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A Review of Selected E-Recruiting Websites: Disability Accessibility Considerations

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Abstract

Ten job boards[1] and 31 corporate E-recruiting websites were evaluated for accessibility for people with disabilities. The examination was performed using both an automated accessibility testing software (Bobby v3.2) and an examination of a sub-sample of the sites through a "simulated" application process. The simulated application process was performed utilizing only the information available to a screen reader and navigating the site using only keyboard commands, duplicating how a blind individual would typically navigate the web. The purpose of this second method was to see if it would be possible to successfully proceed through the entire multi-step job search and application process.

None of the job board pages (home, job search, signup, or resumé submittal pages) evaluated by Bobby were found to be accessible. The vast majority of corporate E-recruiting sites also failed Bobby's tests. The simulated application process evaluation was slightly more promising, but still only three of the nine job boards and three of the twelve corporate sites evaluated were accessible enough to work through the entire process of registration, job searching, resumé submittal, and application for a position. Many of the issues encountered could easily be corrected through the consistent use of alternative text for essential submit image buttons (i.e. "apply," "post resumé").

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[1] Job board: an Internet site where employers pay to post their positions and to search the resume database for candidates. Candidates can search and apply online for positions as well as post resumes for free.

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Introduction

The use of the Web for business purposes has been rapidly expanding over the past several years. One of the areas of the greatest growth is E-recruiting, which nearly all (91%) Fortune 500[2] businesses have embraced, according to an iLogos Research survey (2002). The purpose of the research described in this report was to examine the accessibility of E-recruiting for people with disabilities. Accessibility of both job boards (where employers pay to post their positions and to search the resumé database for candidates), and large corporate career websites (where an individual applies directly on a corporation's careers website) were examined.

Background

With the millions of jobs and resumés available online, "The Internet has become the most effective way to broadly disseminate information about the availability of jobs and people" (How online recruiting changes the hiring game, 2001). Bruce Hatz, a corporate staffing

[2] The Fortune 500 group of companies is comprised of the 500 largest companies in the U.S., based on gross revenue, compiled by Fortune Magazine (http://www.fortune.com)

manager at Hewlett-Packard, states "It's dramatically more effective than any medium ever known. The Web is the future of recruiting" (Useem, 1999, p. 97). Indeed, research by Goldman Sachs showed that between the beginning of 1999 and November 2000, traffic to career-oriented websites had more than doubled, to 12.3 million unique visitors per day (Rosenwald, 2000).

A January 2001 poll by the Society for Human Resource Management (Society for Human Resource Management, 2001) found HR managers made heavy use of Web recruiting, with 88% of the managers surveyed reporting using Internet job postings, just slightly behind the proportion using personal contact/networking (95%), newspaper advertisements (96%) and employee referrals (91%). Internet job postings came in ahead of headhunters (74%), employment agencies (76%), and advertisements in professional and trade journals (67%). The majority (58%) of the respondents said that Internet job postings were an effective or extremely effective search technique, just slightly less effective than the highest rated "personal contact/networking" (61%).

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> *"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."*
>
> —*Tim Berners-Lee, W3C Director and inventor of the World Wide Web*

The recruiting process is the gateway to employment. E-recruiting is having an enormous impact on businesses, even as accessibility of Web sites is a continuing concern. To explore these interrelated issues, Cornell University conducted an assessment of E-recruiting sites' accessibility as a part of its research on disability non-discrimination in employer practice. This paper presents our findings.

E-recruiting has the potential to revolutionize the job search and application process for individuals with disabilities. It makes it possible to easily browse job listings and submit resumes from home or from publicly accessible locations such as libraries. However, this requires that Web recruiting sites themselves not present accessibility problems. Inaccessible E-recruiting sites could present a new technological barrier to employment, preventing people with certain disabilities from finding and applying for available positions.

What types of disabilities might cause difficulties in using the Web and what are those potential difficulties? The following is a list from the World Wide Web Consortium (W3C), whose mission focuses on making the Web more accessible, describing some of the barriers the Internet can present to people with different kinds of disabilities (Brewer, 2001, p.5):

Visual disabilities:
- unlabeled graphics, undescribed video
- poorly marked-up tables or frames
- lack of keyboard support or screen reader compatibility

Hearing disabilities:
- lack of captioning for audio
- proliferation of text without visual signposts[3]

Physical disabilities:
- lack of keyboard or single-switch support for menu commands

Cognitive or neurological disabilities:
- lack of consistent navigation structure
- overly complex presentation or language
- lack of illustrative non-text materials
- flickering or strobing designs on pages

