

AN ANALYSIS OF PUBLIC GARDEN WEBSITES

by

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ABSTRACT

Over 38 Million Web sites are now available for on-line viewing. Public gardens are a small portion of this astonishing number and are increasingly using the Internet as a means to inform the public of their presence, including their mission, collections, and programs. Likewise, the information provided on a public garden's Web site may educate, entertain, and encourage the user to become involved with the garden through visiting or donating their time or money.

The purpose of this research was to analyze and describe the current use of Web sites by public gardens in the United States. Surveys to admissions-charging public gardens with Web sites offered insights into the garden's Web site creation and maintenance processes and content decisions. The development, maintenance, content, and methods of analysis of individual public garden Web sites show trends in the following areas: development costs and time, maintenance frequency and associated costs, types of staff used for site content development, design, and maintenance, methods of enriching a site's content through links, plug-ins, and interactive features, and the methods used to determine a Web site's usability. Results indicate that the majority of institutions have had Web sites for over 2 years, spent under twelve months in planning and development, and spent less than 300 hours and \$2000 to create the Web site. Many Web sites were created using much less time and money resources, meaning that Web sites should be achievable for most

public gardens. A majority of Web sites are maintained and updated either monthly or seasonally for under \$2000. Thirty-one percent of Web sites have been analyzed for usability via focus groups, interviews, or some other method.

Additional research on Web design uncovered key characteristics found in an effective Web site. Key design issues include navigation, page layout, and content of main and subsidiary pages. Well designed Web sites are eye-appealing and easy to navigate in order to find the desired information quickly.

Web sites can be improved by increasing the content available on-line, the quality of the design and navigation, and by having realized goals and purposes. Usability testing can help an institution determine users' needs and aid in the process of site improvement. A Web site can serve as a marketing tool while also educating the public on the garden's mission.

Chapter 1

INTRODUCTION AND METHODS

The past ten years have seen the astronomical growth of the Internet as a tool for marketing items. From selling computer software to showcasing travel destinations, there are numerous organizations using Web sites to promote goods and services. Public gardens also have become a portion of the over 38 million sites on the World Wide Web as reported by Robert Zakon's Web site. In August 2000, 41.5% of households (or 94 million people) had Internet access according to the U.S. Census Bureau. This creates an opportunity to reach a large number of people relatively efficiently and inexpensively. Public gardens can be compared to other organizations that are creating powerful presences on the Internet, such as museums, zoos, and other travel destinations.

The Internet can be a powerful tool when used well. There are many items which go into the creation of a Web site – items which need to be considered prior to the actual creation – in order to assure successful communication with the Web site's target audience. The design of the site's appearance, navigation systems, content, and methods of analysis all need to be considered during the planning stages of a Web site.

The overall design of a Web site is the first item a user will see when visiting a Web site. "One of the main goals of a great Web design is to establish your

credibility as a professionally run operation” (Nielson, 2000, p. 92). This first impression will determine whether the user will continue further into the site or return to more familiar territory. Design includes the use of color, layout, fonts, navigation systems, and graphics (Bradley, 2001, pp. 6-7). Travel destinations often show colorful images of their site; zoos show exotic animals; museums showcase images of their most prized artifacts. A public garden should be able to follow these leads and create a positive image of itself as a destination.

Once someone has found a Web site eye-pleasing and navigable, the search for information will occur. If the Web site offers no valuable content, then the user may leave and go elsewhere (Flanders and Willis, 1996, p. 52). The question of what types of information a public garden can offer is important to consider. Should a public garden’s Web site be a copy of their brochure or can it be much more? Other travel destinations have used their Web sites to provide meaningful information which makes planning travel to their sites easier. Contact information, maps and driving directions, weather information, and nearby accommodations and attractions may help draw a potential visitor to travel to your site. Many museums have successfully found ways to educate their virtual visitors by providing collections information, images of art and historic artifacts, and invitations for learning opportunities through courses and lectures. “More recently, museums are offering information and materials that support their pedagogical mission. Many sites now contain educational materials for users and curricular materials for teachers” (Jones-Garmil, 1997, p. 174).

Once a Web site has been created, how can its success be determined? There are numerous methods of analysis to determine how the user perceives and uses the Web site (See Appendix C, p. 78), including studies in usability. Usability is defined as:

“the broad discipline of applying sound scientific observation, measurement, and design principles to the creation and maintenance of Web sites in order to bring about the greatest ease of use, ease of learnability, amount of usefulness, and least amount of discomfort for the humans who have to use the system.” (Pearrow, 2000, p. 12)

Guidelines for accessibility, a component of usability, should be followed to make Internet use easier for people with disabilities. Types of barriers which can be eliminated with accessible design include visual, hearing, physical, and cognitive or neurological disabilities (<http://www.w3.org>). These processes, when applied to a Web site, can find information which would otherwise remain unknown. Through these methods of analysis, site improvements can be made which will increase the ability of the Web site to be used as a public relations mechanism for the garden, improving the opportunity for successful communication.

The purpose of my research was to identify the design, development, maintenance, content, and analysis issues prevalent in public garden Web sites in the United States. These findings could be helpful to public gardens wishing to create Web sites or make improvements to their current Web sites.

The first step in this research was to review current literature about Web site design and development. Museum, zoo, and for-profit Web sites were examined for both design and content issues which could then be applied to public garden Web sites. This step provided many ideas for potential content types which could be applied to public gardens. Important aspects of Web design dealing with navigation, content, speed of download, and site hierarchy are discussed in Chapter 2.

An institutional survey was prepared to look at the development, maintenance, content, and analysis procedures currently in place for public garden Web sites. The surveys were distributed to American Association of Botanical Gardens and Arboreta (AABGA) institutional members who charge admission and have Web sites. The criterion of having an admission charge was created in order to eliminate institutions such as university gardens that have a different focus or audience than a public garden. An Internet search was completed to determine this information. One hundred sixty-one surveys were mailed with a cover letter to institutions matching the criteria. A copy of the survey and cover letter can be found in Appendices A and B (pp. 76-85). A total of 68 completed surveys were returned, representing a 42% return rate. The sampling error based upon sample size and return rate for this survey was 3.8% (Babbie, 2001, p. 192). The data were entered and analyzed using SPSS software. Questions with write-in responses were coded according to the types of answers received and grouped into multiple categories.

The results of the survey provide a general picture of how admissions charging public gardens are currently using Web sites. The reader should realize the results of the survey are limited to the institutions that chose to respond to the survey; a higher return rate would have decreased the sampling error. Also, with a medium such as the Internet, it is not always the commonalities which are the most interesting. Rather, the new and innovative ideas which a small percentage of respondents are using make their Web sites more unique and inspiring.

Chapter 2

RESULTS OF LITERATURE AND WEB RESEARCH

Web Site Design Features for Public Garden Web Sites

There are many considerations for proper Web site design. The background research on current literature and Web sites revealed several prevailing qualities. Design features include visual consistency, text, amounts of 'white' space, download speed, home and subsidiary page design, overall site hierarchy, navigation and use of colors, sound, and animation. Many of these features are interdependent and thus, should be planned in advance in order to create a visually-pleasing design.

General Design Considerations

There are many design elements to consider in a Web site. Consistency is created in a Web site by using repetition of colors, logo, and layout. A unified appearance will signify to the user that he is still in the same site as he moves deeper into the site's hierarchy. Navigation schemes should also remain similar in appearance. The use of consistent layouts will make site design faster, as information from one page will be similar to that of the next (Bradley, 2001, p. 7).

The text, as the main information providing portion of the Web site, should be easy to read. The designer should consider the font type, size, and color when

formatting text for the Web. "Use colors with high contrast between the text and the background. Optimal legibility requires black text on a white background (Nielson, 2000, p. 9). Other color schemes can be used, but care should be taken to maintain adequate levels of contrast. The background of the Web site should be of a subtle color or texture to not interfere with the text and graphics. Use font sizes which are easy to read and avoid use of blinking text as well as writing in all capital letters (Nielson, 2000, p. 126). Color is an important consideration for text. Some colors may make it difficult for users to read the site's information. Red and green, for example, are problematic colors for those with red-green color blindness. Blue is difficult for people to see as they grow older.

The font's typeface is a consideration as well. The main types of fonts are categorized as serif or sans serif. Serif fonts include Times New Roman and Courier. Sans serif fonts include Arial and Helvetica. All major browsers are able to read these fonts. Sans serif fonts tend to be easier to read than serif fonts so a designer may wish to utilize Arial or Helvetica for the majority of written content. If a designer wishes to use a different font and have it remain constant in all Web browsers, it is best to create the information as a "low-resolution graphic that can be handled by all browsers" (Dodd, 2001, p. 11).

The way the text is laid out is also an important consideration. Left-justified text is easier to read because "the user can read much faster than when faced with centered or right-justified text" (Nielson, 2000, p. 126). The use of bullets and lists within text can also improve readability.

Each page of a Web site should also have adequate “white” space. This means that there should be an eye-pleasing balance created between text, graphics and background. “‘White’ space can guide the eye and help users understand the grouping of information” (Nielson, 2000, p. 18). Text-heavy pages are easier to read if blank lines are left between paragraphs, creating a visual separation (Bradley, 2001, p. 8). Using too much text or graphics on any one page could overwhelm the eye and confuse the user.

The speed of download should also be considered when designing a Web site. Graphics should be created to load quickly.

“On the Web, 4 seconds can be a lifetime. Not long ago, the accepted wisdom was that the average user would abandon a Web page if it didn’t load within 8 seconds, even if in the middle of a transaction. Now, that figure has been cut in half, according to a recent study...” (Metz, 2001, p. 165)

Large amounts of text should not be created as a graphic because they take too long to download. Text will load first on a Web page, so a user will be able to read the content while waiting for elements requiring more time to appear on her screen. The type of connection the user has and amount of traffic on the server will affect the speed of download. “For top performance for the widest possible audience, limiting Web pages to between 35K and 60K is best” (Metz, 2001, p. 165). Images saved as a Graphics Interface Format (GIF) or Joint Photographers Experts Group (JPEG) files are best for use on the Internet. Saving files as JPEG or GIF compresses the size of the image file.

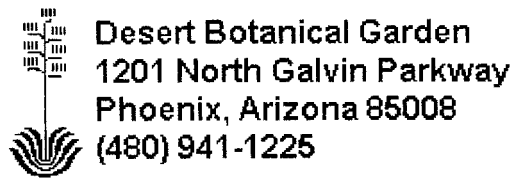
“GIF works best with images that use fewer, yet distinctive, colors, such as buttons, icons, and straight-edge images (cartoons and line-art), and textual images that have blurred edges. JPEG works best with color or black and white photographs where there are a lot of smooth color changes. While black and white photographs work well with JPEG, straight black and white images

don't unless there are at least 16 shades of gray" (Flanders and Willis, 1996, pp. 74,76). Portable Network Graphics (PNG) files are a new form of graphical formats which produces images that do not lose quality during compression. PNG also supports more colors, but may not be supported by all browsers (Savetz, 2001).

Index Page Design

The index page, also commonly referred to as the Home Page, is usually the first page one comes to when entering a Web site. This page should have a design and layout that distinguishes it from other sites on the World Wide Web. However, it should also conform to some standards which users will find helpful in understanding each particular site. A listing and brief description of these features follows.

One of the first items needed for a Web site is a method of identification. This can best be accomplished by placing the garden's logo and name at the top left corner (Fig. 1, p. 9). "When a browser displays a Web page, it starts at the top left of the window and works its way down" (Flanders and Willis, 1996, p. 101). Because of differing screen sizes and monitor resolutions, users will be able to determine which site they are on quickly if Web sites have this common feature. As some devices do not show graphics, there should also be a short description of the site, so a user can understand where they are. This will help users who have arrived at the site from a search engine or link from another Web site. Graphics should also be used for Web sites such as public gardens in order to show the user what the Web site is about.



**Figure 1: Logo found on Top Left Corner of Web Site
(Desert Botanical Garden at <http://www.dbg.org>)**

The index page is typically the space which serves as a table of contents for the entire Web site, therefore menu items should be available to link viewers with the Web site's information. Ten or less menu items are desirable to avoid overwhelming the user (Rosenfeld and Morville, 1998, p. 38). Menu items are sometimes represented by different icons. This should be done with care to assure the user will understand the metaphor used. For example, it makes sense to have an image of food for information about the garden's café, but it could be confusing to users to represent all menu items with the same image (Fig. 2, p. 10). Icons should also include textual descriptions so they can be understood by everyone (Bradley, 2001, p. 8). Some of the common categories listed for public garden Web sites include; visitation information (hours, admission, maps, facility rentals, reservations, and tours), plant information (gardens, collections, bloom calendar, research), garden events, involvement information (membership, volunteer, employment, and donor information), education (classes and school groups), history, and guest amenities (gift shop and food service). Some sites also include press, tourist (hotels and other nearby destinations), and child-centered information, as well as other items which are particular to the garden.



Figure 2: Examples of Web Site Menu Icons
 (Found on Chicago Botanical Garden Web Site at <http://www.chicagobotanic.org>)

In creating the index page, public garden Web designers should consider the amount of space used. In general, an index page should not be longer than two or three screen lengths. Many users will not scroll vertically, so the more a Web site is limited to the top several inches of a page (480 pixels) the more likely a user will actually see the information. The design of the page should not classify the width of the screen size or classify 580 pixels. According to Jakob Nielson, not classifying a width in tables or frames allows it to be dictated by the user's viewing device of the user, be it 19-inch computer monitor or a handheld device, such as a PDA. If 580 pixels is the page width, it will fit most monitors and decrease the possibility of the user scrolling horizontally (Garrison, 2002).

Subsidiary Page Design

The subsidiary pages of a Web site are those found under the index page. These pages should be grouped according to content, have a design similar to the index page, include the name of the overall site, and have consistent navigation tools. There should be a link back to the index page from every page within the site (Bradley, 2001, p. 7). This is particularly important because a user could arrive at a subsidiary page in the site through a link or a search engine and be unable to further explore the site if there is not a method for the user to move to the higher pages.

Many Web sites achieve this by having a menu bar at either the top or left side of each subsidiary page with a link to “home” or the site’s logo which when clicked will take the user back to the index page.

On-line text should not be written like text in a book. Begin each page with the conclusion so the user will quickly know if they have found the information they want. Use bulleted lists, short paragraphs, nested headlines, and highlighting to emphasize importance will allow the user to quickly scan information (Nielson, 2000, pp. 104-106, 111). Nested headlines show at a quick glance what the following paragraphs of text discuss. Using this technique allows the user to find information quickly without excess reading.

Summary

If the specifics of design, content, and navigation are addressed at the beginning of the creation process, it is more likely that the Web site will be successful at communicating the desired information to the target audience. The described items are the basics for creating a Web site. There are many possibilities which are only limited by imagination, current technology, and an institution’s resources of time and money.

Chapter 3

RESULTS AND INTERPRETATION OF SURVEY

A survey was used to determine the current use of Web sites by public gardens. The survey was divided into sections including; institutional information, Web site development, Web site maintenance, Web site content, and Web site analysis and testing. The survey was distributed to 161 American Association of Botanical Gardens and Arboreta members in the United States that have Web sites and charge an admissions fee. Sixty-eight surveys were returned. The results of the survey follow in this chapter.

Demographic Results

Budgets

The annual operating budgets of the institutions show that the respondents are distributed across the varying budget categories (Fig. 3) (p. 15). The smallest portion, three percent, indicated they were in the under \$200,000 annual budget category. An additional 19% indicated annual budgets between \$200,001 and \$500,000. According to the 2001 AABGA's Membership Directory and Handbook, the majority of member institutions fall into the category of under \$500,000 per year (69.8%). Some reasons why there may be such a difference between the sample of respondents

and the overall membership of AABGA are found in the sample used for this survey. Requiring both a Web site and admission fee meant that a majority of the gardens and arboreta with small budgets were not included because they did not fit the criteria. The percentage of gardens classified by AABGA as having a small annual budget included in this survey was 43% of the surveys mailed. The amount accounted for in the respondents was 19%. An explanation for the small amount of response in this group may be from a lack of time to complete the survey because the limited number of staff.

The amount of respondents in the medium sized budget category (\$500,001-\$2 million) according to AABGA was 33%. The percentage of respondents in the large sized budget category (over \$2 million) was 41%. Some of the respondents did not specify their budget amount or noted it was confidential information. This group amounted to 7% of the total respondents.

Staff Size

Staff size at the institutions also varied greatly (Fig. 4) (p. 16). Included in the count of employees were full time, part time, and interns. Institutions with over 200 employees accounted for 10.5% of the cases. There were no cases with between 101 and 200 employees. Institutions with between 51 and 100 employees represent 22.4% of the cases. Thirty-one and three tenths percent of the institutions had between 21 and 50 employees. Sixteen and four tenths percent of the institutions had between 11 and 20 employees. Nineteen and four tenths of the cases had ten or fewer employees with 7.5% having fewer than 5 employees.

When one compares these two data sets, some trends are seen (Fig. 5) (p. 17). Institutions with five or less employees had budgets under \$500,000. Organizations employing between six and ten people fall into the medium sized budget category (annual budget between \$200,001 and \$1,000,000). Over half of the gardens with budgets between two million and four million dollars had between 21 to 50 employees, while the rest of this group had between 201 and 300 employees. All institutions with over four million dollar annual budgets had over 50 staff members.

Summary

Various annual budgets and staff sizes were reported by the surveyed institutions. Most of the responding institutions have annual budgets over \$200,000. Over half of the institutions had between 21 and 100 employees. With the varying staff and budget sizes represented, public gardens that were not part of this study should be able to compare themselves to some of the institutions that were part of the survey.

