics for questions 4 through 25 were based on the responses of the 456 respondents who had visited a site. These 456 respondents comprised 76% of the total surveys received.

Eighty-seven percent of respondents had previously visited a physical museum, but only 76% of the individuals had visited a museum Website. When asked in the survey which computer Website they had visited, one respondent stated, *"Any that I can find, I love it. I live in a small mountain community and having this resource is great"* (Sarraf, 1998). Another individual remarked, *"[I visit] a lot in the world just for my curiosity"* (Sarraf, 1998).

Asked if it was the intention of the museum Website user to visit the site when they sat down at the computer, 69% responded in the affirmative. The majority of people who visited a museum Website intended to do so.

An overwhelming majority of respondents, 85%, enjoyed their museum Website experience. Only 10% of the respondents claimed that their visit had not been enjoyable. The percentage of those expressing enjoyment was very close to those who said they would visit that particular site or another museum Website again, 87%. One individual responded,

> [e]very one I can find and find time to visit. This is my favorite use of the Web. My bulletin board at work is always updated with new works that I print from the Web. It makes my life so much richer than it would be without this resource. I live in a small mountain community in the American west. I am poorly paid and long for travel, the Web is my travel agent. And, I visit whenever I can find the opportunity (Sarraf, 1998).

Eighty-three percent said that they had learned something new. Zorich (1999) noted that museum sites have been accused of being nothing more than electronic brochures, marketing tools, or "pretty pictures." But this finding suggests that museums are communicating information through their Websites.

The survey data suggest the real possibility that museum Websites will encourage visits to museums. Seventy-one percent of the respondents stated that their visit to a museum Website encouraged them to visit the actual physical museum. The Science Museum of London has reported, *"our site creates a good impression for most respondents, reinforcing a desire to visit the real museum or reminding previous visitors how much they enjoyed it/ought to go again. . . . In more than one half of cases, respondents are more likely to visit the museum having seen the site"* (Science Museum, 1998).

Seventy-five percent of the respondents said it was easy to navigate through the site they visited. While the Web surfing experience of the respondent may influence his or her ability to navigate a site, these numbers may reflect the overall quality of the Website's design as well.

Eighty percent of respondents reported that sites were aesthetically pleasing. Yet when asked what would make the museum Website experience more fulfilling, 34% stated, "better graphics" (Table 3). One respondent claimed that *"most museum sites have badly integrated graphics and too much text for the average surfer"* (Sarraf, 1998). Since the next highest response category obviously represented individuals who wish to see museum collections on the Web, it is clear that improved graphic imaging is essential.

Table 3. Suggestions for museum Website improvements

What would make the museum Website experience more fulfilling?	Percent
More activities & experiences	8.55
More information on the artists	6.36
More information on the museum	16.67
More information on upcoming events	2.41
More information on collections	25.44
Better graphics	34.21
No response	8.38

Sixty-one percent of respondents "had expectations fulfilled" by their visits to the Website. Unfortunately, the survey did not determine the nature of those expectations.

The Science Museum of London survey found that directory sites, links (for overseas visitors), and articles (in print) are the primary draw for visitors to their site. They also found that 62% of respondents viewed five or more sections, and 14% browsed nine minutes or more.

Question 13 asked whether the individual accessed the museum Website because he or she had special requirements, such as disabled access. Twenty-two percent stated, "yes," although this statistic may reflect many definitions of "special requirements."

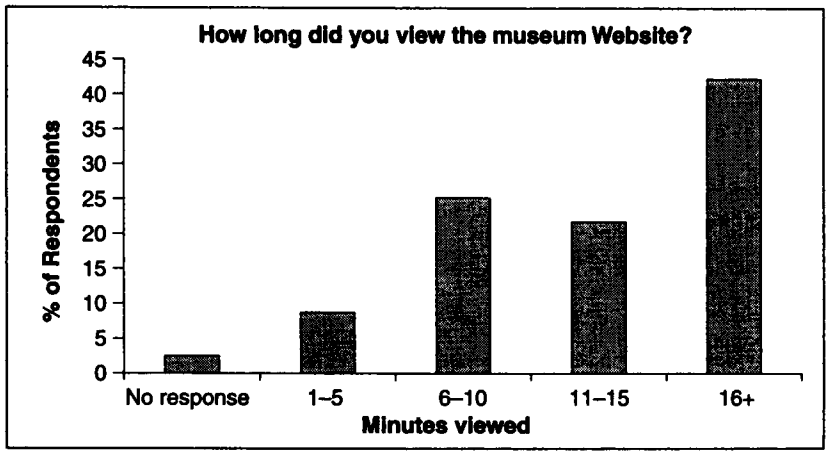
Forty-two percent of respondents viewed the museum site for 16 or more minutes (Figure 3). Just over 25% of respondents viewed the site for 6-10 minutes, while 21% viewed it for 11-15 minutes. Altogether, a large percentage of visitors spend a substantial amount of time reviewing museum Websites.