Only one study has examined the accessibility of Web recruiting sites (Jackson-Sanborn, Odess-Harnish and Warren, 2001). They examined the 50-100 most visited websites in six categories: overall most-visited, clothing, international, jobs, college, and a random sample of 295 government sites. An automatic Web accessibility evaluation tool, Bobby v3.2, was used to evaluate the first layer of each of these sites. The results only discussed Bobby's most basic priority one level errors, "show stoppers" that could prevent individuals with various disabilities from being able to access information on the site. Most of the categories performed poorly. Overall, two thirds (66%) of the websites evaluated failed Bobby's most basic accessibility priority one error tests. They found that four out of five (81%) of the job sites were found to be not accessible according to Bobby's priority one criteria. Additionally, only 6% of the sites passed Bobby's more stringent user checks level—areas that may create accessibility problems that require manual evaluation. It is important to note that this study did not follow-up to determine if these user checks actually made the site inaccessible.

Since finding and applying for a position online is a multi-step process, this study expands upon this research and moves beyond simply performing an automated evaluation of home pages. If the home page is accessible but the search page or application pages are not, then the user hits a brick wall in the process. This research examines essential pages required to actually register at a site, search for open positions, and submit an application at the ten most popular job boards as well as 31 corporate recruiting sites.

Methods

Sample Selection

Forty-one websites were evaluated in all, 31 corporate E-recruiting websites and ten job boards. The ten job boards were selected on the basis of those with the greatest traffic—defined as the largest number of unique visitors in the month of January 2001 according to Neilsen/

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[3] For deaf users whose primary language is sign language with no written equivalent, a large amount of text can present a barrier.

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Netratings (White, 2001). The list of sites evaluated is noted on page 26. All evaluations took place in January and February of 2002.

The 31 corporate recruitment sites selected for the accessibility review were derived from two sources. Cambria Consulting, a Boston based Human Resources consulting firm, selected 140 companies from Fortune Magazines list of America's "Best Companies to Work for" and "Most Admired Companies" (Densford, 2000). They then examined their E-recruiting websites and rated them on their "overall usefulness to employer" (up to five stars) and "overall ease of use" (up to five stars) for applicants. The most effective sites, 14 in all, were awarded 10 stars and were included in our accessibility testing (see page 26). The following summarizes some of the "user friendly" features Cambria Consulting found on the recruiting sites:

- Easy site navigation and links to career pages for candidates

- Categories such as location, job function, and key-word search to help candidates identify appropriate positions

- Attractive and easy to read graphics

- Candidates can easily paste resumes to application page, e-mail them, or create online applications for specific job openings

- Self-assessment quizzes asking candidates about their interests and experience to direct them to appropriate openings

- Access to company information and "culture" as well as profiles of archetypal employees to give a sense of what working for the company would be like

The remaining corporate sites were selected from the list of the top Fortune 500 companies. If any of these companies was already included in the previous "most effective recruiting site" sample, the next Fortune 500 company on the list was selected.

These two samples allowed us to examine what was independently determined as the "best of corporate E-recruiting sites" along with other major corporate sites with fewer "bells and whistles." It was hypothesized that the 14 most effective recruiting sites might tend to be less accessible through the use of fancier and more complex web design than the Fortune 500 companies.

The sites selected for the process evaluation included nine of the ten job boards (Jobs.com was undergoing reorganization at the time) as well as six of the Top 14 Web recruiter sites and six of the Fortune 500 company sites. These sites were selected to cover the range of performance as determined by Bobby's accessibility evaluation to attempt to examine their "real world" performance.

Evaluation Software Selected for Site Review

Following the lead of several other accessibility studies (Jackson-Sanborn, 2001; Odess-Harnish and Warren, 2001; Rowland and Smith, 1999; Rowland, 2000; Sams and Yates-Mercer, 2000; Schmetzke, 2001), Bobby 3.2[4] was the primary evaluation software utilized. Bobby was developed by the Center for Applied Special Technology (CAST), a non-profit entity, and is designed to analyze accessibility based on the World Wide Web Consortium's (W3C) Web Accessibility Initiative (WAI) Web Content Accessibility Guidelines. It is designed to check for accessibility errors and a report is generated listing the type, number and the location where the error was detected. Bobby evaluates sites according to three priority levels for accessibility errors. "Priority one" level errors are the ones that determine if the site achieves the "Bobby approved" status and this was the level/criteria used in this study. These errors are "show stoppers" that would make it impossible for one or more groups to access the information contained on the page. Since Bobby cannot automatically check every W3C-WAI guideline, it also lists "user checks" to be manually examined if triggered by a specific attribute on a page. A site can receive the "Bobby approved" icon only if does not contain any "priority one" errors and passes all the level one "user checks." Due to the large number of pages evaluated in this study, these user checks were noted but not checked.