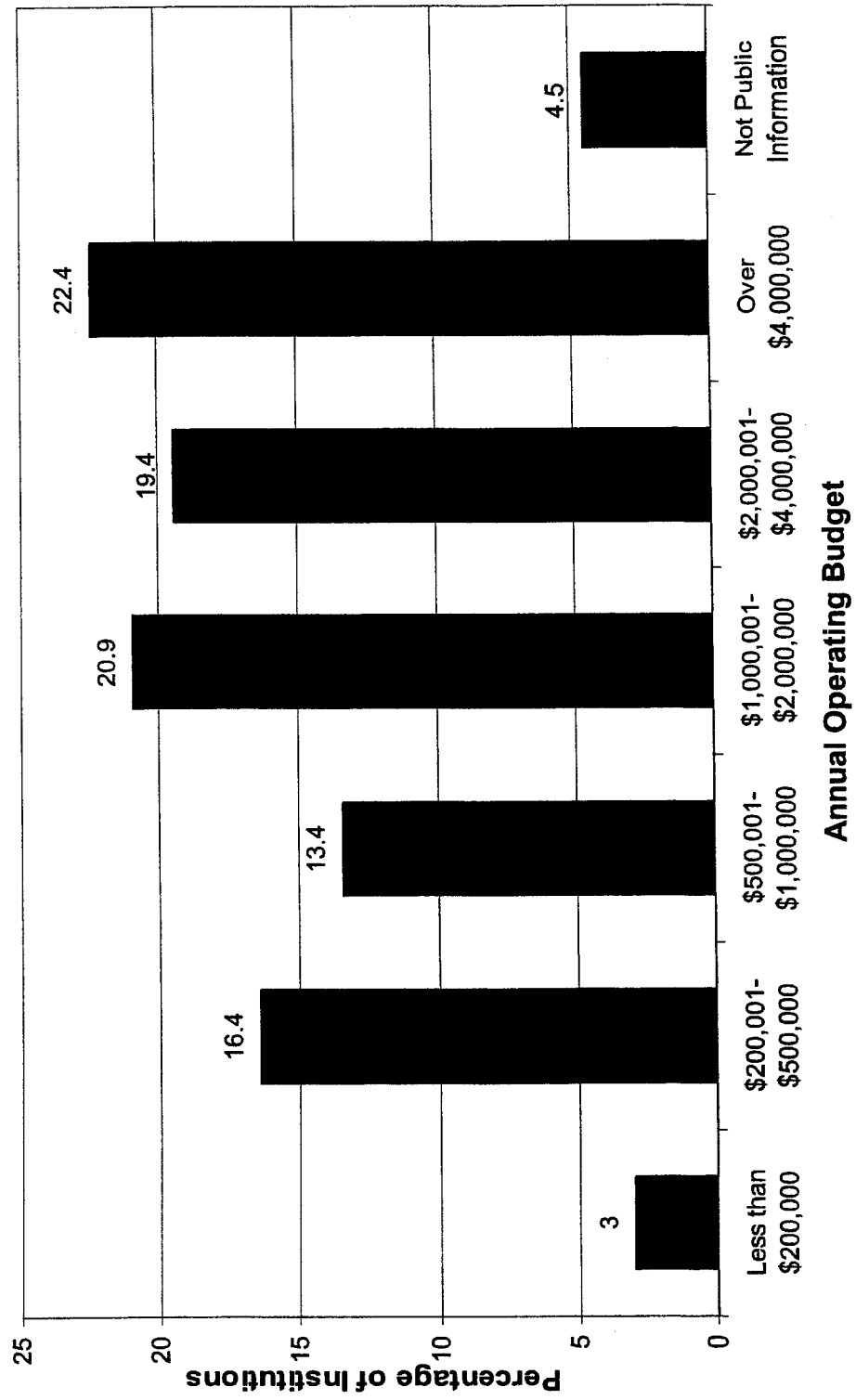


Figure 3: Annual Operating Budgets of Responding Institutions

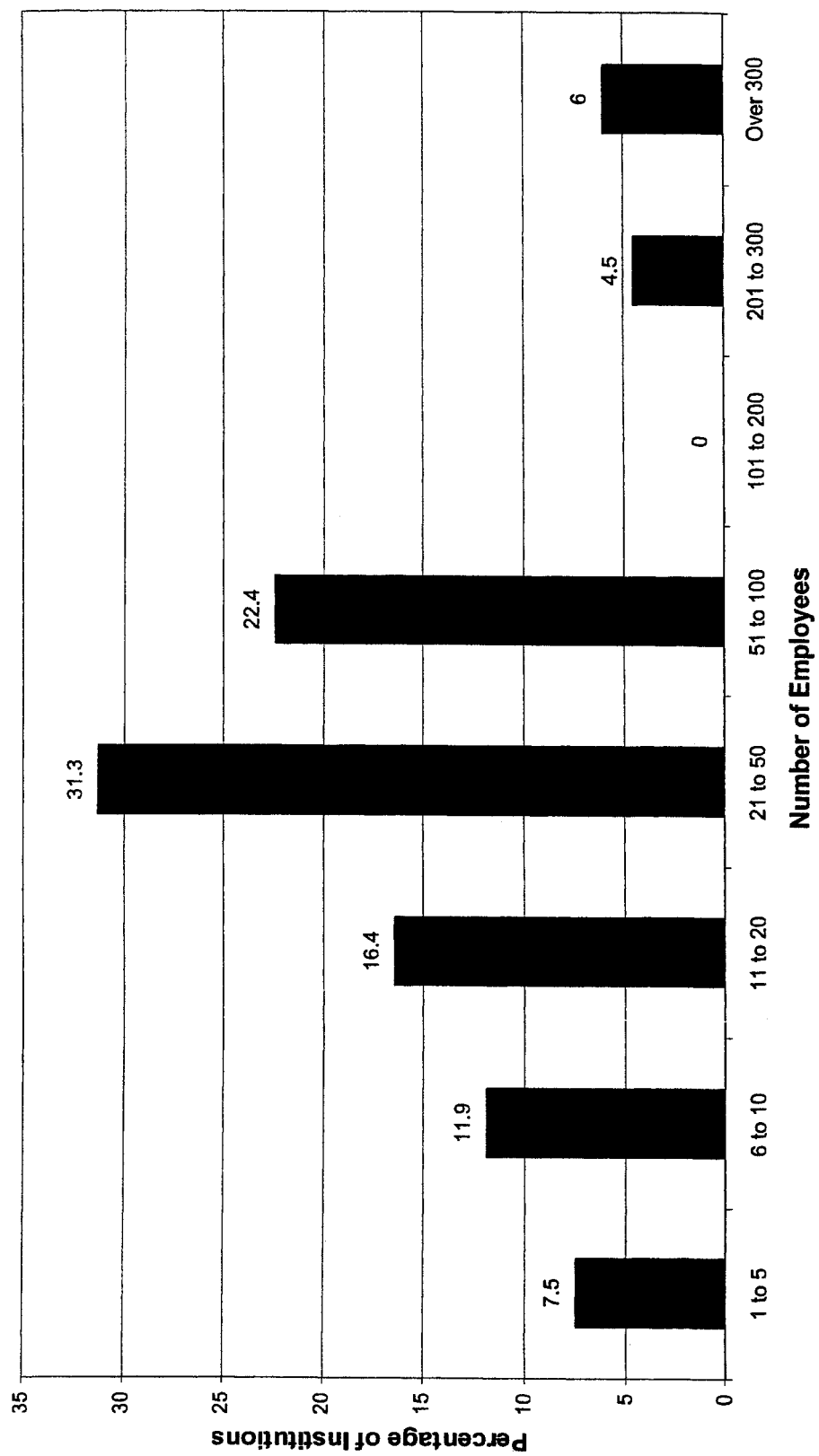


Figure 4: Institutional Staff Size of Responding Institutions

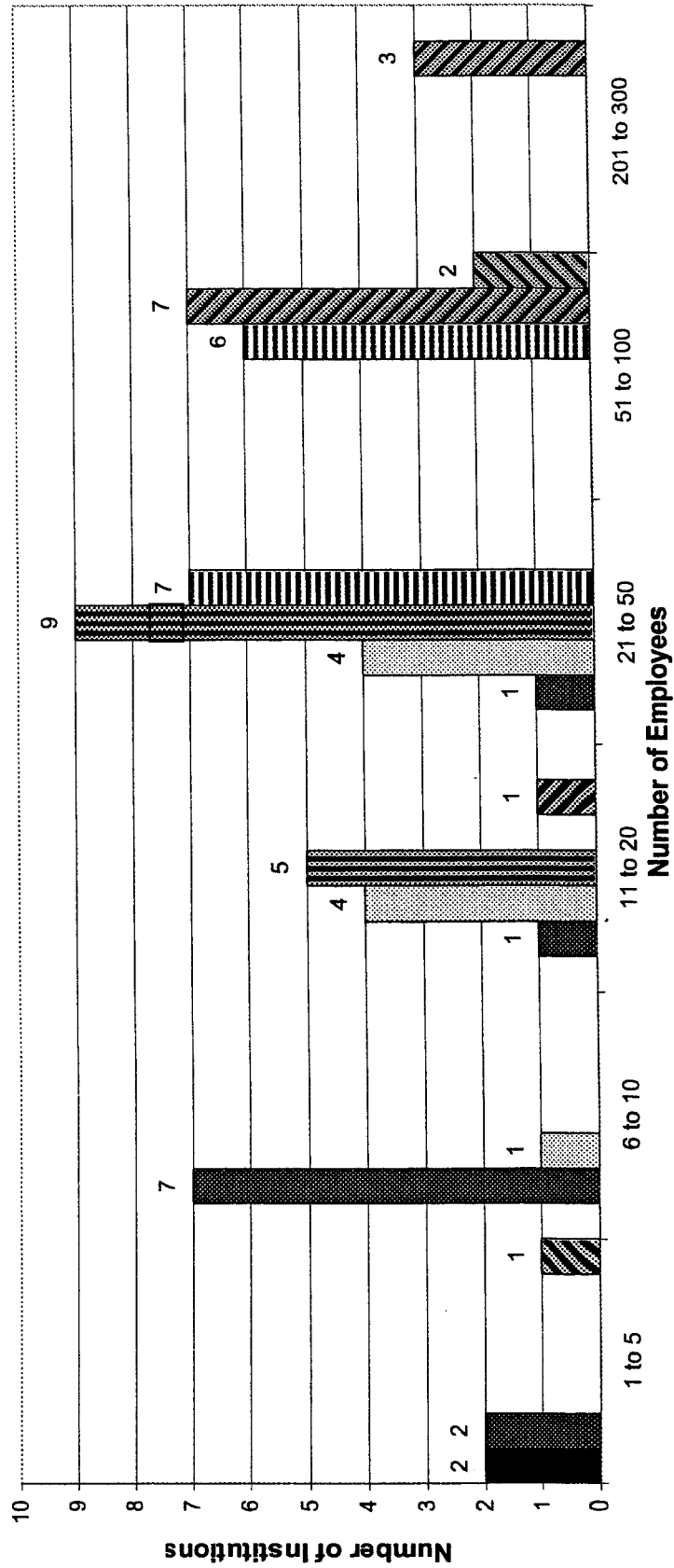
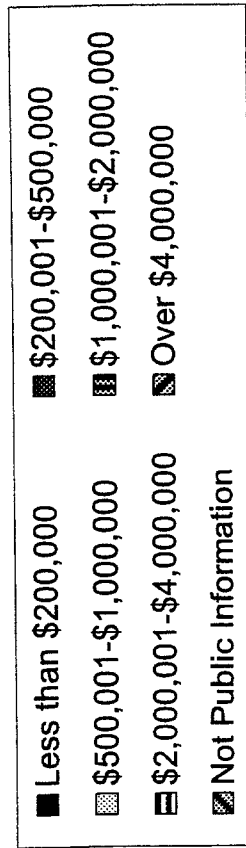


Figure 5: Annual Operating Budget (\$) vs. Staff Size

Web Site Development

Purposes and Goals

At the foundation of a good Web site is a clear sense of purpose. A good site shows evidence the designer understands why the site was created in the first place. The design is appropriate for its intended audience and meets its needs by providing the desired content. This stated purpose will become the key direction for your site. In the future, if you're unsure whether to include something on your site – such as a notice about selling your house – check the site's purpose. If your intended content is not in accordance with the site's purpose, don't include it (Bradley, 2001, p. 7).

Numerous purposes were stated for institution's having a Web site. The following reasons are those receiving the highest percentage of responses (Fig. 6) (p. 28); distribute visitor information (98.5%), inform the public about institution's programs (92.6%), increase institution's on-site visitation (88.2%), attract new audiences (83.8%), inform the public about institution's mission (80.9%), inform public about institution's history (79.4%), and increase number of members (72.1%). Other purposes which were identified are as follows (Fig. 7) (p. 29); advertising or selling merchandise (4.4%), provide on-line horticulture information (4.4%), provide access to collection's information (2.9%), provide classroom instruction (1.5%), provide directions to institution (1.5%), and distribute research (1.5%). These reasons related to the goals that the institutions had for their Web sites.

The most common goal noted for Web sites was to disseminate information (57.4%) (Fig. 8) (p. 30). Other goals noted included; create awareness (41.2%), advertise programming (26.5%), education and community outreach (22.1%), and increase visitation (23.5%). Several institutions noted having goals that were the same as their purposes (20.6%).

Target Audience

When one considers the goals and purposes of an item such as a Web site, the target audience should also be determined. The target audience should also dictate the topics included on the site and the depth of the topic's coverage, as well as the level of technology (Bradley, 2001, p. 7). A site focused on disseminating research information should have portions of higher technical expertise than a site with a target audience focused toward children. On the World Wide Web it is possible to create a Web site that can serve several audiences. It can inform members of upcoming events and activities while enticing someone who has never visited the institution to plan a visit; disseminate research information to scientists while also advertising the use of facilities for weddings.

The respondents reported the following as their Web site target audience (Fig. 9) (p. 31); tourists (47.7%), garden enthusiasts (29.2%), general public (23.1%), members or friends (23.1%), educators or students (21.5%), and first time visitors (15.4%). Other groups noted at lesser frequencies were: education program customers, facility rental customers, families, people with an interest in the institution, the local community, professionals and horticulturists, return visitors, and people with varied interests which tied into the institution's mission, such as nature or wildlife.

Content Responsibility

The role of creating content for the institution's Web site involved many different job positions (Fig. 10) (p. 32). In 55.9% of the cases the director was

involved. The second highest involvement area was found within the marketing department with 48.5% involvement. Other types of staff involvement included; the educational staff (35.3%), horticultural staff (32.4%), and administrative assistant (17.6%). Non-staff involvement in the creation of content for the Web site included Web consultants (27.9%), design consultants (22.1%), and volunteers (17.6%). Other positions which were noted as having responsibilities in creating content were found within the technology staff (14.7%), interns (5.9%), research division (4.4%), staff graphic designers (1.5%), and college students (1.5%). While the positions noted earlier have the highest rate of participation in Web content creation, it is the latter which show that it is possible to involve staff members in the process who may have special interests or talents in Web design. Content may come from people with many different areas of expertise, be it horticulture or public relations. Having a combination of several different positions working together should increase the range and type of content available on the Web site.

When one considers the likelihood of a director's involvement in the creation of content for their institution's Web site, the institution's staff size can be examined. In 84.6% of institutions with fifty or less employees, the director was at least partially responsible for the creation of content for the Web site (Fig. 11) (p. 33). Of institutions with more than 50 employees had directors involved with content in only 31.8% of the cases.

Design Responsibility

The responsibility for designing a Web site, that is taking the developed content and putting it on-line, was also distributed across several job descriptions (Fig. 12) (p. 34). In the case of design, it is more likely for an institution to pay an outside consultant for their skills and expertise. Many institutions have more than one position which contributes to the design of the Web site. Web consultants were used in 32.4% of the institutions and design consultants in 29.4% of the cases. Staff from within the marketing department designed 29.4% of the Web sites. The director was immediately involved in one quarter of the cases.

Much like the creation of content, it is possible for staff members of varying job titles to have expertise or an interest in learning Web design and can therefore be responsible for the Web site design. If an institution is able to cultivate these talents from the inside rather than pay for consultants, it may be able to have a Web site that better reflects the mission of the institution. Institutions of varying sizes had similar reliance on outside expertise through the use of Web or design consultants.

Institutions with ten or less employees had outside consultants involved in 30.8% of those cases (Fig. 13) (p. 35). Institutions with between 11 and 20 employees had outside consultants involved in 36.4% of those cases and institutions with between 21 and 50 employees had consultants in 38.1% of those cases. Likewise, directors were less involved in the design of the Web sites overall (Fig. 14) (p. 36). The director was more involved with the design in those institutions with ten or fewer employees (38.5%) and less involved in institutions with more than 10 employees: 11 to 20

employees (16%), 21 to 50 employees (28.6%), 51 to 100 employees (20%), 201 to 300 employees (33.3%), and over 300 (0%).

Internet Service Providers

An Internet Service Provider (ISP) is a company that provides access to the Internet. This company has a Web server which is permanently connected to the Internet and allows others connected to the Internet to transfer files to their own machine, either to update their Web site or to view another Web site. An ISP provides companies with a direct connection from the company's networks to the Internet. A company can also be their own Internet Service Provider. Some considerations in hosting your own ISP include having a permanent connection to the Internet, protection from power outages, system crashes, and security from hackers (Niederst, 2001, p. 33-34). Because of these necessities, only large organizations will generally serve as their own ISP.

The majority of Web sites are out-sourced to an ISP for a monthly fee. The cost for hosting a Web site is dependent upon the size of the site, but a basic Web site should cost approximately fifty dollars a month. Depending on the types of additional services, amount of disk space needed, and amount of traffic the Web site receives, the Web site will have additional costs. There are many ISP companies from which to choose, and the organization should consider what its ideal Web site would be and what services they will need when they select an Internet Service Provider. (www.webdevelopersjournal.com/columns/abc_hosting.html)

Twenty-one percent of the respondents serve as their own Internet Service Provider. Seventy-nine percent of the institutions out-source their Web site to a provider (Fig. 15) (p. 37). Half of the institutions which currently serve as their own ISP have had an Internet presence for five or more years (19.1%) (Fig. 16) (p. 38). These institutions are larger in size and many are connected with a larger institution, such as a college or university which has its own server.

Years of Web Site Availability

The length of time an institution has had a presence on the Internet is important to consider. The Internet is still a relatively new medium for many of the respondents, although there are a large number of institutions that have been online for some time. Only one institution reported being online for less than one year (1.5%). Institutions have been online for a year or more as follows: 8.8% have been online for one year, 25% have been online for two years, 17.6% have been online for three years, 17.6% have been online for four years, and 29.4% have been online for five or more years (Fig. 17) (p. 39). Many of the institutions that have been online for several years have reported they have or will soon be revising their sites.

Length of Planning and Development

The planning and development of a Web site is an important phase which includes determining the audience and goals of the site, finding an Internet Service Provider, and developing the content and design for the site. Respondents spent the following amounts of time in the planning and development stage; under one month

(10.8%), between one to three months (16.9%), between four to six months (32.3%), between seven to twelve months (26.2%), between 13 and 18 months (7.7%), between 19 and 24 months (1.5%), and over 24 months (4.6%) (Fig. 18) (p. 40). The length of time in planning and development only takes into account for the longevity of time, and does not represent the amount of staff hours spent writing content, developing graphics, or determining the site's layout. The process can be done rather quickly for Web sites which do not have large numbers of pages or the process can take a longer time if the institution has not made it a high priority or if the site is to be large in scope and features. The four to six month period of time for planning and development would seem to be a fitting timeline for an organization wishing to create a high quality presence on the Internet.

Costs to Build Web Site

The costs associated with building a Web site can be separated into different entities, time and money. The financial side of creating an Internet presence includes setup costs associated with an ISP, hiring outside design and Web consultants, and other work which an institution may not be able to do in-house. Higher expenses will generally be seen by a Web site which is built utilizing outside expertise. In order to reduce this amount, an institution should be well prepared with an ideal site layout, written content, and chosen graphics prepared before bringing in an outside professional

(http://hotwired.lycos.com/webmonkey/99/22/index4a_page6.html?tw=e-business).

One also should consider the types of content which will be available on a site. For example, a site which has e-commerce capabilities or interactive games will be much more expensive to create than a site without items requiring technical coding.

Public gardens tended to have inexpensively built Web sites (Fig. 19) (p. 41). Thirty-eight and two tenths percent of the responding institutions paid less than \$500 to build their Web site and 14.7% paid between \$500 and \$1000. Ten and three tenths percent spent between \$1001 and \$2000. Another 14.7% of respondents spent between \$2001 and \$5000 and between \$5001 and \$10,000. A total of 5.9% of the responding institutions spent over \$15,000, with 4.4% of the cases spending over \$25,000. Sites in the highest cost categories had Flash introductions, animated images, sound bytes, pop-up and rollover menus, on-line message boards, site maps, and plant databases. The designs were professional-looking and easy to navigate.

If the cost of the Web site is compared to the length of planning and development some major trends can be observed (Fig. 20) (p. 42). For example, Web sites planned and developed in under one month (9.7%) and between one and three months (9.7%) were likely to cost the institution under \$500. The largest range of cost compared to time can be observed in the four to six month range of planning and development. For this amount of time, costs ranged from under \$500 (8.1%) to over \$25,000 (1.6%). In the 7 to 12 month time period, the range in cost was from under \$500 to \$10,000. The categories representing periods over thirteen months show little congruity as there are few responses in these categories. It could be surmised that institutions in these categories with long time periods and low costs were unable to commit constant time to the Web site development process during a short span of

time so the length of planning and development was allowed to stretch for several months longer than may have been necessary.

Staff Time to Build Web Site

The second category to consider in costs is the amount of staff time involved in creating the Web site. This was separated from the monetary costs in order to determine what types of staff commitment may be needed from an institution wishing to create a Web site. Again, a majority of the institutions were grouped in the lowest two time categories with 27.9% spending less than 50 hours, and 19.1% spending between 51 and 100 hours to build the Web site (Fig. 21) (p. 43). Another 26.5% of the institutions spent between 101 and 300 hours, 7.4% spent between 301 and 500 hours, 5.9% spent between 501 and 700 hours, 1.5% spent between 701 and 1000 hours, and 2.9% spent over 1000 hours to build their Web sites. Eight and eight tenths percent of institutions responded that this was unknown due to the amount of time passing since the Web site was first developed.

Comparisons of the two types of costs show that a majority of institutions spent less than 50 hours and \$500 to create their Web site (28.3%) (Fig. 22) (p. 44). This seems to correlate when one considers a balance between time and money resources. Time spent by the institution is likely to be low if the monetary inputs are low. An institution that spends between 51 and 100 hours expends in most cases under \$2000. Institutions spending higher amounts used consultants rather than staff to create their Web sites. Institutions spending between 101 and 300 hours were likely to spend between \$500 and \$10,000. There are a few cases in which the

institution spent between 51 and 300 staff hours, yet paid over \$5000 for their Web site to be built. In these cases it is likely outside consultants were used to do much of the work which other institutions were able to do in-house.

The length of planning and development also correlates well to the institutional staff time in building the Web site (Fig. 23) (p. 45). Institutions that spent less than 50 hours of staff time generally spent under 12 months in planning and development (27.3%). Institutions that spent between 51 and 100 hours were most likely to spend between four and six months in the planning and development process (8.1%), but no more than 13 to 18 months. For institutions that spent 101 to 300 hours building the Web site, it was likely to spend between 4 and 12 months in the planning stage (24.2%).

Summary

It is important for public garden's to outline goals and have a target audience in mind when developing their Web site. The development of Web site content may be best done by a staff member or someone who is familiar with the garden. Web site design, however, may be much quicker for an expert to create than a novice. Most public gardens answering this survey have had a Web site for over two years. Public gardens generally spent under a year in the planning and development process and the costs to build the Web site were under \$2000 for a majority of the respondents, with higher cost sites having features which require more design knowledge. The amount of staff time involved in creating a Web site was also relatively low, with a majority using 300 or less hours of staff time.