Table 4. Expectations

What did you expect to find on the museum Website?	Percent
Research	10.31
Membership information	.22
Collections	41.23
Timetable	12.72
Brochure	31.14
No response	4.39

Question 15 asked respondents about their expectations when they visited the site (Table 4); 41% expected to view

Figure 3. Duration of Website visit



the "collections." Reynolds (1997) also found that the majority *"of people expect to find on-line exhibitions when visiting museum Web pages."* Thirty-one percent of respondents expected to find some form of virtual brochure for the museum, reflecting an understanding that museum Websites are used to advertise the museum and its collections.

Sixty-seven percent of the respondents stated that the benefit to them of accessing a museum Website is the satisfaction of their personal interest (Table 5). Reynolds (1997) found similar results: *"the most common benefit chosen for accessing museum Web pages is to explore a personal interest."* One individual echoed this sentiment, responding that *"I am just discovering these virtual vacations—and how much fun they are."* The second most common benefit that respondents (18%) offered was *"seeking research information."* Combined with the 1% of respondents who use the site to locate teaching material, the responses indicate that almost 20% of respondents visit a museum site for educational purposes.

Table 5. Perceived benefits of a museum Website visit

What do you believe are the benefits to accessing a museum Website?	Percent
Research information	17.08
Flexibility of access	2.41
Locate teaching material	1.32
Locate information on museum	5.04
Obtain museum information before visit	2.63
Personal interest	67.11
No response	3.51

Demographic Profile—The remaining questions, numbers 18 through 25, sought demographic information, so as to draw a profile of the "average" museum Website visitor.

Age. Twenty-seven percent of survey respondents were between the ages of 41 and 55, followed closely by 27% between the ages of 22 and 30. In the GVU survey the largest number of respondents were in the 22- to 30-year range (31%), while those in the

41- to 55-year range comprised 26% of the total respondents (Table 6). Museum Website visitors tend to be older than general Internet users. This finding is consistent with the demographics of actual museum visitors (Merriman, 1989). This suggests that the Web is a potential vehicle for attracting a new, younger audience that shares other demographic characteristics with museum members.

Table 6. Age comparisons

Age group	Museum Website survey (percent)	GIT/GVU survey (1998a) (percent)
10 — 16	3.29	2.10
17 — 21	7.24	10.90
22 — 30	27.19	30.90
31 — 40	21.93	21.70
41 — 55	27.41	25.80
55+	10.96	—
No response	1.97	—

Gender. Sixty-four percent of the respondents to the museum Website survey were female, yet another difference from the general internet users in the GVU survey; however, the majority of museum Website users (53%) were located in North America. Again, the gender statistics for museum Websites are similar to those for actual museums.

Education. When asked their level of formal education, 30% stated that they were still studying. The respondents were generally well educated: 25% had their B.A./B.S., 23% had a M.A./M.S., and 11% completed their Ph.D./M.D. The GVU survey (1998a) had similar findings, with one-half holding a college degree or more and 81% with "at least some college" (Table 7).

Table 7. Educational level

Highest education level	Percent
Grammar school	1.75
High school	5.48
B.A. / B.S.	24.78
M.A. / M.S.	23.25
Ph.D. / M.D.	11.40
Still studying	30.48
No response	2.85

Occupation. Occupations were more diverse. Twenty-seven percent held positions in the museum. Students were the second largest group, 18%, followed by educators, 12%. These results basically are consistent with Reynolds (1997), although this survey showed far more in the museum field.