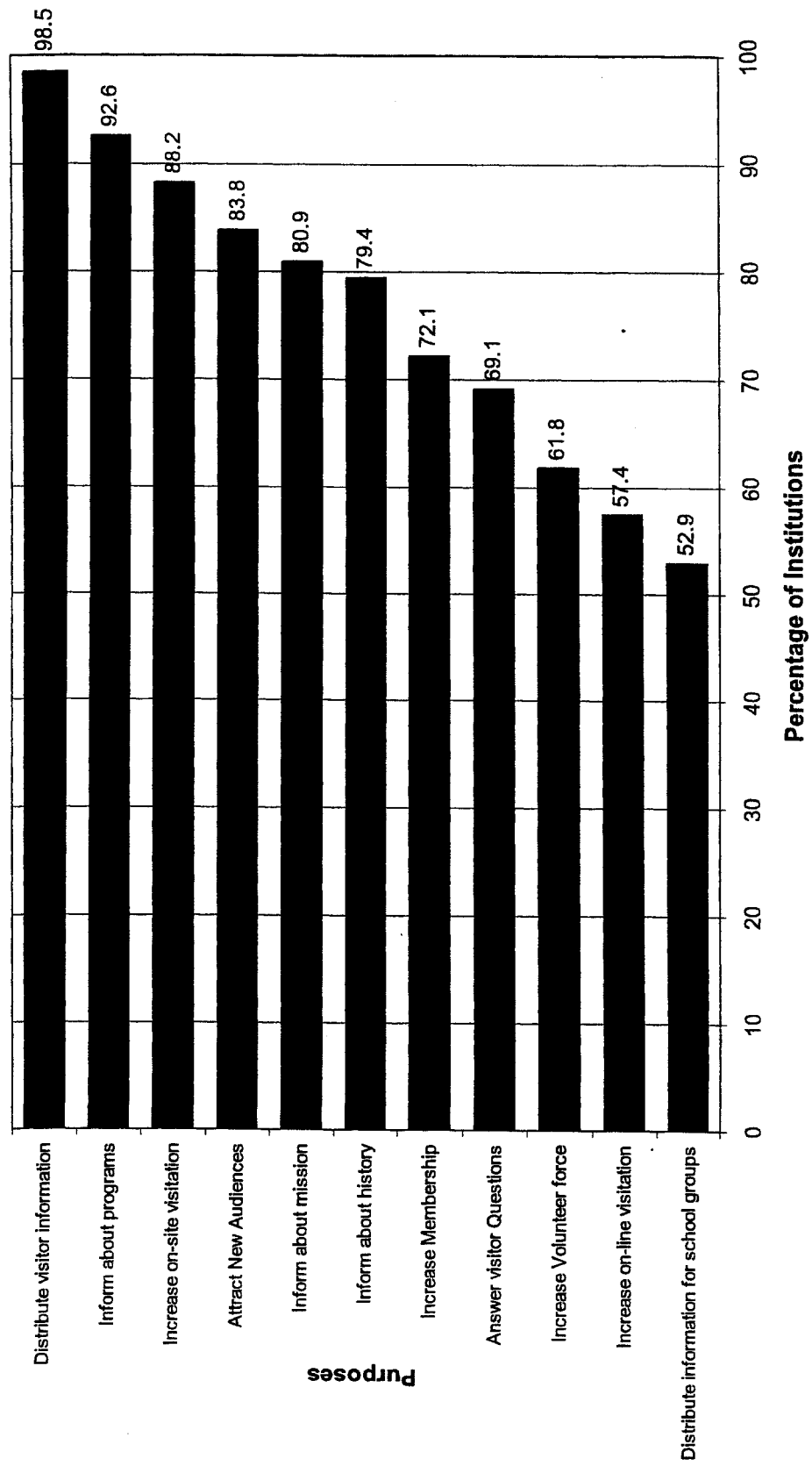


Figure 6: Purposes of Web Sites

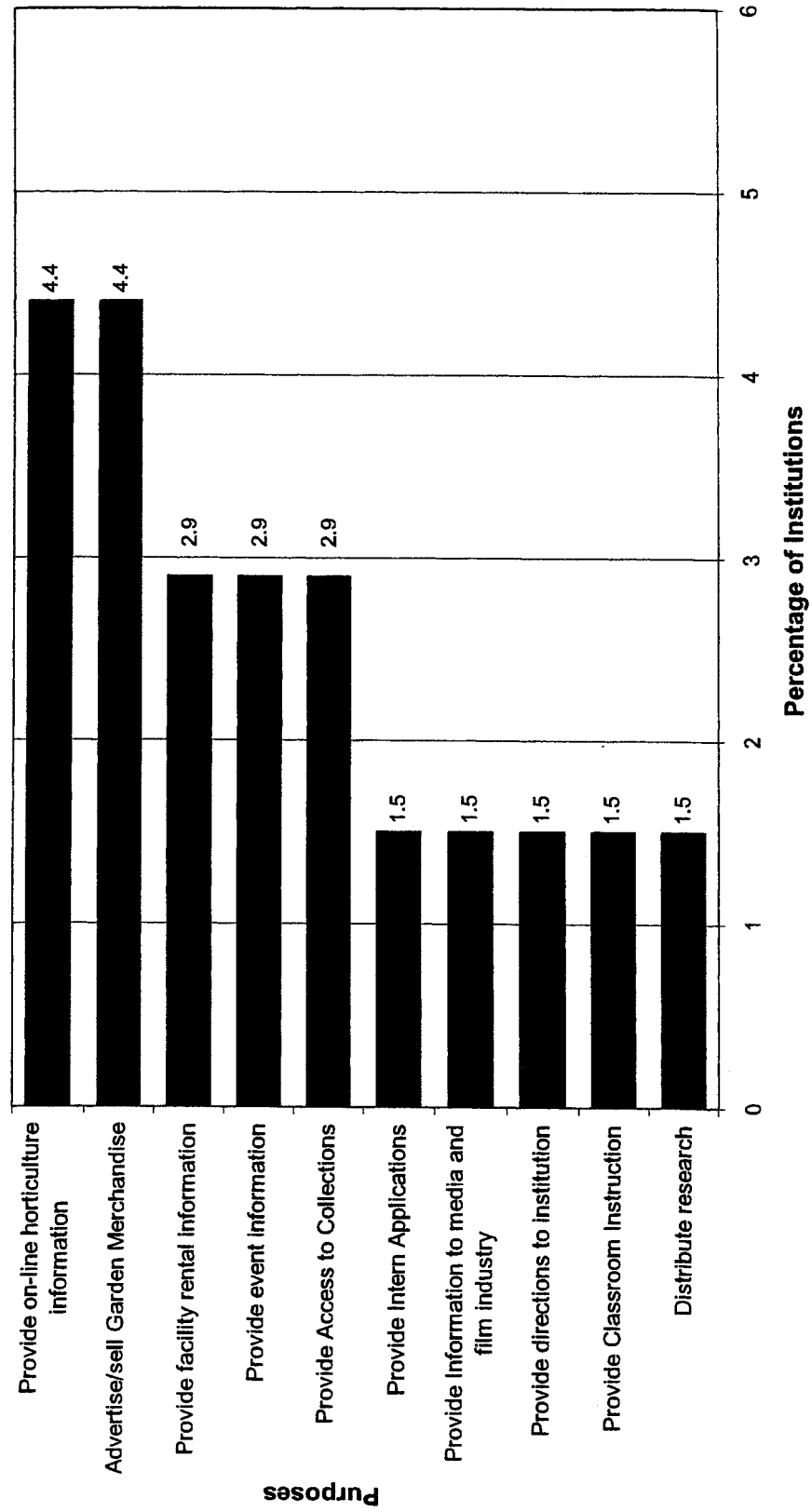


Figure 7: Low Ranking Purposes of Web Sites

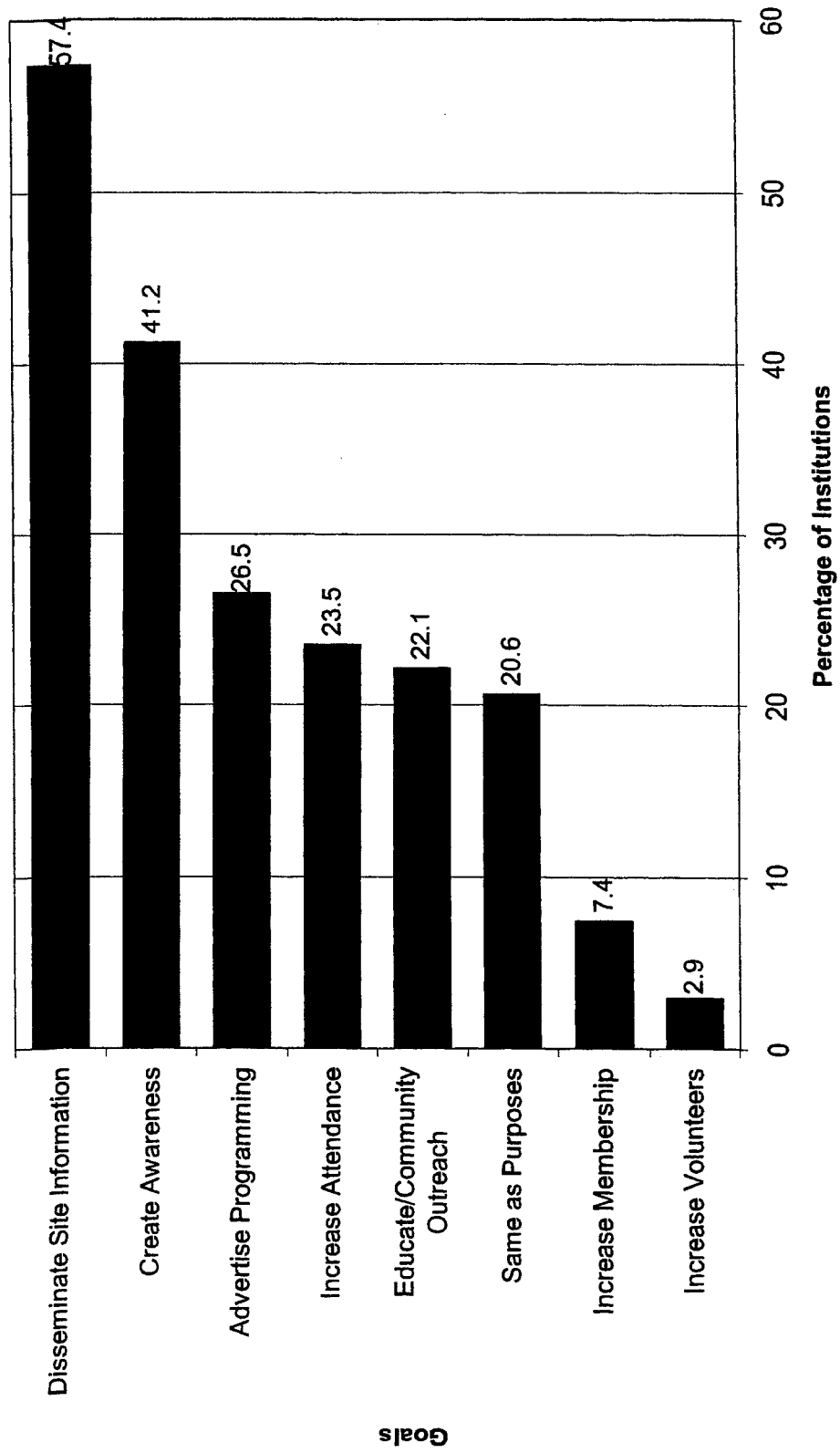


Figure 8: Goals of Web Sites

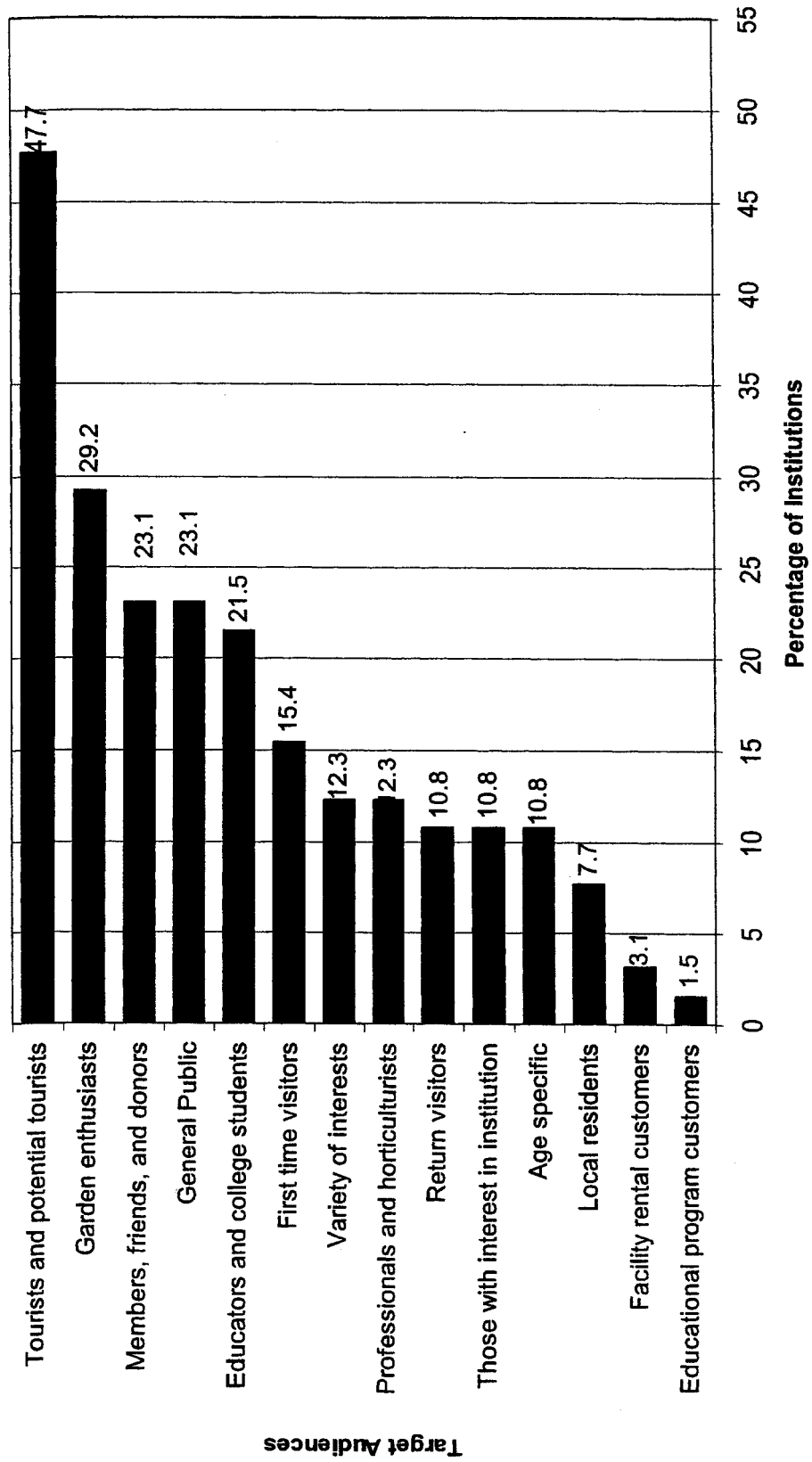


Figure 9: Target Audiences for Public Garden Web Sites

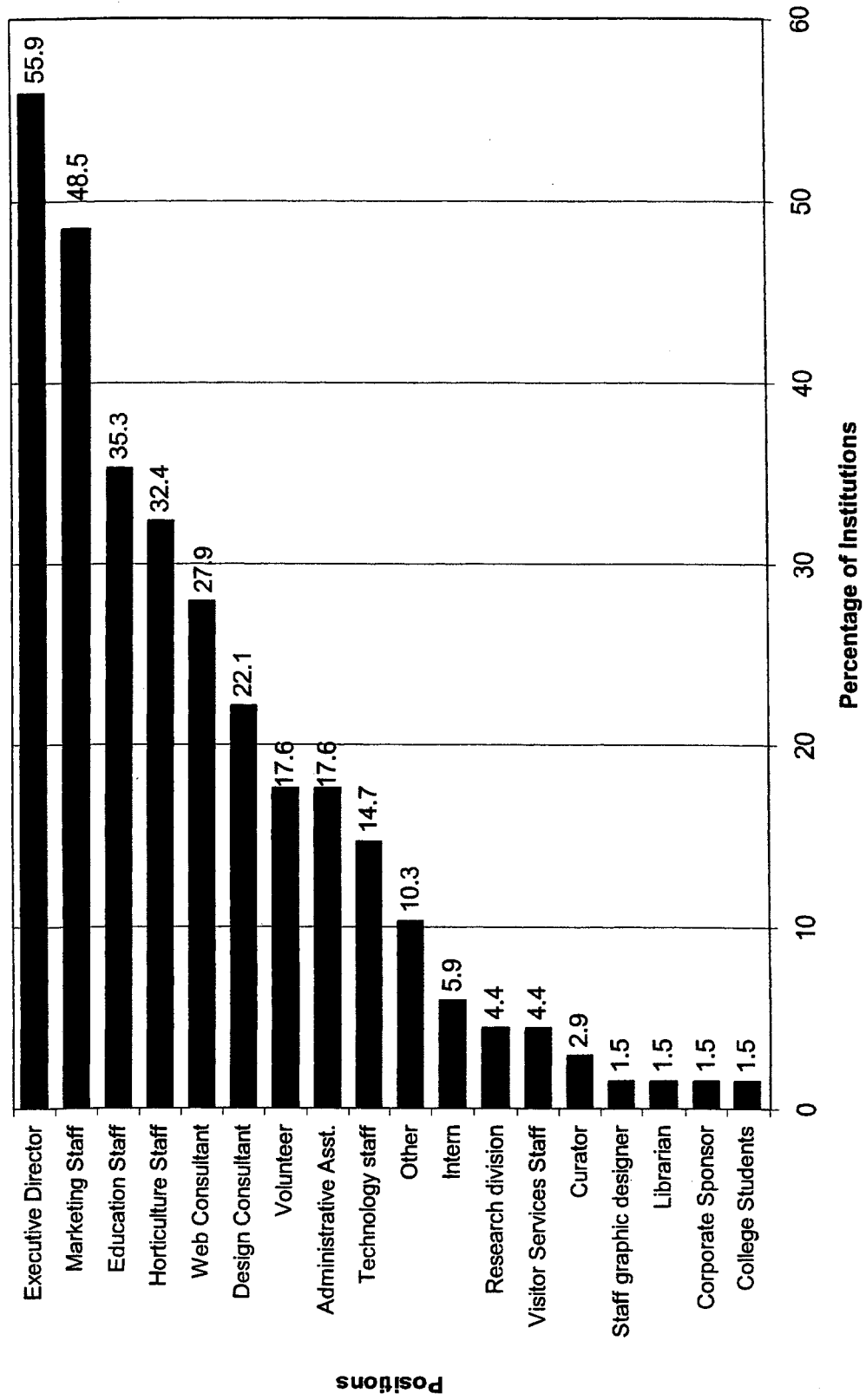


Figure 10: Content Creation Responsibility

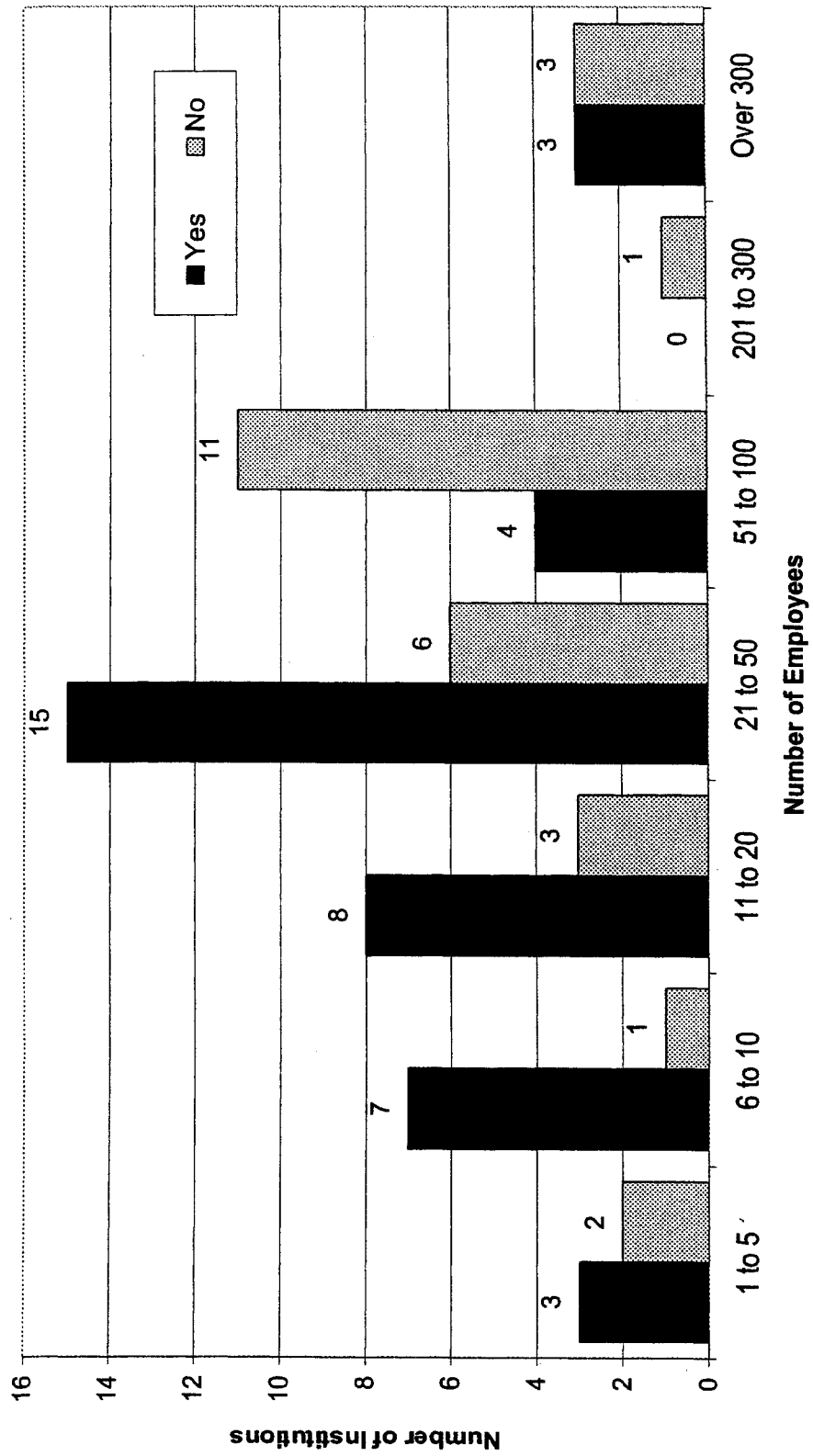


Figure 11: Directors Responsible for Portion of Content

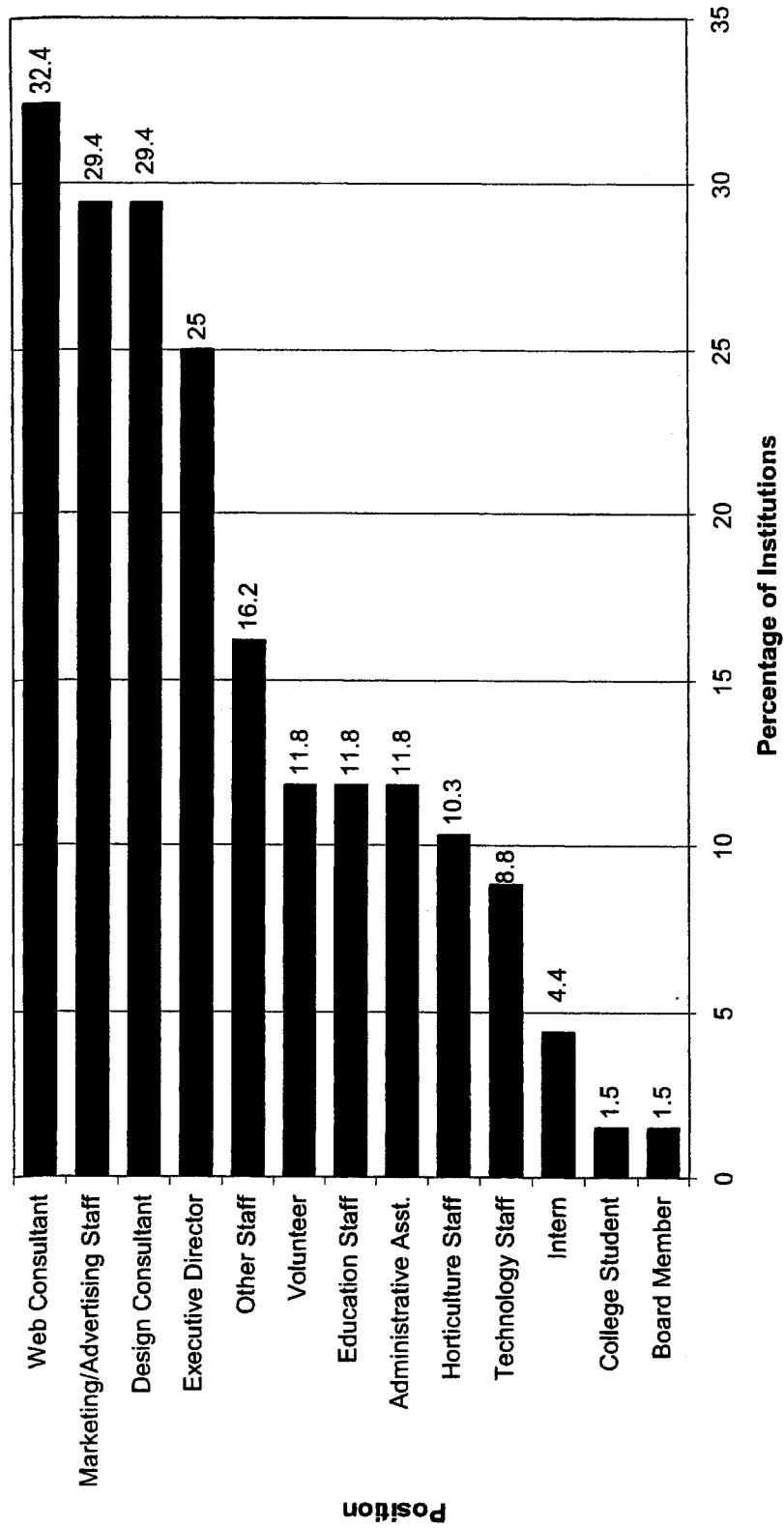


Figure 12: Positions with Web Design Responsibility at Public Gardens

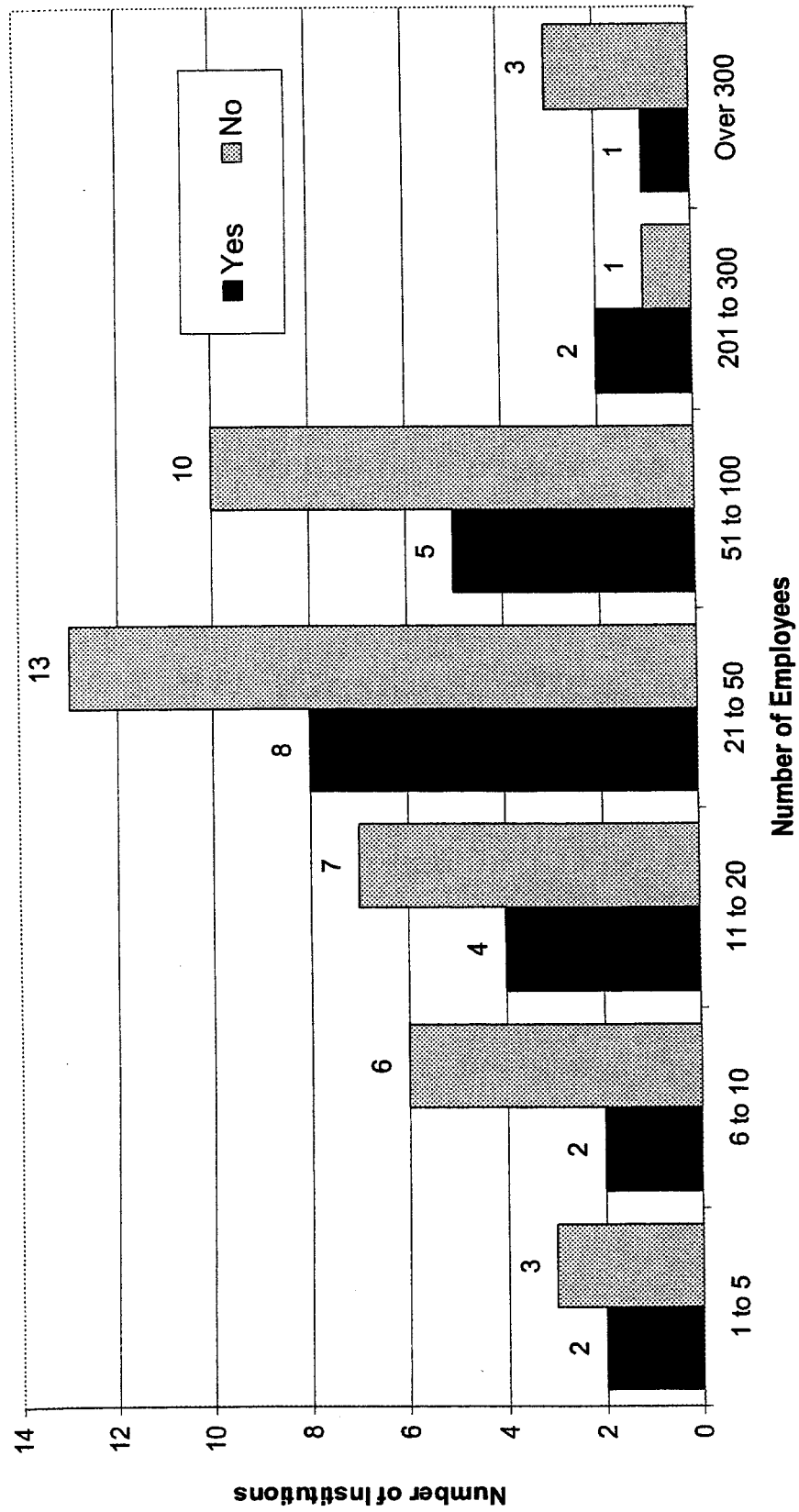


Figure 13: Institutions in which Consultants Responsible for at least a Portion of Web Site Design

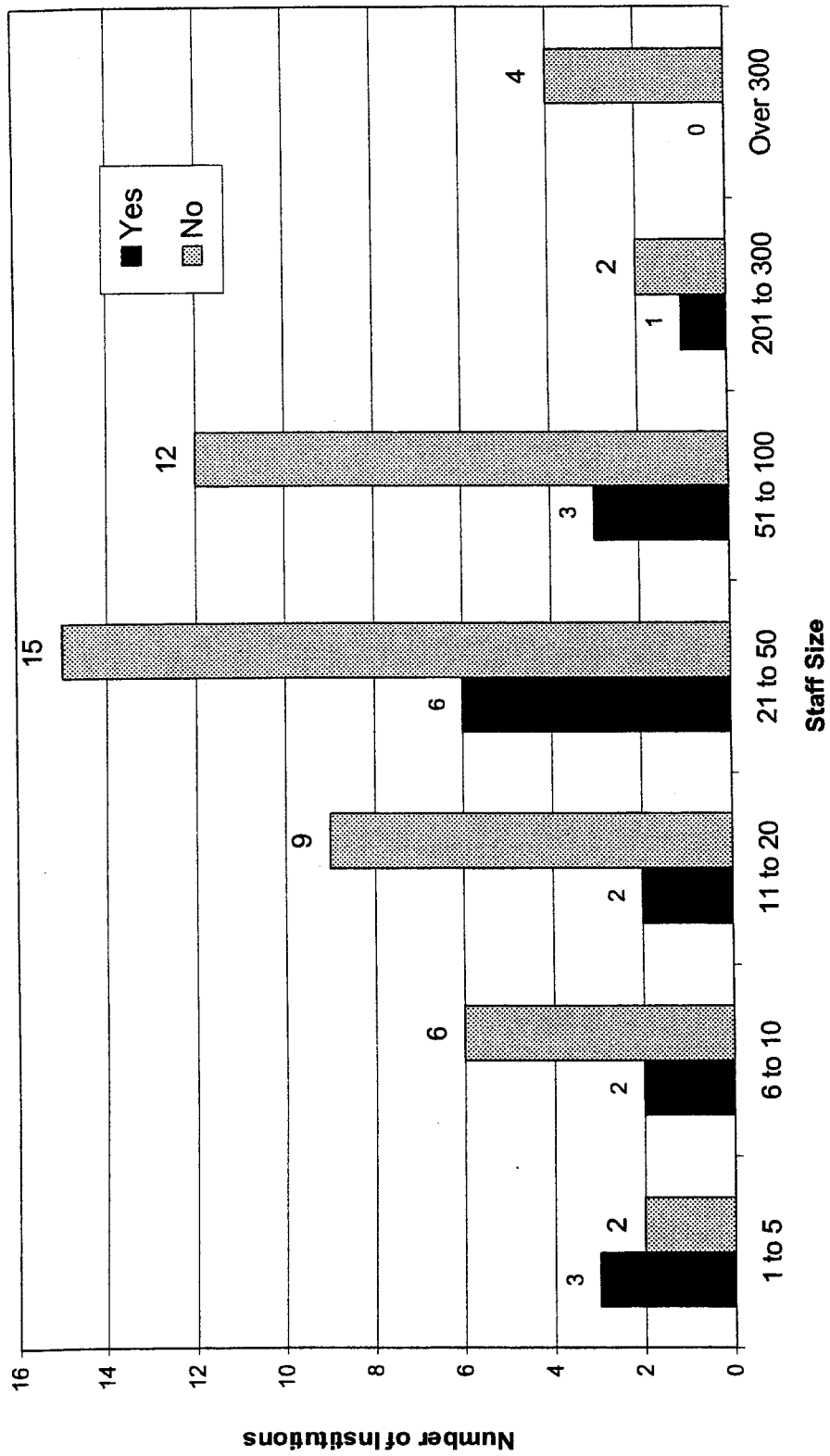


Figure 14: Institutions in which Director was Responsible for at least a Portion of Web Site Design based on Number of Staff

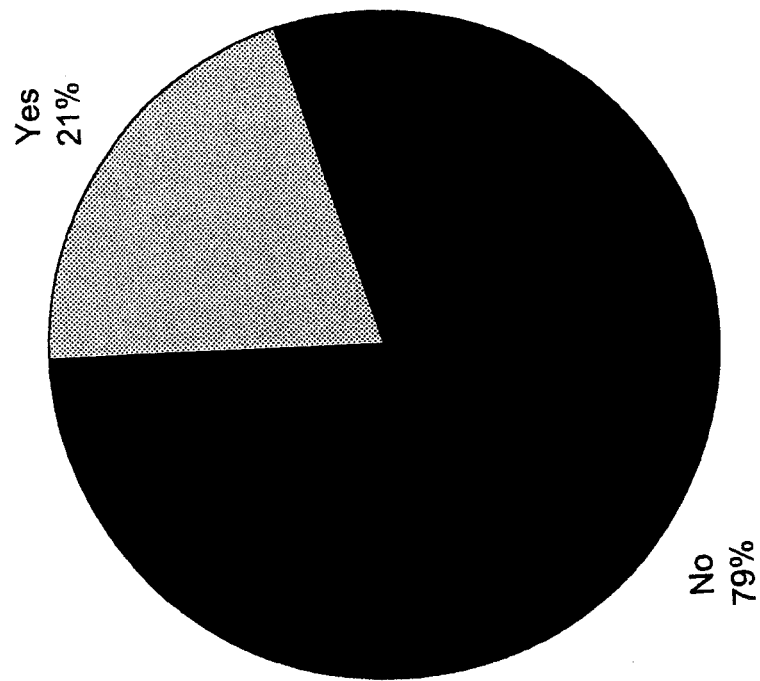


Figure 15: Percentage of Institutions that Serve as their own Internet Service Providers

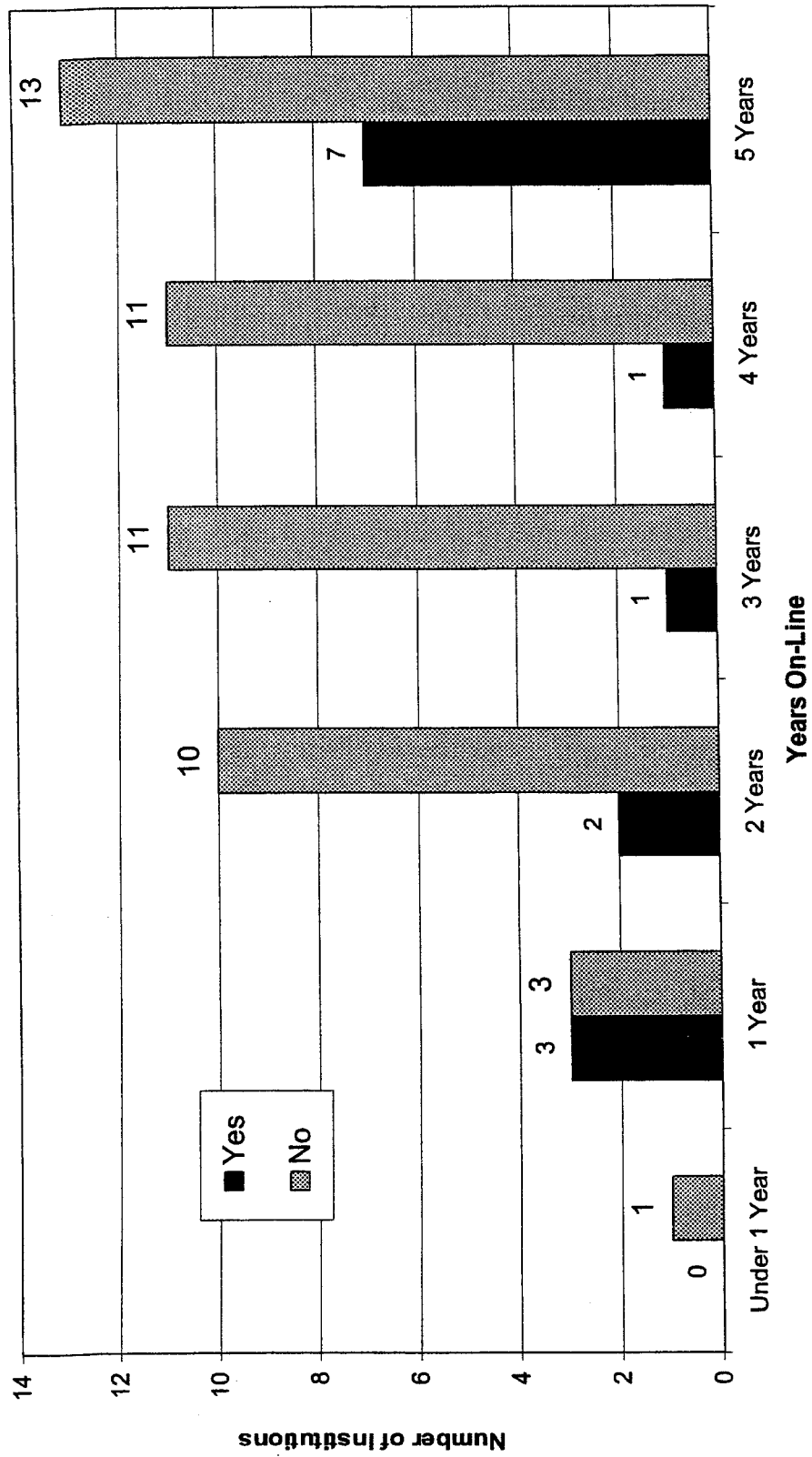


Figure 16: Number of Institutions Serving as their own Internet Service Providers versus the Length of Time On-line (Years)

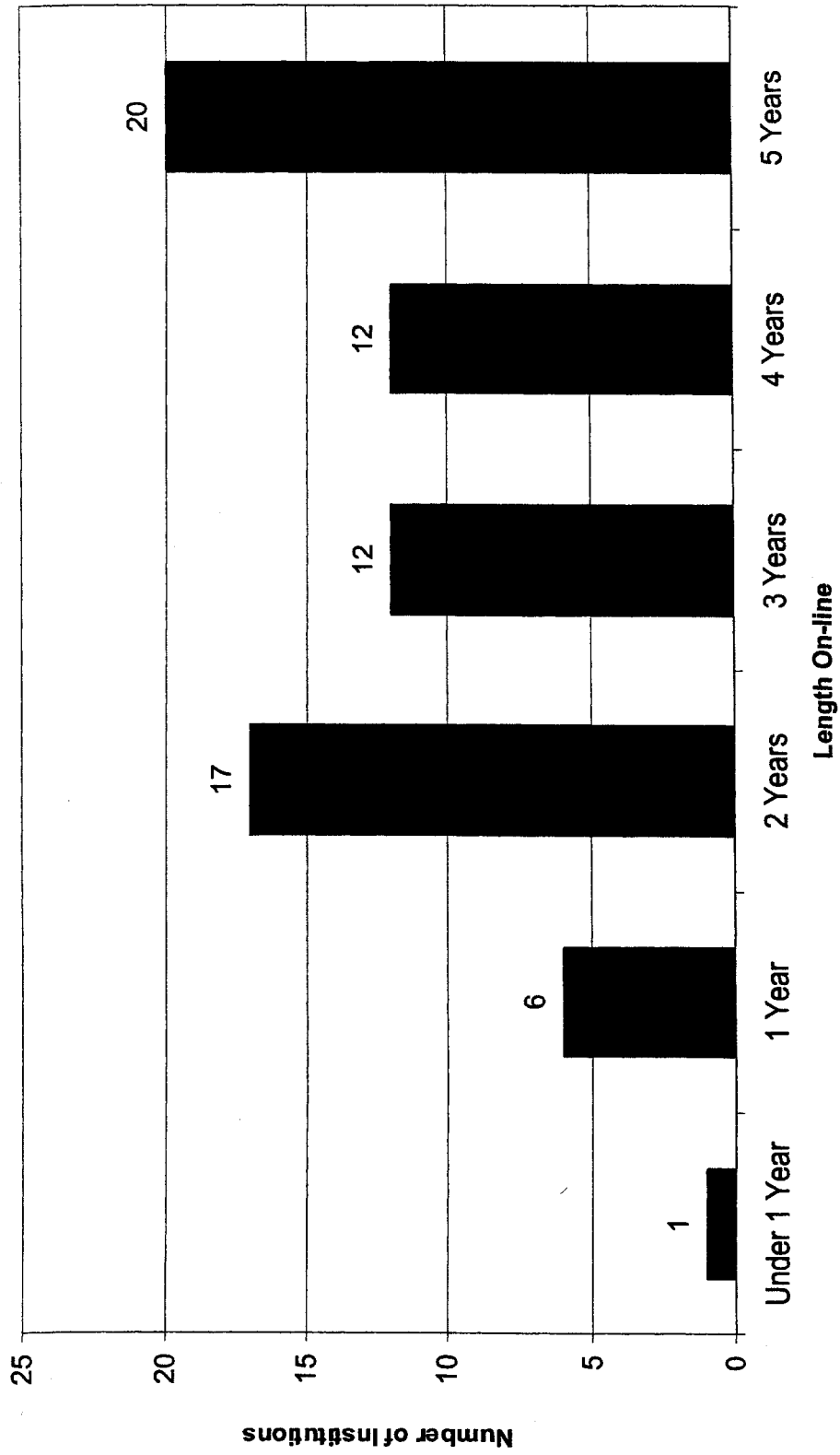
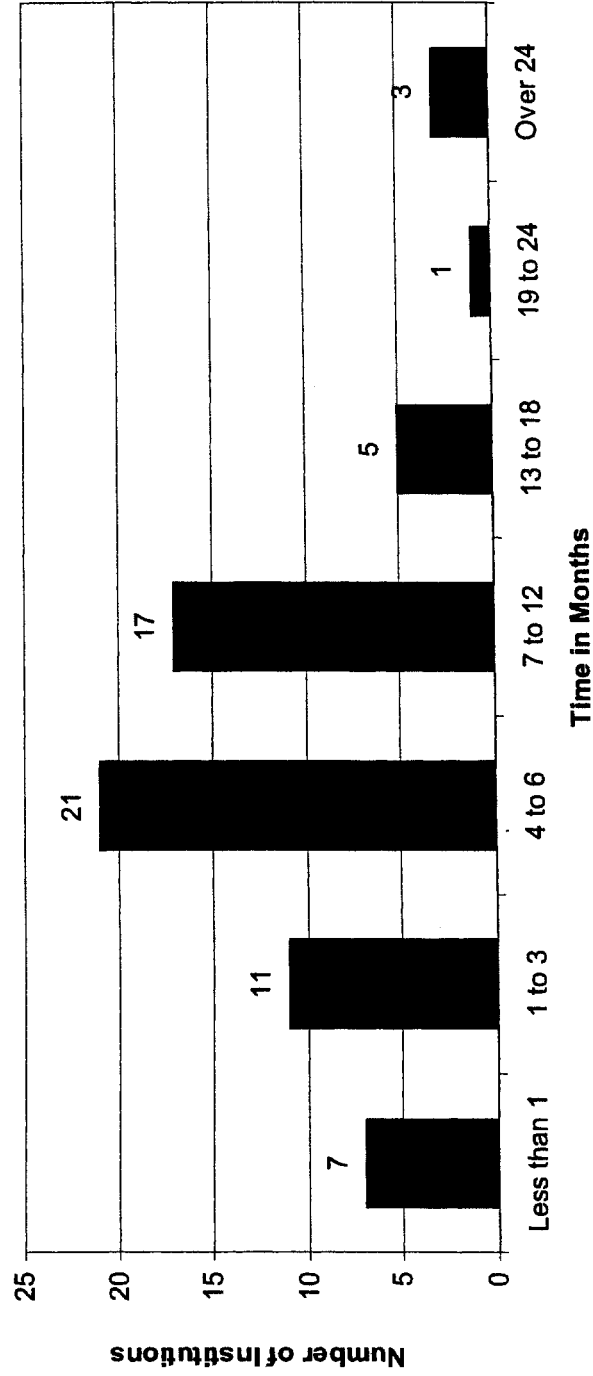


Figure 17: Age of Responding Institutions' Web Sites in Years



**Figure 18: Length of Planning and Development of
Responding Institution's Web Sites in Months**

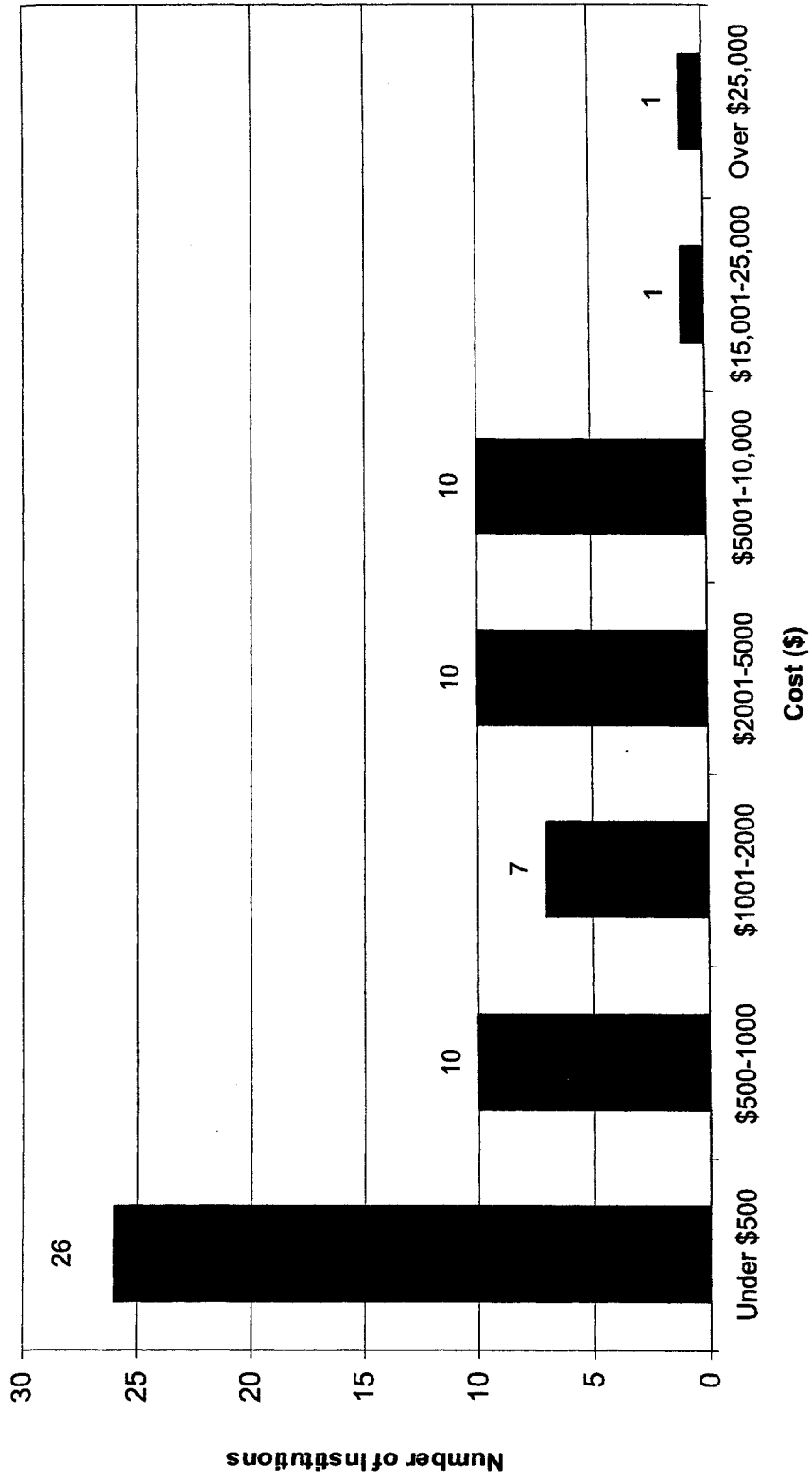
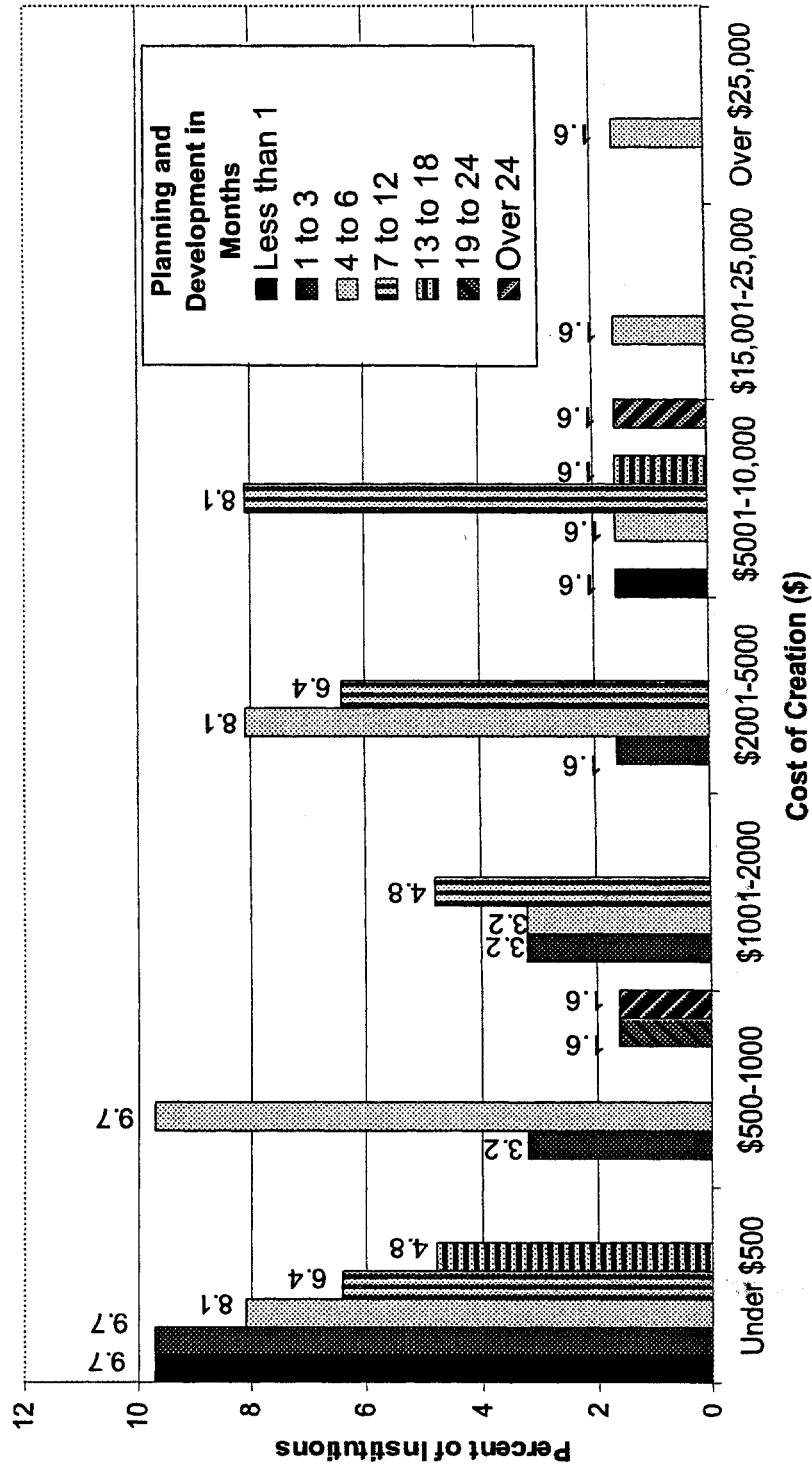