Time on Web. In the present survey, the largest group of visitors, 27%, stated that they surf the net for one to two hours weekly; 23% are on-line for three to four hours weekly. These figures are quite different from the general Internet user profile of the GVU survey (1998a), which found that 47.7% of respondents (the largest group) spent 7-20 hours on-line each week. This finding may be explained in part by the younger age of the typical GVU respondents (Table 8).

Table 8. Time spent comparisons

Hrs/wk on-line	Museum Website survey (percent)	GIT/GVU survey (1998a) (percent)
1 — 2	26.66	26.00
3 — 4	22.81	
5 — 6	17.54	
7 — 10	12.50	47.70
10 — 15	8.66	
16 — 20	4.17	
20+	7.02	26.40
No response	1.75	

Income. Thirty-six percent of respondents reported an yearly income of $11,000-49,000(US). Those who earned $0-10,000 comprised 21% of respondents, while those who earned $50,000-100,000 comprised 24%. These results are similar to those found by the GVU (1998a) survey, where 38% earned between $10,000 and $49,000 annually. The present survey, however, had a slightly higher percentage of respondents stating that they make less than $10,000 per year (Table 9).

Table 9. Income comparisons

Yearly average income (x $1000)	Museum Website survey (percent)	GIT/GVU survey (percent)
0 — 10	21.05	42.80
11 — 40	36.18	
50 — 100	24.34	40.20
110 — 500	4.17	
500+	1.32	
No response	12.94	16.90

Ethnicity. Most respondents to the present survey were Caucasian (70%). The GVU survey reported that 87% of its respondents were Caucasian. The museum Website survey has a slightly higher percentage of Asian respondents (6.14%), as well as a significantly higher percentage of respondents who classified themselves as "other" (13.6%).

CONCLUSION

The survey findings suggest that the "average" museum Website visitor is female, holds a degree in higher education, is approximately 36 years old, is from North America,

occupies a job in a museum-related field, is Caucasian, has an average annual income of $53,520 (US), and spends an average of 7.50 hours a week surfing the Web. Thus, a comparison of the average Internet user with the average museum Website visitor, reveals that they are, for the most part, the same. Visitors to both are predominantly Caucasian, American, fairly wealthy, close to middle age, and have at least some higher education. The primary differences are that the visitors to the museum sites are more likely to be women and more likely to work in the museum field (Table 10).

Table 10. Profile comparisons—A summary

Category	Avg. internet user*	Avg. museum site visitor+
Gender	Male	Female
Education	Some college+	College and more
Age	35.1	36.46
Geographic location	U.S.	North America
Occupation	Education	Museum-related
Race	Caucasian	Caucasian
Yearly income (US $)	50,000	53,520
Hours/week spent on-line	15	17.5

* GIT/GVU Survey, 1998a
+ International Internet Museum Survey, 1998

The Internet has opened a new avenue of communication between the museum and its patrons. The activities provided by museum Web pages allow for new museum experiences. Individuals can interact with museums on their own terms, providing unique opportunities for informal learning. Websites give visitors the chance to revisit images they have seen in museums, reinforcing the visitor experience. Similarly, Websites can entice visitors to make the effort to see the collections of museums. The Web will facilitate a knowledge of collections and insights into the collecting process that are often beyond public access (Thornes, 1996). The Web permits this dialogue with the public because within the confines of the site, it is the visitor who determines the extent, level, and terms on which the museum Website will be accessed. Larger museums, whose Websites are visited most frequently, could use the Internet to give visitors an option to connect to smaller specialized museums, which may not be as well known.

The Internet provides freedom by setting *"up a space which cannot be understood as hierarchical, as setting up a distance between a center of power and its periphery"* (Witcomb, 1997). As purveyors of knowledge and repositories of cultural heritage, museums can exploit Web technology to expand their roles as public educators. The results of this survey demonstrate that an informed and interested audience is receptive to the efforts by museums thus far. It is incumbent upon museums to use this information to craft Websites that will satisfy and, indeed, challenge this audience in the future.

The results gathered from this survey can provide information that allow museums *"the opportunity to redefine what meaningful knowledge exchange within the*

profession means, and to discover what outside 'clients' want to find when they search cultural heritage information" (Sledge and Bryan, 1996). Additionally, these same findings clarify the path that museums must take in order to ensure their role as institutions for the public good.

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NOTES

1. An M.Sc. dissertation project conducted at Leicester University,