Figure 19: Institutional Cost in Dollars of Web Site Creation



**Figure 20: Time Spent in Planning (Months) vs. Cost of Creation (\$)
for Institution's Web Sites (%)**

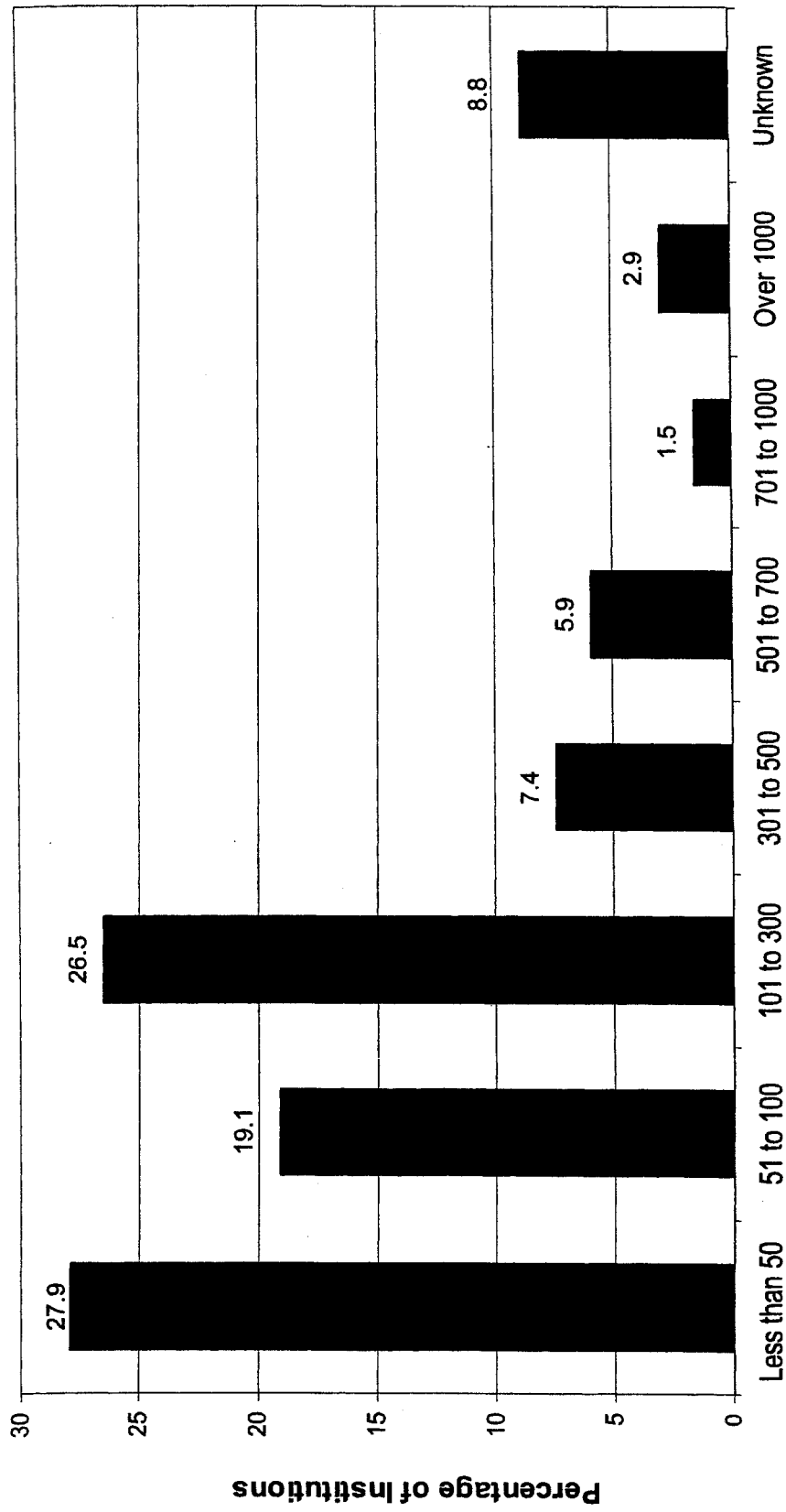
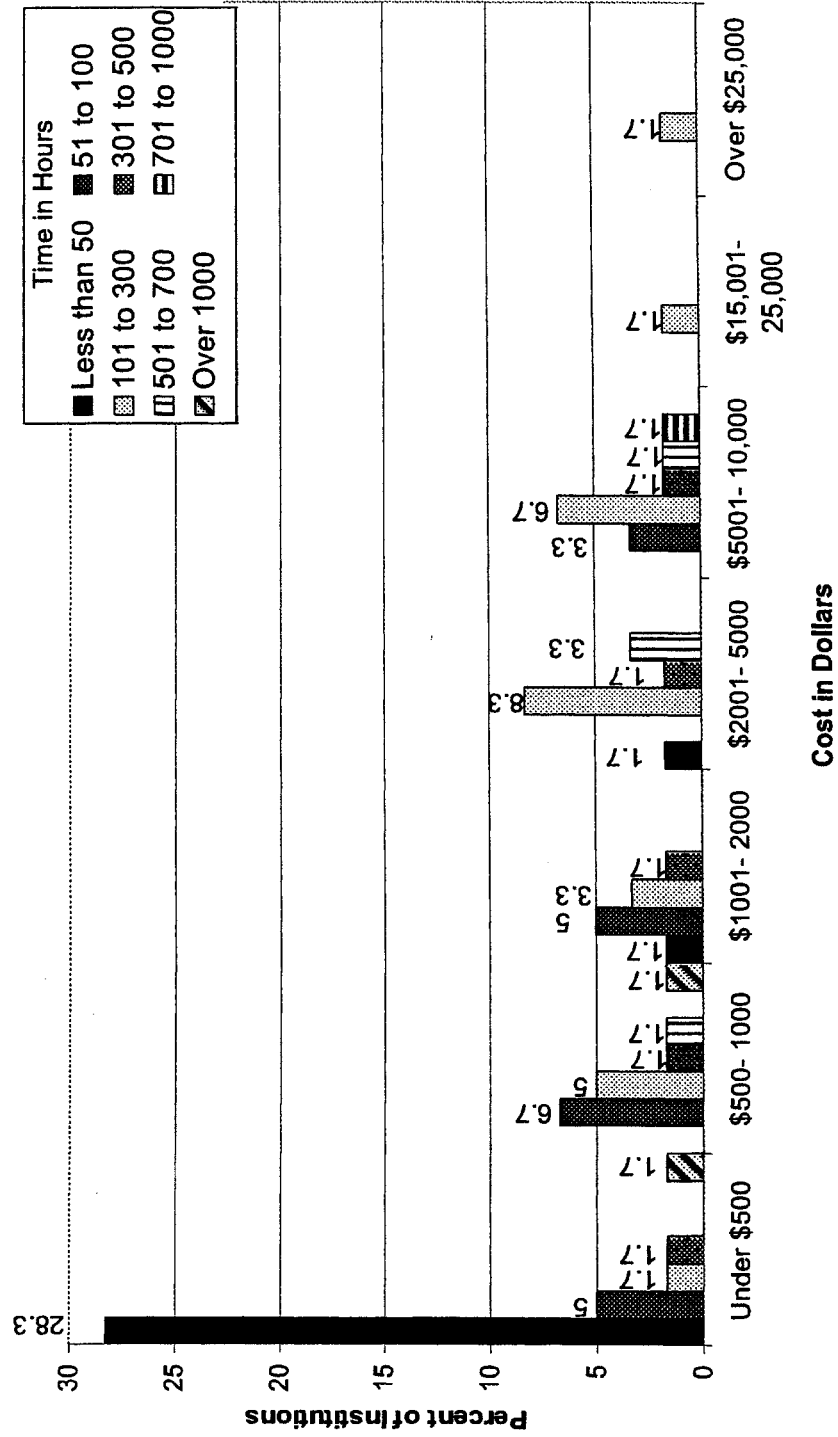
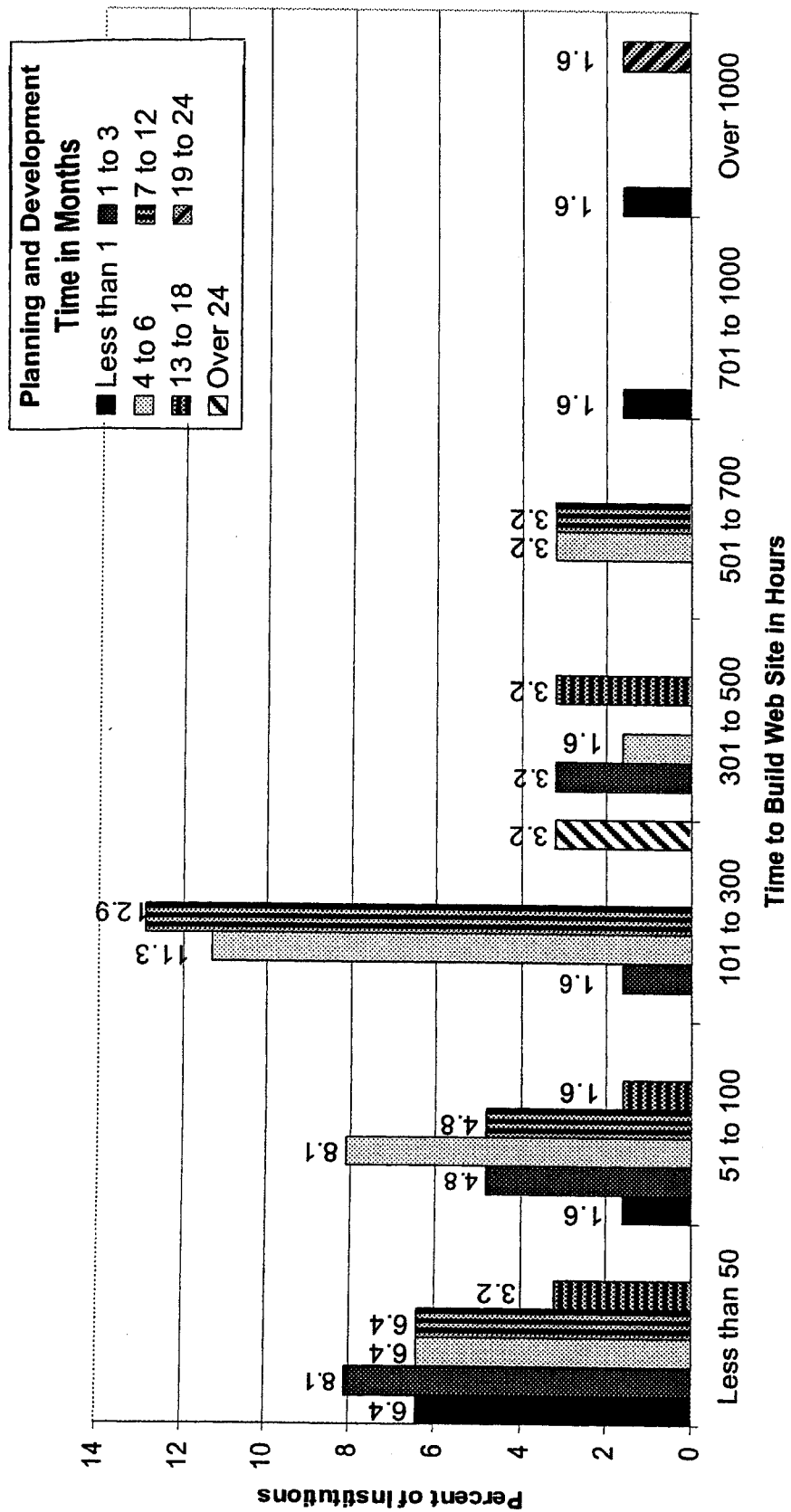


Figure 21: Institutional Time in Hours Spent to Build Web Site



**Figure 22: Cost in Dollars for Institutions to Build Web Site
Categorized by Hours Spent to Build Web Sites**



**Figure 23: Percent of Institutions Versus Institutional Staff Time Spent
Categorized by Time Spent in Planning and Development in Months**

Web Site Maintenance

Web Site Updates

A Web site should be regularly updated. Updates include adding new content, removing out-of-date content, and updating links out of the site which may have changed. Without regular updates, a Web site is less useful to online visitors and to the garden. As a promotion tool, a public garden Web site can indicate to visitors what plants are in bloom, what educational programs are occurring, and multitudes of other information about the institution.

Respondents in 98.5% of the cases do update their Web site. The frequency of the updates ranged from daily to bi-yearly (twice a year) (Fig. 24) (p. 50). Of the institutions which perform Web site updates, daily updates were reported in 12.1% of the cases, once a week in 10.6%, every two weeks in 9.1%, monthly in 33.3%, seasonally (every three months) in 28.8%, and bi-yearly in 4.5% of the cases. Another 1.5% reported updates were done when necessary. Each garden should consider the amount and type of information they have available on their Web site to determine the frequency of necessary updates. A garden with a larger and more detailed Web site will need to update more often than one with a few pages of general information which does not change often.

Maintenance Responsibility

In considering the frequency of Web site updates, it is important to consider who will be completing these updates. By having one or two people in charge of this

task, it should be done in a more organized fashion than by having a large group in charge. In the responding institutions, the following positions or departments were responsible for the Web site updates; marketing department (36.8%), Web consultants (25.0%), director (17.6%), administrative assistant (13.2%), education department (13.2%), and technology department (13.2%) (Fig. 25) (p. 51). These results show the wide range of positions of persons who may have the capability and interest in maintaining the Web site.

Identification of New/Updated Information

New Web site content can be easily identified through varying methods. By showing what and where the new and updated content is, the repeat visitor is able to find this information quickly without having to search through the different levels of the Web site's hierarchy. Of the responding institutions, 38% had a method of identifying new or updated information. Of those who identify new information, the top two methods of identification included identification by date (30.4%) and noted on the home page (26.1%). Responses in the middle category include identification; on a calendar (17.4%), by highlighting information (13.0%), on a splash page (8.7%), on a banner (8.7%), by text "What's New" (8.7%), and by color (8.7%). Other methods used were e-mails sent to a registered group (4.3%), inclusion on a "What's New" page (4.3%), and using seasonal graphics or logos to note new content (4.3%) (Fig. 26) (p. 52). Several institutions used one or more of these methods to identify new and updated content.

Annual Cost of Web Site Maintenance

There are many items which are included in the annual costs of having a Web site such as fees to the Internet Service Provider, staff time for updates, and consultant fees. The dollars respondents reported for annual maintenance costs ranged from less than \$500 to over \$50,000 (Fig. 27) (p. 53). Reported costs of site maintenance are as follows; less than \$500 (30.9%), \$501 to \$1000 (10.3%), \$1001 to \$2000 (10.3%), \$2001 to \$3000 (2.9%), \$3001 to \$5000 (14.7%), \$5001 to \$10,000 (11.8%), \$10,001 to \$25,000 (4.4%), \$25,001 to \$50,000 (2.9%), and \$50,001 to \$100,000 (2.9%).

With this broad range represented, leaders of an institution that currently does not have a Web site and has limited resources may wonder if the garden can afford to be on the Internet. The cost of Web site maintenance correlates to the frequency of site updates (Fig. 28) (p. 54). Sites, which reported updates more often than monthly, tended to have the highest costs of maintenance. The cost for daily updates ranged between \$501 and \$100,000 per year. Institution Web sites with weekly updates ranged in price from \$501 to \$10,000. Institutions which are able to update seasonally reported costs up to \$5000, with 16.7% of all institutions being in the under \$500 category. An institution with limited resources of time and money may be able to limit their updates to monthly or seasonally because the types of information which are presented do not change often and are planned well in advance, such as events.

Summary

Public gardens generally update their Web sites monthly or seasonally. The costs associated with maintenance are tied closely to the frequency of updates and should be considered prior to the creation of the Web site. Maintenance duties were generally assigned to marketing staff, the director, or a Web consultant. A garden should consider methods of identifying new information placed on the Web site so return visitors are able to find updates quickly.

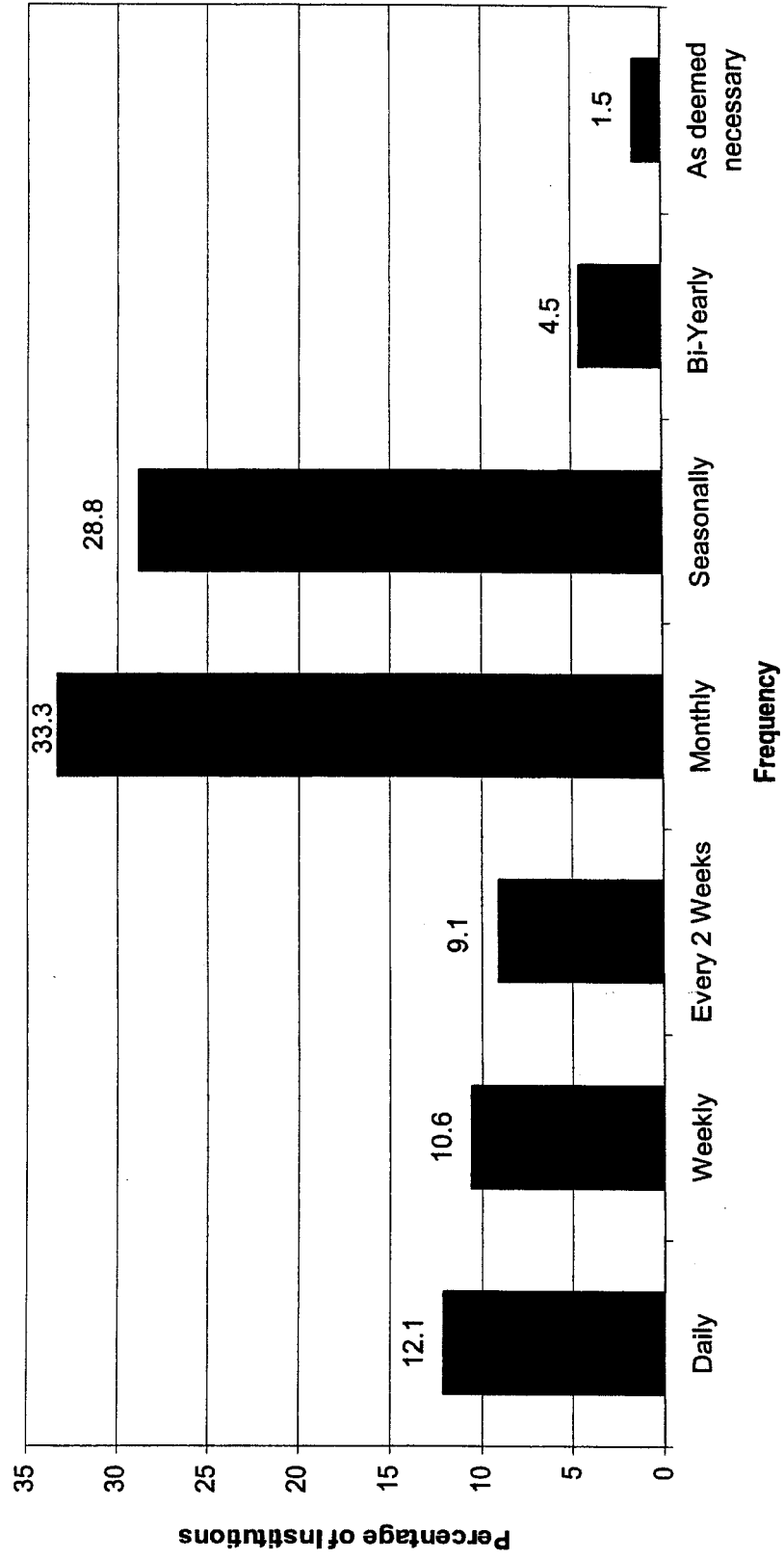


Figure 24: Responding Institutions Frequency of Web Site Updates

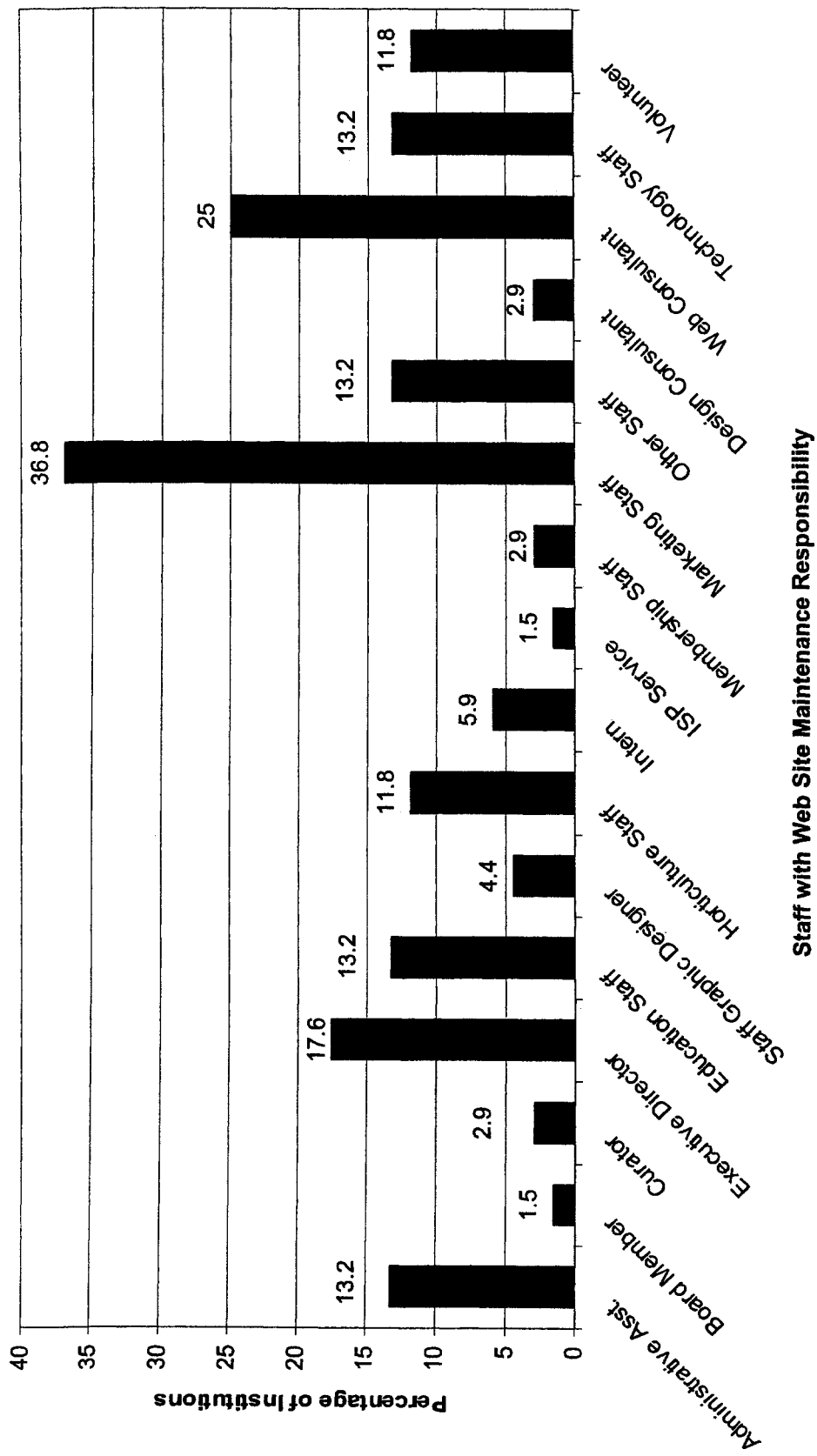


Figure 25: Web Site Update/Maintenance Responsibility by Staff for the Institution's Web Site

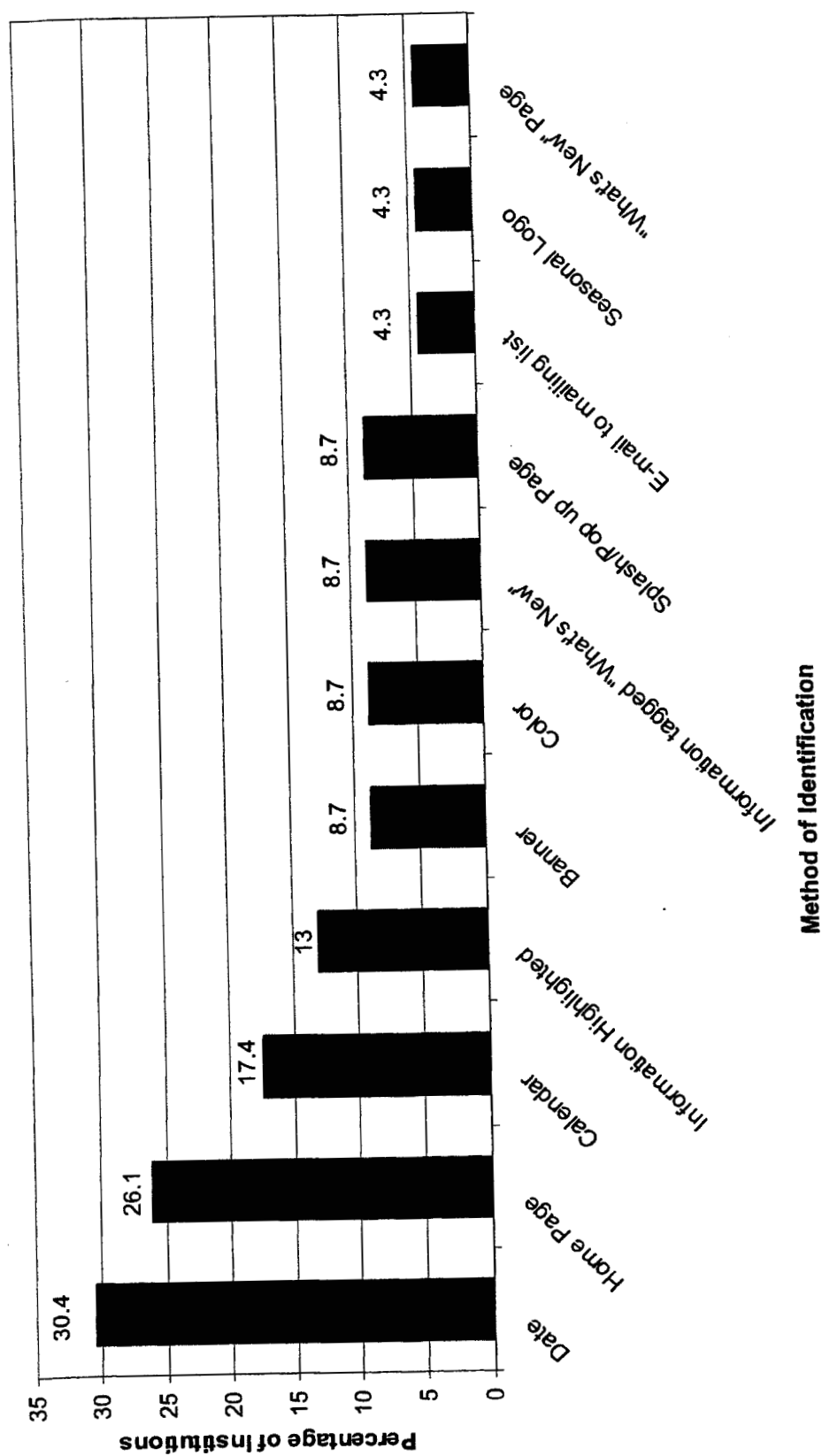


Figure 26: Responding Institutions' Methods of Identifying New and Updated Content

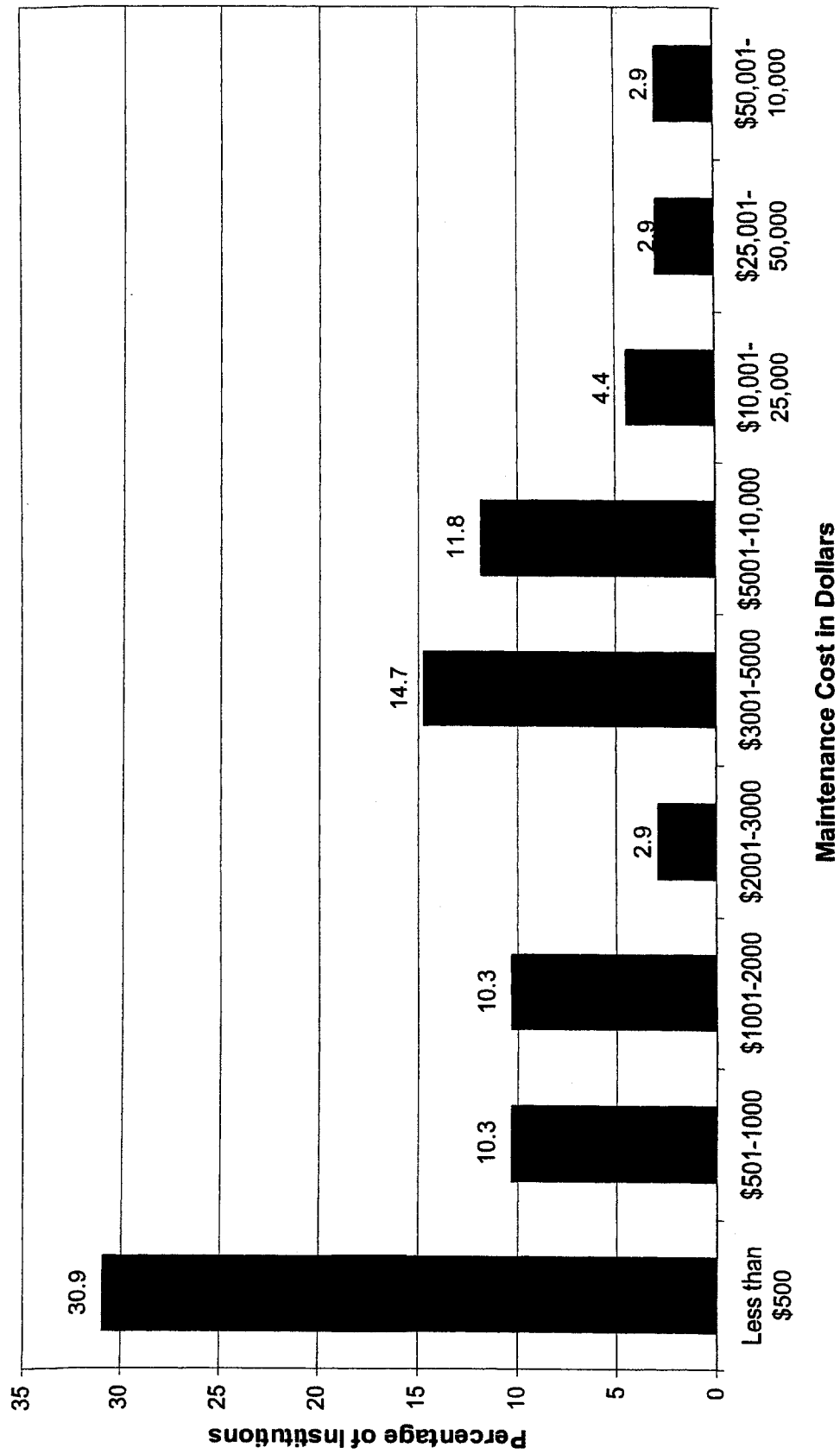


Figure 27: Institutions' Annual Web Site Maintenance Cost in Dollars

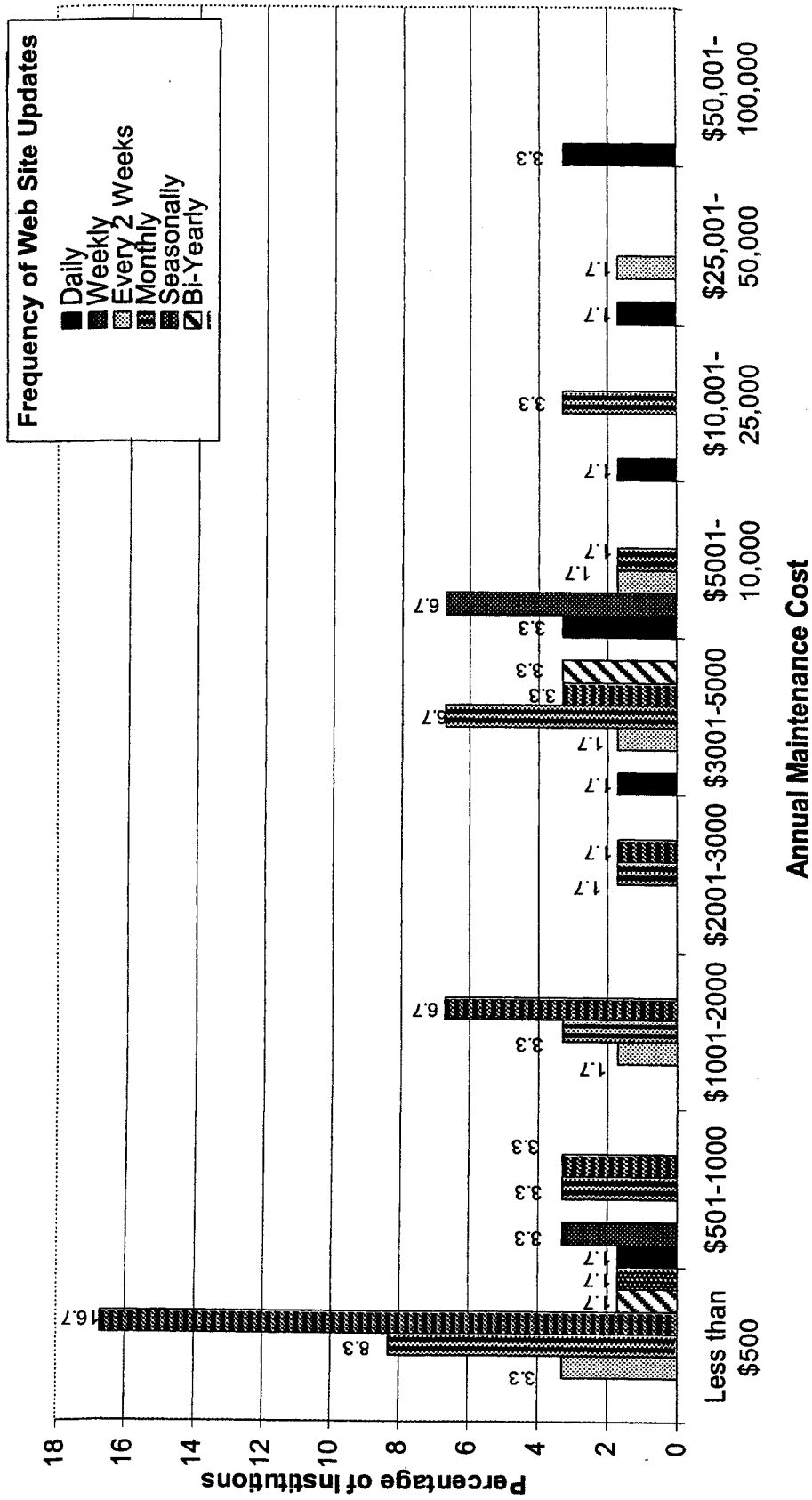


Figure 28: Institution Web Site Maintenance Costs versus Frequency of Web Site Updates

Web Site Content

Plug-in Use and Types

A plug-in is a program which enables a viewer to experience content in different formats which are not supported by the user's Web browser. These formats include audio, video, animation, and three-dimensional virtual reality. Some plug-ins come automatically installed with their Web browser; some need to be downloaded from another Web site in order to be used.

Plug-ins are needed for 29.4% of the responding public garden's Web sites (Fig. 29) (p. 60). Of those Web sites for which plug-ins are necessary, 72.7% provide a link from the site for downloading the appropriate program. Of the Web sites where plug-ins are used, 31.8% have similar content available in a non-plug-in format as well.

Institutions which reported using plug-ins, used the following programs; Adobe Acrobat (80.0%), QuickTime (35.0%), RealPlayer (20.0%), ShockWave (10%), iPIX (10.0%), and Flash (5.0%) (Fig. 30) (p. 61). Adobe Acrobat displays Portable Document Format (PDF) files. This allows the institution to include information with graphics or fonts which would not maintain their original format in a regular Web page format. The PDF format is often used to provide the user with printable brochures, applications, and newsletters (Smith and Bebak, 2000, p. 155). QuickTime allows the user to experience audio and video information including virtual tours. RealPlayer, similar to QuickTime, is a program which enables real-time playback of audio and video files through the use of streaming. Streaming means that

no large files are stored on the user's hard disk because part of the file downloads prior to playing (Smith and Bebak, 2000, p. 151). Macromedia ShockWave Player is used to deliver multimedia to the user, including three-dimensional games and e-merchandising applications. This content is created using Macromedia Director (<http://sdc.shockwave.com/support/shockwave/faq.html>). Flash, another program created by Macromedia, is used for animation on Web sites (Smith and Bebak, 2000, p. 152). iPIX is a program which allows for 360-degree still and video images on an institution's Web site (<http://www.ipix.com>). This technology allows a user to view an area from all angles using just a single image as the beginning.

A Web developer should carefully consider what types of content they wish to deliver and the types of plug-ins that would be necessary for the user to experience the content. Including a link to the Web site for downloading the associated plug-in may help cyber visitors gain more from the Web site and create an easier visit. The developer should be careful to have information which is viewable by users who do not wish to download new plug-ins. Care should also be taken to use common plug-ins rather than the newest technology.

Interaction with Web Site Users

Interactive is defined as "of a form of television entertainment in which the viewer can affect events on the screen (American Heritage Concise Dictionary, 1994, p. 437)." In relating this term to the Internet, interaction can be considered any way in which a user is able to communicate with, choose activities, personalize, or have a different experience than another person. In public garden Web sites, there are many

methods in which interactivity is promoted. Fifty percent of the respondents considered portions of their Web site to have interactive elements. The following elements were named as the methods of interaction (Fig. 31) (p. 62); option to register (37.5%), ability to e-mail garden (20%), ability to sign guest book (17.5%), ability to partake in on-line polls or surveys (15%), ability to view video clips (15%), ability to use live cameras (12.5%), participate in interactive games (7.5%), and use plant database or order plants (7.5%). Through these methods, gardens are creating more interesting content to help reach their goals.

Links to Other Web sites

The Internet is a platform which allows users to connect to additional resources with a single click of the mouse. This creates opportunities for Web sites to enrich their message, make a visit easier, and help the user learn more about their site. It was reported that 76.5% of the responding institutions provided links from their Web site to other sites and 23.5% did not have links to other institutions (Fig. 32) (p. 63).

The reasons why links were chosen was also examined. The reasons for including a link to another Web site included; relevant horticultural and educational value (46.0%), links are to affiliate gardens, sponsors or parent institution (30.0%), links are to other gardens to visit (26.0%), links to local or regional destinations and information (24.0%), links were recommended and/or approved by staff (20.0%), links are to other non-profit institutions (12.0%), links to national associations and resources (10.0%), links chosen based on public request (6.0%), chosen based on

content (2.0%), chosen based on design quality (2.0%), and chosen based on institutional policy (2.0%) (Fig. 33) (p. 64). Institutions should have a method for choosing links and use it in order to link only with sites that support their overall mission and goals.

One of the challenges of the Internet is keeping visitors on your site. Providing links encourage people to leave your site. Links can be created to open up a new browser window rather than taking the user to the new site. Thus, once the user is finished looking at the linked site, they will be returned to the institution's Web site by closing the linked site's browser window.

Collaboration on the Internet

Collaboration is also possible on the Internet because of the potential of linking institutions which can benefit each other. For example, a group of area gardens can link with each other to provide additional information to visitors of the area in an easy to maneuver format. This collaboration can be furthered by including links to area visitor's bureaus, tour companies, and other sites which may help entice a person to visit the institution. Of the responding institutions, 47.8% are using collaboration in their Web sites (Fig. 34) (p. 65). The types of collaborations include links to other local cultural institutions, the chamber of commerce, conventions and visitor's bureau, city's Web site, universities, regional gardens, state parks, and other area attractions.

Summary

Increasing the content of an institution's Web site should help users find more in depth information. Interactive content can be provided in many forms on a public garden's Web site. Having links to other related sites may help the Web site user plan a visit or learn more information about the garden and its mission. The use of collaboration through links may help a garden gain more exposure and thus increase visitation.

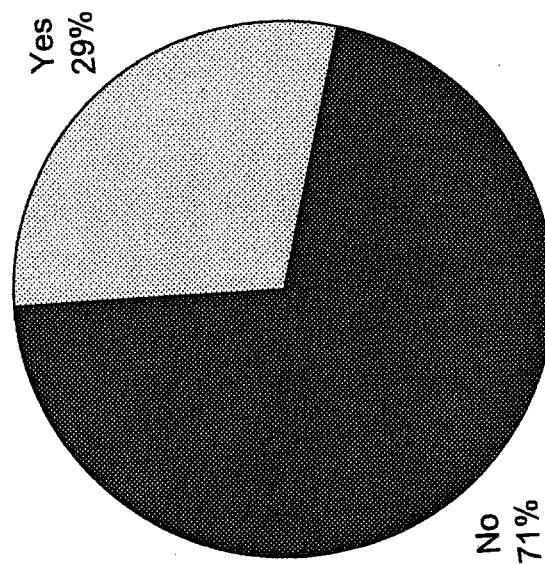


Figure 29: Percentage of Public Garden Web Sites Requiring Plug-Ins to Access Content

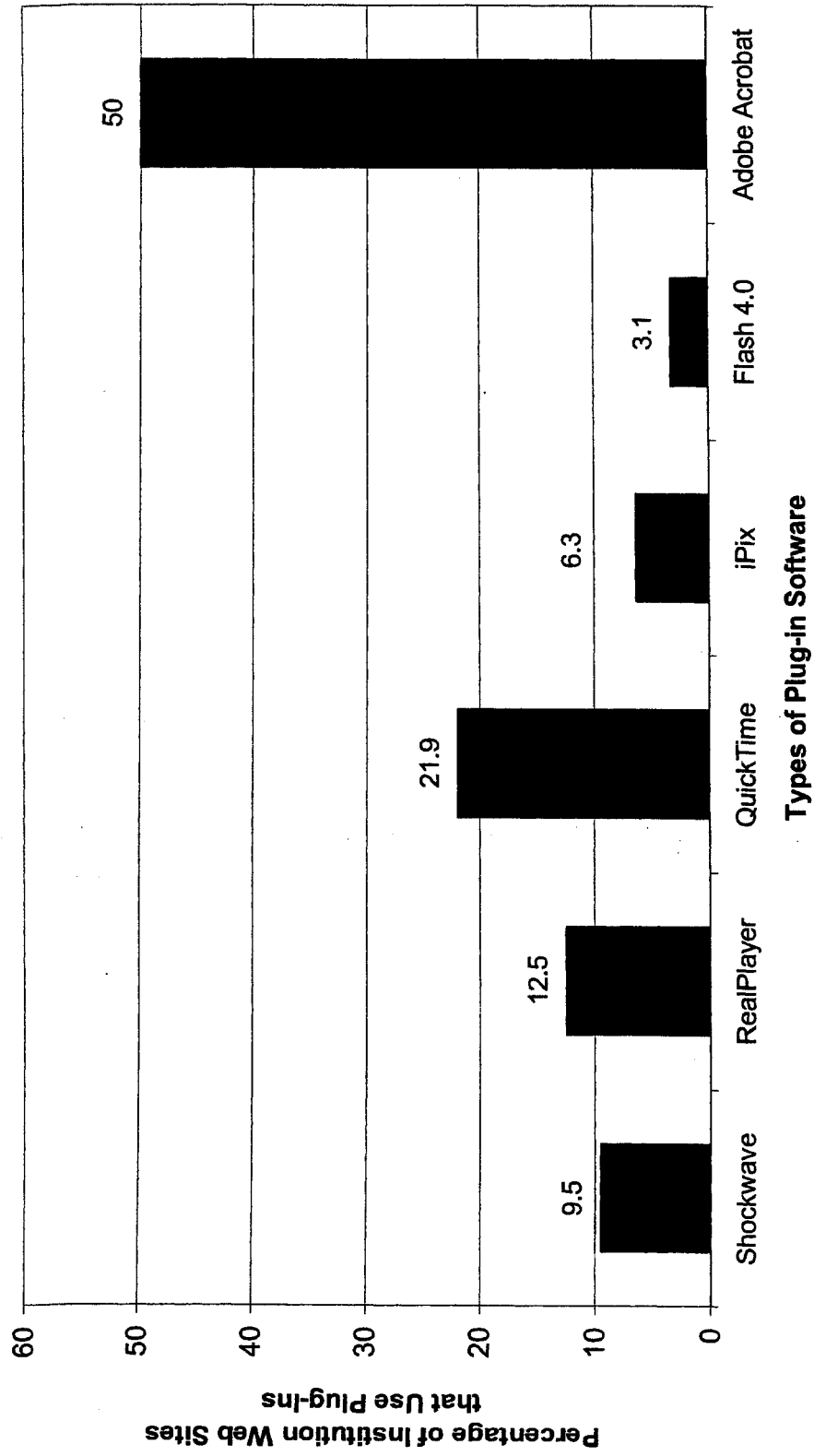


Figure 30: Percentage of Institutions using Different Plug-ins for Web Content

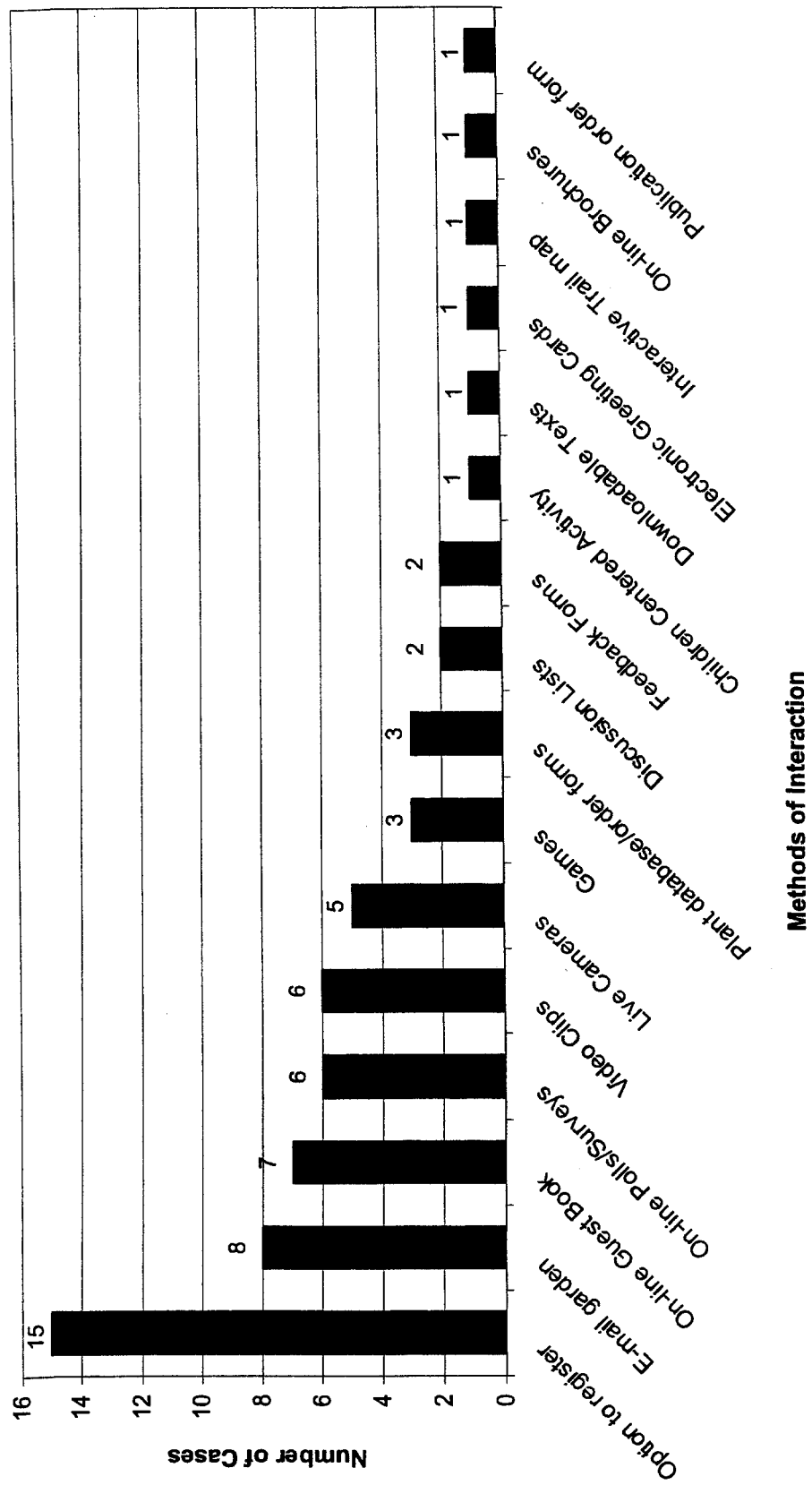


Figure 31: Methods of Interaction on Web Site

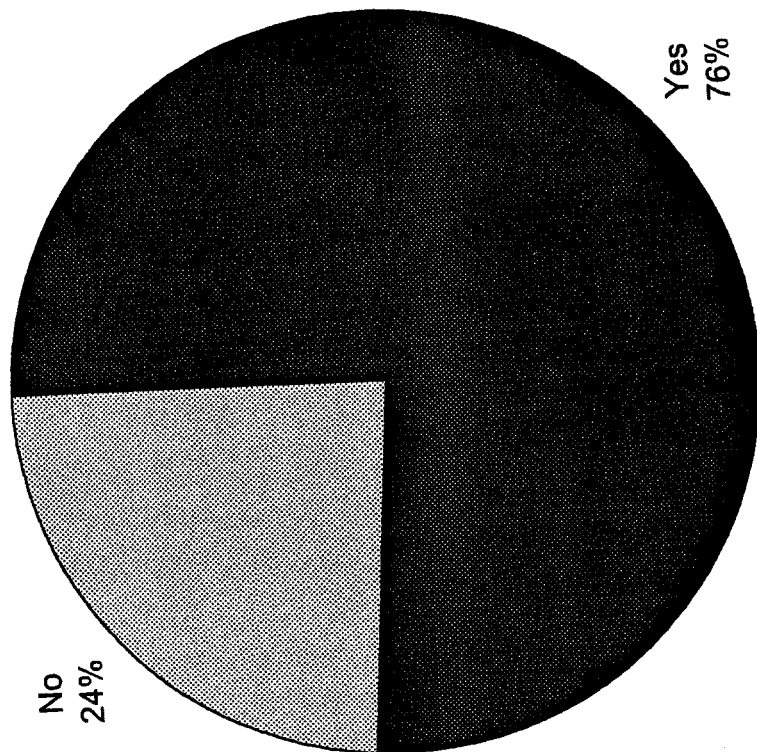


Figure 32: Percentage of Web Sites Providing Links to Other Web Sites

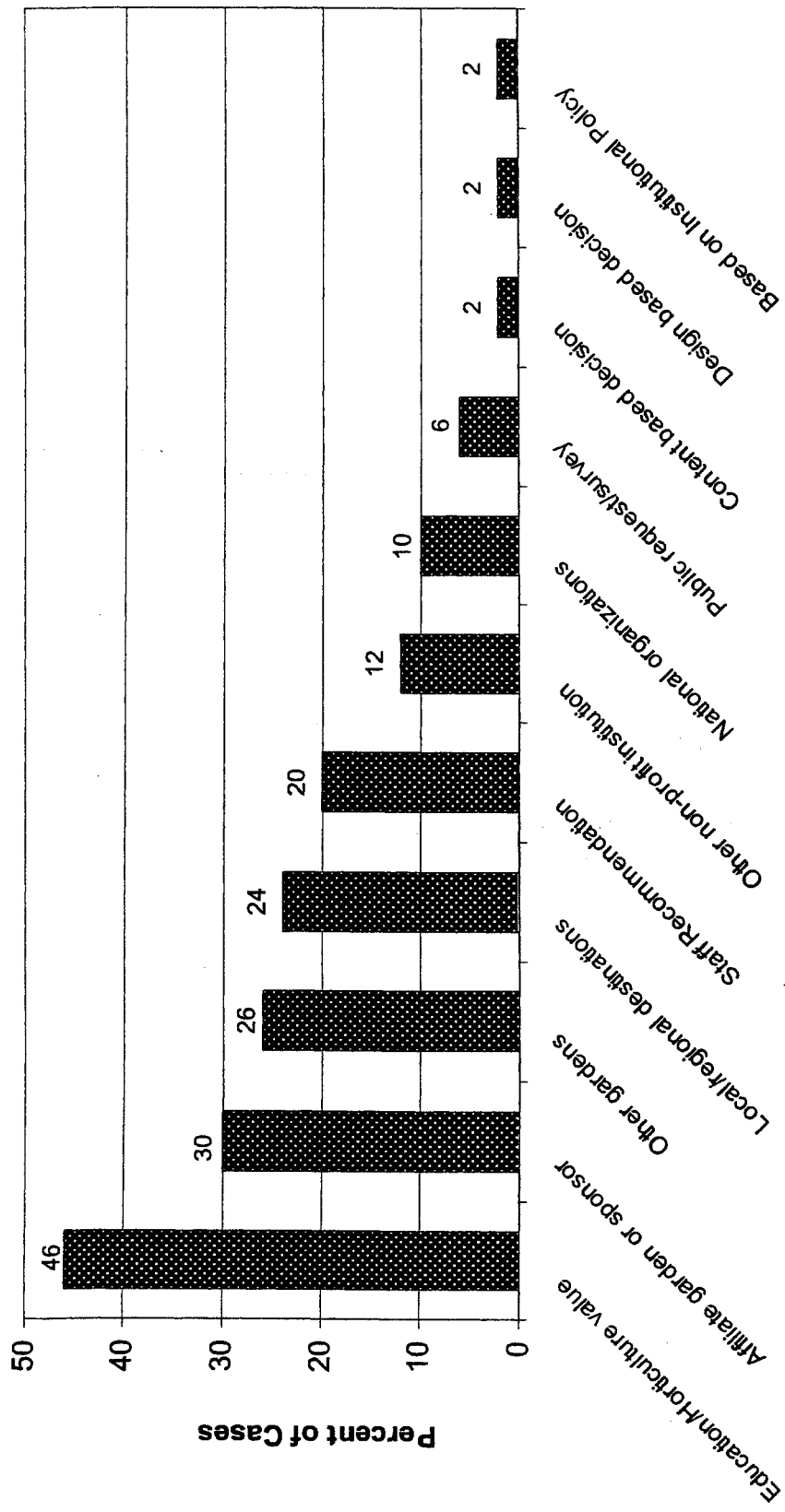


Figure 33: Reasons for Garden Personnel to Choose Linked Institutions

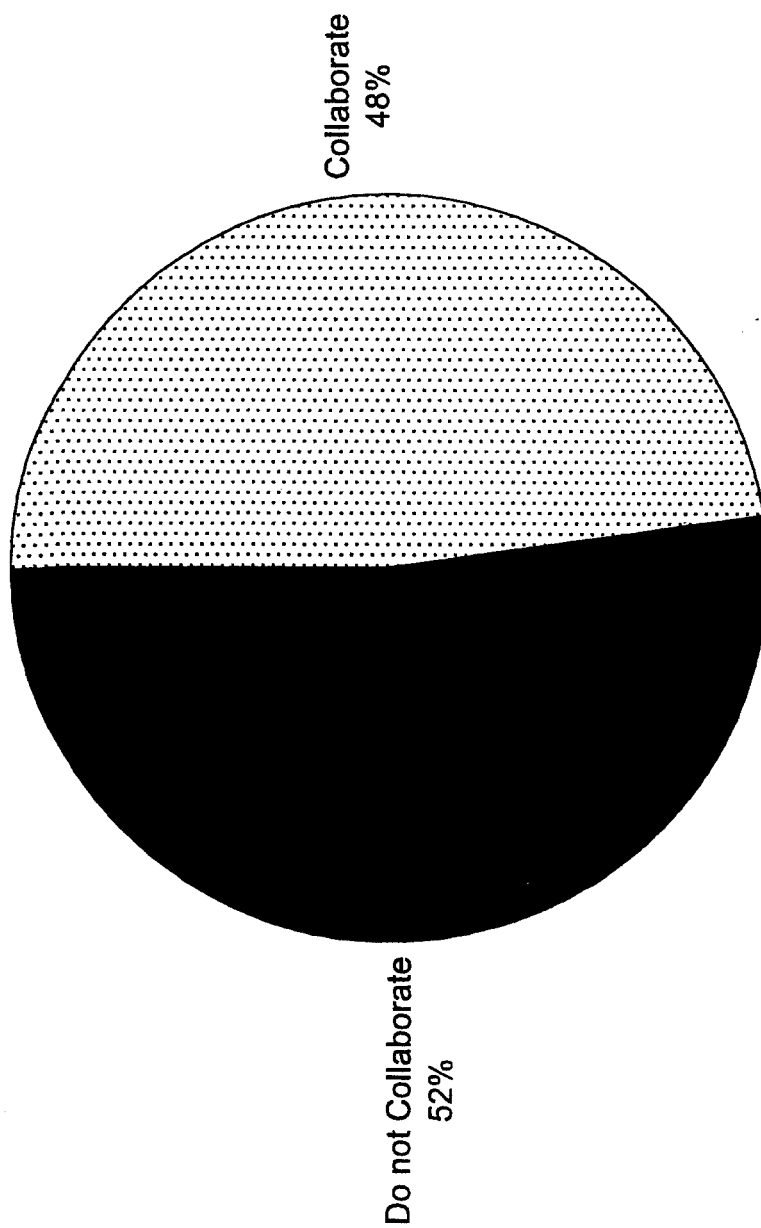


Figure 34: Percent of Gardens using Collaboration to Promote themselves on the Internet

Web Site Analysis and Testing

Analysis for Usability

Web site usability is defined as:

“the broad discipline of applying sound scientific observation, measurement, and design principles to the creation and maintenance of Web sites in order to bring about the greatest ease of use, ease of learnability, amount of usefulness, and least amount of discomfort for the humans who have to use the system” (Pearrow, 2000, p. 12).

The study of a Web site for its usability is an important step to determine how well your message is being received by the world. Usability studies include many areas not limited to design, colors, navigation, and the overall experience. Only 30.9% of the respondents had completed some form of usability testing for their institution’s Web site. The systems used included focus groups (28.6%), interviews (19.0%), on-line systems analysis (4.8%), review by design or programmer professionals (28.6%), user surveys (23.8%), and log data analysis (57.1%) (Fig. 35) (p. 69). Information learned through these forms of analysis included that the site needs to be registered with additional search engines, the site is usable for people with disabilities, the site needs to be redesigned to improve content, analysis ability, and interactive navigation potential, and what pages are the most visited.

Web Log Data

One method of learning about the institution’s Web site is through collecting and analyzing Web log data. Log data can be collected through the Internet service provider as a software package. The information that can be found includes “how

many people are visiting, where they come from, and which pages they are viewing (Turlington, 1999, p. 409).” There are also many programs which can be purchased to assist in analyzing log data. Responding institutions collected log data in 57.1% of the cases. The use of log data by these institutions was used to track print advertising success (2.7%) (Fig. 36) (p. 70), update meta tags for search engine submission (2.7%), determine which pages were viewed least often (5.4%), learn which pages are used most (8.1%), make sure information was posted in a timely manner (2.7%), and to redesign the Web site (21.6%). Several of the institutions which collect the data have not yet analyzed and applied the data to their Web site (56.8%).

Marketing Methods

According to Susan Briggs, “as a promotional tool, the Internet is a new and highly powerful medium which cannot be ignored. It should not be seen as a replacement for other promotional activities, but as an expansion of existing ones, which gives consumers greater choice...” The Web site itself should be marketed. Responding institutions utilized many different marketing methods including having the Web site address on institutional print material (26.7% of responses), having the site address on non-institutional print advertising (20.8%), having links from other institutions (20.3%), registering with search engines (19.5%), on television and radio advertising (8.5%), on newspaper articles and other public relations pieces (0.8%), on business cards (0.4%), on institutional coupons (0.4%), and by word of mouth (0.4%) (Fig. 37) (p. 71). Using a broad range of these methods should aid in furthering the use and knowledge of an institution’s Web site.

Summary

Public gardens used focus groups and professional review to determine their Web site's usability. Web log data analysis can also provide cues to help the Web designer change the site so information is easy to find. By marketing the Web site in various methods, a public garden may expand both their audience size and the knowledge the audience has available through the Internet.

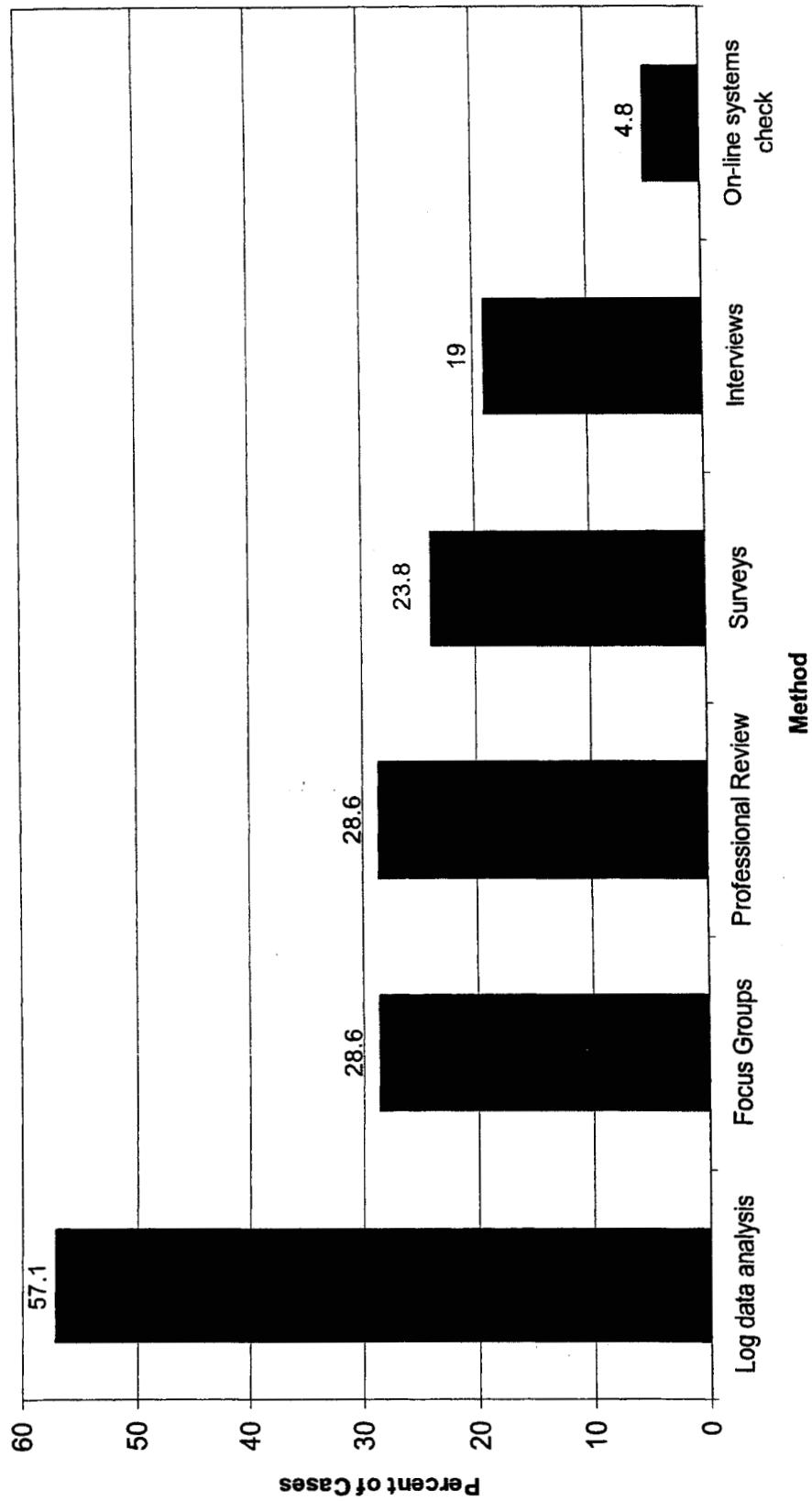


Figure 35: Methods of Usability Testing

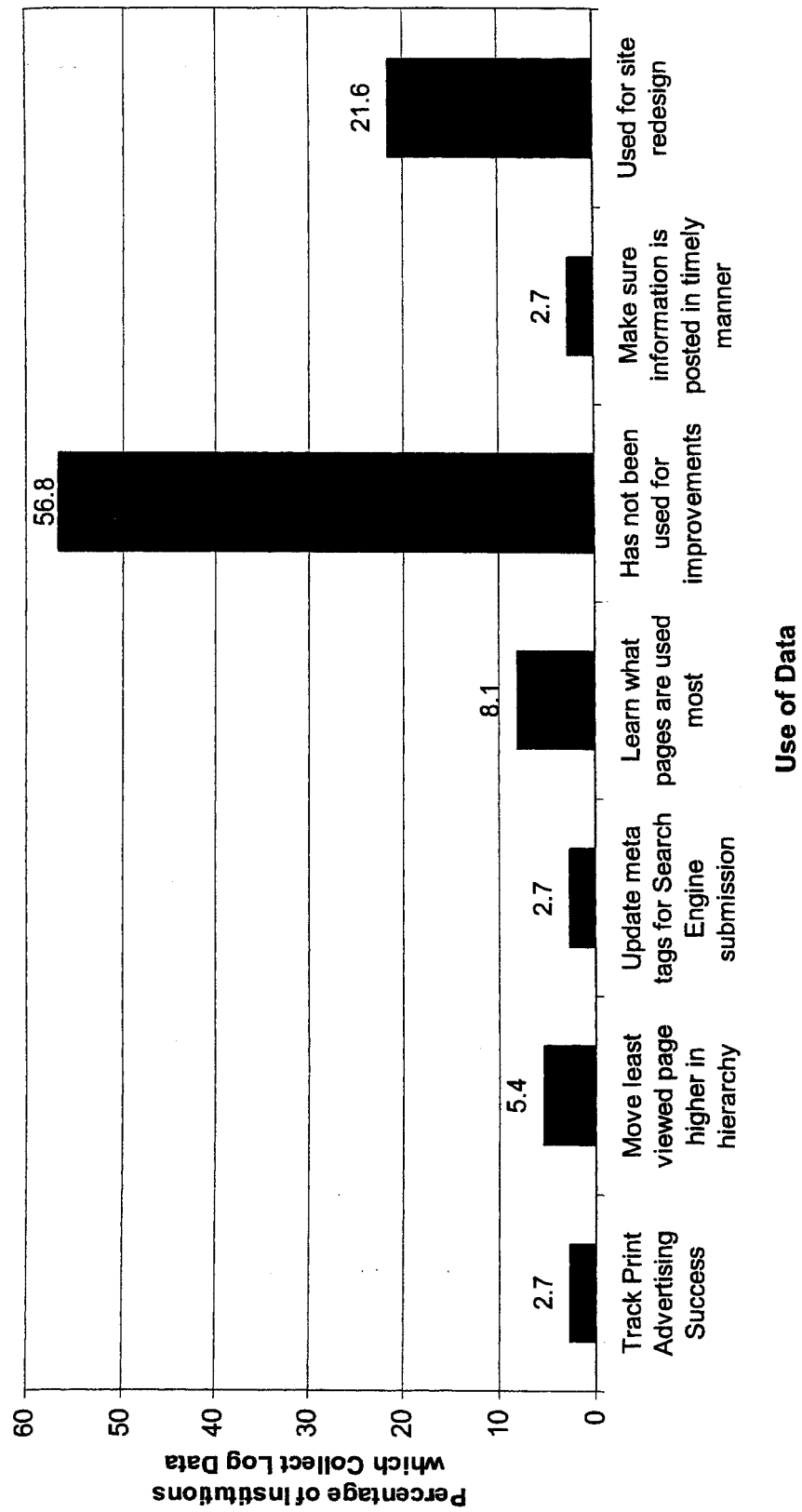


Figure 36: Use of Web Log Data by Institutions which Collect Data

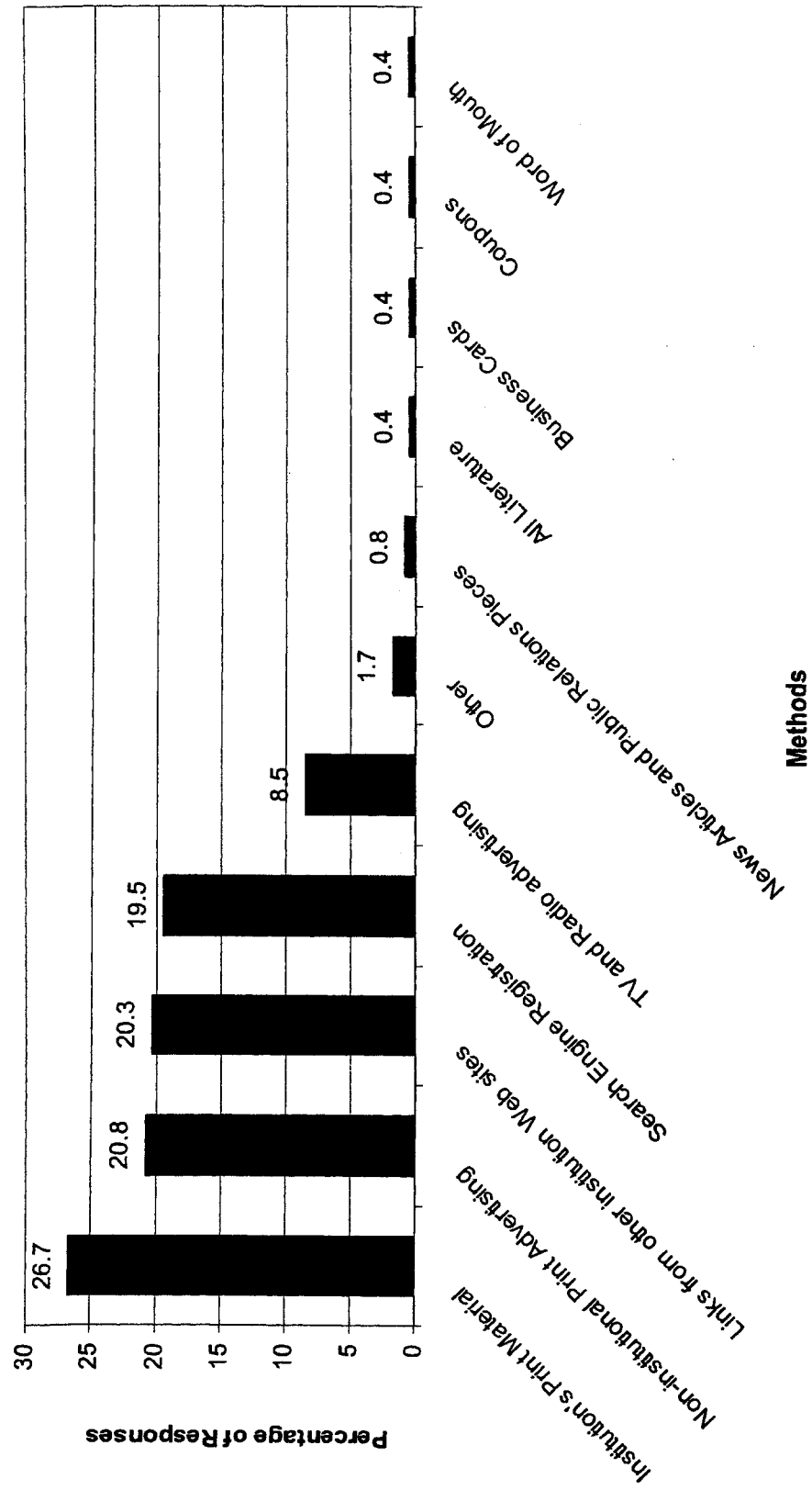


Figure 37: Methods of Marketing Institution's Web Site

Chapter 4

CONCLUSIONS AND RECOMMENDATIONS

This thesis provides a picture of the current state of Web site use by public gardens in the United States. Many institutions are using Web sites for promotional purposes and to provide information to their visitors.

After reviewing the information collected through the surveys and observing numerous Web sites, I conclude that public gardens are making good use of the Internet overall to promote themselves. The uses of interactive mechanisms on many of these sites show that public gardens are following the lead of many museums with Web sites. Searchable plant collections, educational games, and discussion lists are all examples of how garden Web sites are able to interact with their audience and educate. This educational component also may help fulfill a portion of the garden's mission. The information provided about the institution, be it hours of operation and admission charges or special events and classes, will help Web site users plan a visit.

Public gardens are able to provide content which is unique due to the variance in missions, locations, collections, and surrounding communities. If the garden's staff can determine what information is desired by Web visitors and provide this information in an interesting manner, then the garden will be filling a niche in the virtual world, just as they do in the real world. For example, a rhododendron garden should be able to provide information and resources which would help the Web site visitor learn more about the garden's collections at a minimum. Ideally, the content

can be enriched to include additional information, such as how to correctly plant a rhododendron or information about research occurring at the garden.

Public gardens need to analyze their Web site for usability and accessibility. Public garden professionals are concerned with people of all ages being able to view their collections when visiting the garden. They should be similarly concerned with how their Web site appears to someone with color blindness or other disability. Less than one third of public gardens surveyed have completed usability studies. Methods of Web site analysis should be considered as a portion of the maintenance time and expense.

After analyzing the costs associated with having a Web site, I recommend that all public gardens should have an Internet presence. In many cases, the time and money costs are quite low compared to the potential benefits that come from having information available on-line twenty-four hours a day. Many of the gardens considered one of the purposes of a Web site to help answer questions of potential visitors. The amount of staff time spent answering and returning phone calls of potential visitors is potentially staggering. Frequently asked questions can be included on the Web site to reduce the strain on busy staff members. A link to e-mail inquiries should be included. These questions should be answered quickly. The types of questions asked should be recorded so that the Web site can be updated with the pertinent information.

The benefits of having a Web site will not be realized if the Web address is not publicized. The garden should register with the major search engines, providing powerful key words so they will be listed high on the list of hits received by the requesting party. The URL should be included on all publicity materials. The Web site name needs to be easy to memorize so it is easy to find on the Internet. A

majority of public gardens have Web addresses in the form of <http://www.gardenname.org>. Following this format will help users quickly find the Web site. The garden may wish to register additional domain names which might be used, such as .com and .museum. Registering additional names will help protect the institution in the future from people who may want to profit from the name.

If a garden feels they are unable to afford to create and maintain a Web site, they should consider finding sponsorship or working with an educational institution. Many high schools and colleges have courses where students are required to create Web sites. By working with a student, the garden may be able to get a well-designed Web site and help a student in their education. Public gardens may also consider using an intern or volunteer to maintain the Web site to decrease the demands on staff time. If this is done, there should be resources available to help them, either a staff member with Internet knowledge, a consultant, or reference books for the programs used. Another resource for public gardens to consider is Garden Web (<http://www.gardenweb.com>). This Web site allows public gardens to create a one page information sheet on the Internet including their basic information including the URL address. This resource also links to other garden related sites.

As the Internet and digital technology progresses, public gardens should progress with these changes. The future may see more use of the Internet for cataloguing a garden's collections. This may be accomplished through the use of DNA sequencing when the technology for this becomes more affordable and speedy to use. This would also decrease the potential for plants to be misidentified. Gardens may also find ways to represent their collections on-line by digitizing herbarium specimens. Gardens also may be able to tap into the potential of distance education

offerings many universities have by offering classes on-line. This would increase the potential audiences from the local community to a global one.

I recommend that in the future a study be conducted which looks at the Web site from the user's perspective. It would be interesting to interview garden visitors who use the Web site to determine the types of content they need and want. A similar study was recently published pertaining to museum Web site users (Kravchyna and Hastings, 2002). Since many virtual visitors may not be able to visit the garden, due to geography or other reasons, an on-line survey may uncover other needs of the virtual visitor. Additionally, a study could be conducted to explore e-commerce uses by public gardens and the success of these ventures.

I hope this thesis will encourage more institutions to become part of the World Wide Web and to create stronger Web presences. A Web site should be considered more than just a brochure like one found at the garden's visitor center; rather, it should contain information which can educate, inform, and entertain the visitor and make the visitor want to actually visit the institution. People are increasingly using the Internet to find information, especially travel-related information. A public garden that does not have a Web presence is potentially missing some of the visitors, volunteers, members, and the funding they may bring with them. The versatility of the Internet also allows gardens to effectively and inexpensively promote their missions and advertise their events and programs.

Appendix A

SURVEY COVER LETTER

Name
Attn: Garden Director
Address 1
City, ST ZIP

November 8, 2001

Dear Public Garden Professional,

I am a Fellow in the Longwood Graduate Program at the University of Delaware. I am currently conducting thesis research on public gardens that have Web sites to determine how these gardens are making use of Web technology. This survey focuses on Web development, maintenance, content, and analysis.

I would like your assistance with this research project through completion of the enclosed survey entitled "An Analysis of Public Garden Web Sites." Please direct this survey to the appropriate person at your institution. Please complete this survey at your earliest convenience and return in the enclosed envelope. If you have any questions about this survey, or the research in general, please feel free to contact me at 302-831-2517 or via e-mail at CTejral@longwoodgardens.org. I would appreciate any additional remarks your institution has about this project.

Thank you for your participation.

Sincerely yours,

Cindy S. Tejral
Longwood Graduate Fellow

Enclosures

Appendix B

AN ANALYSIS OF PUBLIC GARDEN WEB SITES

Longwood Graduate Program
C/O Cindy Tejral
University of Delaware
126 Townsend Hall
Newark, DE 19717-1303
320-831-2517

This questionnaire is being distributed to all Institutional Members of the American Association of Botanical Gardens and Arboreta in the United States with Web sites who charge admission fees. The Longwood Graduate Program is funding this research which focuses on identifying the efforts of public gardens in the United States in using Internet technology. The areas of specific interest are Web site development, maintenance, content, and analysis.

Please take a few minutes to respond to the questions presented in this questionnaire.

As required by regulations and ethics governing the conduct of survey research at the University of Delaware, your responses will be kept confidential. The following code identifies you only for data analysis and a survey response inventory:

When you have completed the questionnaire, please return it in the enclosed pre-paid, self-addressed envelope. Thank you for taking part in this research.

Would you like to the research results made available to your institution after the research is completed?

- ☐ Yes, please send me the results.
- ☐ No

PART A: Web Site Development

1. What is your institution's Web site address?

http://_____

2. What is the purpose of your institution's Web site? CHECK ALL THAT APPLY.

- ☐ Distribute information for visitors/tourists
 - ☐ Inform the public about institution's programs
 - ☐ Inform the public about institution's history
 - ☐ Inform the public about institution's mission
 - ☐ Increase number of volunteers
 - ☐ Increase number of members
 - ☐ Increase institution's on-site visitation
 - ☐ Increase institution's on-line visitation
 - ☐ Attract new audiences
 - ☐ Distribute information for school groups
 - ☐ Answer questions of potential visitors to reduce phone calls
 - ☐ Other (please specify)_____
- _____

3. Who is your Web site's target audience?

4. What are the goals of the Web site?

5. Do any of these goals tie in to your organization's mission?

- ☐ Yes
- ☐ No

6. Who was responsible for the creation of the Web site content? CHECK ALL THAT APPLY.

- | | |
|--|--|
| <input type="checkbox"/> Executive Director | <input type="checkbox"/> Office Assistant |
| <input type="checkbox"/> Marketing/Advertising
Manager/Department | <input type="checkbox"/> Intern |
| <input type="checkbox"/> Technology
Manager/Department | <input type="checkbox"/> Volunteer |
| <input type="checkbox"/> Horticulture
Manager/Department | <input type="checkbox"/> Outside Web Consultant |
| <input type="checkbox"/> Education Manager/Department | <input type="checkbox"/> Outside Design Consultant |
| | <input type="checkbox"/> Other (please specify)
_____ |

7. Who was responsible for the creation of the Web site design? CHECK ALL THAT APPLY.

- | | |
|--|--|
| <input type="checkbox"/> Executive Director | <input type="checkbox"/> Office Assistant |
| <input type="checkbox"/> Marketing/Advertising
Manager/Department | <input type="checkbox"/> Intern |
| <input type="checkbox"/> Technology
Manager/Department | <input type="checkbox"/> Volunteer |
| <input type="checkbox"/> Horticulture
Manager/Department | <input type="checkbox"/> Outside Web Consultant |
| <input type="checkbox"/> Education Manager/Department | <input type="checkbox"/> Outside Design Consultant |
| | <input type="checkbox"/> Other (please specify)
_____ |

8. Does your institution serve as its own Internet Service Provider/ISP (Do you maintain your own server computers where the Web site resides)?

- ☐ Yes
- ☐ No

9. For how many years has your institution's Web site been available to the public?

- | | |
|---|--|
| <input type="checkbox"/> Under one year | <input type="checkbox"/> 3 Years |
| <input type="checkbox"/> 1 Year | <input type="checkbox"/> 4 Years |
| <input type="checkbox"/> 2 Years | <input type="checkbox"/> 5 Years or longer |

10. How long was the Web site in the *planning and development process* before being made available on the Web?

- | | |
|--|---|
| <input type="checkbox"/> Under 1 month | <input type="checkbox"/> Between 13 - 18 months |
| <input type="checkbox"/> Between 1 - 3 months | <input type="checkbox"/> Between 19 - 24 months |
| <input type="checkbox"/> Between 4 - 6 months | <input type="checkbox"/> Over 24 months |
| <input type="checkbox"/> Between 7 - 12 months | |

11. How much did your institution spend in terms of *money to build the Web site* (do not include regular maintenance and information updates)?

- | | |
|---|--|
| <input type="checkbox"/> Under \$500 | <input type="checkbox"/> \$5,001 - \$10,000 |
| <input type="checkbox"/> \$500 - \$1000 | <input type="checkbox"/> \$10,001 - \$15,000 |
| <input type="checkbox"/> \$1001 - \$2000 | <input type="checkbox"/> \$15,001 - \$25,000 |
| <input type="checkbox"/> \$2001 - \$5,000 | <input type="checkbox"/> Over \$25,000 |

12. How many hours did your institution spend in terms of institutional staff time to build the Web site (do not include regular maintenance and information updates)?

- | | |
|---|---|
| <input type="checkbox"/> Less than 50 hours | <input type="checkbox"/> 501 - 700 hours |
| <input type="checkbox"/> 51 - 100 hours | <input type="checkbox"/> 701 - 1000 hours |
| <input type="checkbox"/> 101 - 300 hours | <input type="checkbox"/> Over 1000 hours |
| <input type="checkbox"/> 301 - 500 hours | |

Part B: Web Site Maintenance

13. Who does your institution's Web site maintenance and information updates?
CHECK ALL THAT APPLY.

- ☐ Executive Director
- ☐ Marketing/Advertising Manager/Department
- ☐ Technology Manager/Department
- ☐ Horticulture Manager/Department
- ☐ Education Manager/Department
- ☐ Intern
- ☐ Volunteer
- ☐ Outside Web Consultant
- ☐ Outside Design Consultant
- ☐ Other (please specify) _____

14. Are updates made to your institution's Web site?

- ☐ Yes
- ☐ No – [Skip to question 18]

15. How often is your institution's Web site updated?

- | | |
|--|---|
| <input type="checkbox"/> Daily | <input type="checkbox"/> Seasonally |
| <input type="checkbox"/> Once a Week | <input type="checkbox"/> Bi-Yearly |
| <input type="checkbox"/> Every Two Weeks | <input type="checkbox"/> Yearly |
| <input type="checkbox"/> Monthly | <input type="checkbox"/> Less than Yearly |

16. Is information that is new or updated identified for the user?

- ☐ Yes
- ☐ No – [Skip to question 18]

17. How is the new or updated information identified?

18. What is the total annual cost of site maintenance? Include hosting fees, staff time, and consultant fees.

- | | |
|--|---|
| <input type="checkbox"/> Less than \$500 | <input type="checkbox"/> \$5001 - \$10,000 |
| <input type="checkbox"/> \$501 - \$1000 | <input type="checkbox"/> \$10,001 - \$ 25,000 |
| <input type="checkbox"/> \$1001 - \$2000 | <input type="checkbox"/> \$25,001 - \$50,000 |
| <input type="checkbox"/> \$2001 - \$3000 | <input type="checkbox"/> \$50,001 - \$100,000 |
| <input type="checkbox"/> \$3001 - \$5000 | <input type="checkbox"/> Over \$100,000 |

PART C: Web Site Content

19. Is your institution's Web site, or portions thereof, available in languages other than English?

- ☐ No
 - ☐ Yes; Please List Languages
-

20. Are plug-ins necessary to view content on your institution's Web site?

- ☐ No [Skip to question 24]
- ☐ Yes

21. What plug-ins are necessary to view content on your institution's Web site?
CHECK ALL THAT APPLY.

- | | |
|--|---|
| <input type="checkbox"/> Adobe Acrobat | <input type="checkbox"/> Quick Time |
| <input type="checkbox"/> Real Player | <input type="checkbox"/> Other (Please list): |
| <input type="checkbox"/> Liquid Audio | _____ |
| <input type="checkbox"/> Shockwave | |

22. If Plug-ins are used, is the content available in a non-plug-in format as well?

- ☐ Yes
- ☐ No

23. Do you provide links from your site to download any necessary plug-ins?

- ☐ Yes
- ☐ No

24. What opportunities has the Web site created for interaction with the site's users?
CHECK ALL THAT APPLY

- | | |
|---|--|
| <input type="checkbox"/> On-line guest books | <input type="checkbox"/> Interactive Games |
| <input type="checkbox"/> Chat Rooms | <input type="checkbox"/> Video Clips |
| <input type="checkbox"/> Option to Register | <input type="checkbox"/> Live Cams |
| <input type="checkbox"/> Discussion Lists | <input type="checkbox"/> Survey |
| <input type="checkbox"/> Other (please specify) _____ | |

25. Does your institution's Web site provide links to other Web sites?

- ☐ Yes
- ☐ No [Skip to Question 27]

26. How have links outside of your institution's site been chosen?

27. Have there been collaborative efforts made with linking your institution to other institutions in your city or region? (ie. link to museums or historical sites)

☐ No

☐ Yes (please specify): _____

PART D: Web Site Analysis and Testing

28. Has the Web site been analyzed or tested to determine usability?

☐ Yes

☐ No – [Skip to Question 31]

29. What systems of analysis have been used to determine Web site usability?
CHECK ALL THAT APPLY.

☐ Focus Groups

☐ Interviews

☐ Log data analysis

☐ Other (please specify) _____

30. What *information was learned* from the analysis that your institution completed?

31. Is Web log data collected from your institution's Web site (number of pages viewed per visitor session, where visitors are located, etc.)

☐ Yes

☐ No [Skip to Question 33]

32. How has web log data been used to *make improvements* to the site's content or navigation systems?

33. By what methods is your Web site marketed? CHECK ALL THAT APPLY.

- ☐ Included on institutions print material (brochures, newsletters, etc.)
- ☐ Included in non-institutional print advertising (newspaper, magazines, etc.)
- ☐ Used in television and radio advertising for institution
- ☐ On-line through search engine registration
- ☐ On-line through links from other institutions
- ☐ Other (please specify) _____

PART E: Institutional Information

34-38. Provide the number of staff at your institution and their breakdown.

34.	Total Employees	
35.	Full Time Employees	
36.	Part Time Employees	
37.	Students/Interns	
38.	Volunteers	

39. Select the best answer to describe the *annual operating budget* of your institution.

- ☐ Less than \$200,000
- ☐ \$200,001 - \$500,000
- ☐ \$500,001 - \$1,000,000
- ☐ \$1,000,001 - \$2,000,000
- ☐ \$2,000,001 - \$4,000,000
- ☐ Over \$4,000,000

40. Select the best answer to describe *your job title* at this institution.

- ☐ Executive Director
- ☐ Marketing Department head/manager
- ☐ Technology Department head/manager
- ☐ Education Department head/manager
- ☐ Other (please list) _____

41-46. Please provide your institution's *visitation statistics* since 1995.
If none available, please note **NA**.

41. 2000 - _____

42. 1999 - _____

43. 1998 - _____

44. 1997 - _____

45. 1996 - _____

46. 1995 - _____

47-53. Please provide your institution's *Web site visitation statistics* since 1995.
If none available, please note **NA**.

47. 2000 - _____

48. 1999 - _____

49. 1998 - _____

50. 1997 - _____

51. 1996 - _____

52. 1995 - _____

54. What do these numbers in Questions 47-53 represent?

☐ Page Views

☐ Sessions

☐ Hits

☐ Other: _____

Appendix C

INTERNET RESOURCES

The resources listed and discussed below are meant as guides to different topics in Web design. As there are multiple Web sites for many of these topics, this list is not complete, but is a sample of the informative and useful sites available on-line as of this writing.

Accessibility

Bobby – <http://www.cast.org/bobby/> - This is a free service which analyzes Web pages and suggests methods of improving accessibility.

Electronic and Information Technology Accessibility Standards –

<http://www.access-board.gov/sec508/508standards.htm> - This is the United States government's rules and explanations of Section 508 of the Rehabilitation Act Amendments which creates accessibility standards for electronic and information technology in federal agencies.

Wave 2.01 – http://www.temple.edu/inst_disabilities/piat/wave/ - This service, through Pennsylvania's Initiative on Assistive Technology (PIAT), will check

Web sites for accessibility including Section 508 and flag items which are potential problems.

Web Garage – <http://websitegarage.netscape.com> – This site provides services for maintaining and improving a Web site.

World Wide Web Consortium – <http://www.w3.org> – This site contains information about accessibility issues and reports on other Web design issues.

Design

Cool Home Pages – <http://www.coolhomepages.com> – This site shows examples of different Web sites under categories such as animation, rollovers, travel, and usability.

Vincent Flanders' Web Pages that Suck – <http://www.webpagesthatsuck.com> – This site provides examples of bad design to help learn good design techniques.

Webmonkey – <http://www.webmonkey.com> – This site provides articles, tutorials and product reviews.

Internet Service Providers

HostSearch – <http://www.hostsearch.com> – This site can help you find an Internet Service Provider and is searchable based on price and needs.

The List – <http://thelist.internet.com> – This site allows searches for Internet Service Providers by location as well as many Internet resources.

Interactivity Software

Internet Pictures Corporation – <http://www.ipix.com> – This site provides information on the use of iPIX for developing 360-degree images.

Macromedia – <http://www.macromedia.com> – This site provides information about Flash, Shockwave, and other Macromedia programs.

Adobe – <http://www.adobe.com> – This site provides the download for Adobe Acrobat reader and has links to products within the Acrobat company and other resources.

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