Bobby has several limitations as noted by Schmetzke (2001). Bobby is not able to test the accessibility of script (i.e. Javascript) or content created by scripts. When Bobby encounters images it checks to see if there is alternative text (typically referred to as alt text) associated with it. If there is alt text associated it will pass that image; however, it cannot determine if the alt text will provide adequate information to successfully navigate the page and understand its contents. For example, a page may indicate a field which is required to be completed by a user with a picture of a star. The alt text "star" is descriptive of the image, but does not clarify that the star's purpose is to identify required information. Bobby is also unable to evaluate pages that require the user to register or log in, which limited its usefulness in certain types of pages examined in this study, specifically resumé submittal pages.

It is important to note that even when Bobby detects an error it does not necessarily mean the site is completely inaccessible. Bobby has no way of determining the importance or insignificance of the errors it detects. For example, it may detect missing alt text on a page for an image that is only an advertisement or a background.

[4] Since this study was performed Bobby has been purchased by Watchfire (http://bobby.watchfire.com/bobby/html/en/).

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Bobby will note it as an error and flag the site as inaccessible, despite the fact that a particular error may not have any impact on the actual purpose of the page. Despite these issues Bobby is still the most often used tool to evaluate a large number of sites for accessibility and gives a useful and stringent test for overall accessibility.

Due to the issues of Bobby evaluations noted above, all of the job boards and six sites from each of the two corporate categories of sites were further evaluated manually. This evaluation was performed with two computers, both running under the Windows 2000 operating system. Pages were loaded with Microsoft Internet Explorer, version 5.5.

Another accessibility testing tool, WAVE version 2.01, was used to supplement Bobby's evaluations. WAVE performs similar checks, but has the advantage of being able to evaluate certain sites that Bobby is unable to access. WAVE was developed by Pennsylvania's Initiative on Assistive Technology (PIAT) based at Temple University.[5]

Two screen readers were used in conjunction with the simulated application process: Windows Narrator and JAWS. Narrator is a very basic screen reader installed as part of the Microsoft Windows 2000 operating system designed to assist with computer setup or use other people's computers. Although it is not nearly as functional as the commercial screen readers, it was thought that this "free" reader might be the only affordable option for unemployed individuals searching for work. JAWS version 4.0 (Job Access with Speech) is a much more sophisticated screen reader and is the most popular reader used by blind or low vision computer users (http://www.FreedomScientific.com). Narrator and JAWS were used to evaluate situations which appeared to be potentially problematic to screen readers.

The Evaluation Process
The simulated application process was performed following a portion of the W3C's recommended preliminary review for evaluating sites for accessibility. The purpose of this simulated application process was to see if it was actually possible to search and apply for a job given the potentially more challenging scenario of an individual using a screen reader with limited hand dexterity that prevented the use of a mouse. One computer was running Microsoft Internet Explorer with images and sound turned off, and navigation limited to the key-

board only. Another computer was set up alongside the first, but running a fully functional version of Internet Explorer to determine what was lost in the dropping of images and to clarify problematic navigation issues. Inaccessible links and images not required for the purpose of performing a job search and the application process were ignored in this evaluation, although links that were deemed potentially useful for these purposes (i.e. help pages) that were inaccessible were also noted.

Four web pages were chosen for evaluation on each site. The pages selected were those most likely to be encountered and navigated by a person looking and applying for a job. The corporate site pages evaluated included the home pages of each site, the corporate careers page, job search or job postings page, and finally the resumé submission front page (when available). The job board pages selected for evaluation were similar, and included the following components: the home page, job search/postings page, and the first page for resumé submission. As most job boards required signing up/registering for their service before a resumé could be submitted, the job board registration page was also evaluated for accessibility. Both the process and the Bobby evaluations were performed in the first quarter of 2002.

Job Board Results

Bobby Evaluation
None of the ten job board home pages passed Bobby's priority one evaluation (see Table 1 on page 7), with all containing at least one priority one type error.[6] Bobby therefore deemed them all inaccessible. When the job search pages of the job boards were tested by Bobby, none were determined to be accessible. The same was found for the sign up/registration pages of the job boards with all showing Bobby priority one errors. Due to most sites requiring registration before allowing access to their resumé builder/submittal page, Bobby was only able to evaluate two of the job board's resumé pages. Neither of the two resumé pages which Bobby was able to evaluate received Bobby approval, with both having at least three priority one errors.

The most common error was the lack of alternative text (alt text) for images, which Bobby detected on nearly all of the pages (80-100 percent of each page type evaluated) in all ten job board sites. Alternative text is a text description that screen readers can read to identify images for those with visual problems (see the Visual Glossary on page 9 for examples). The number of these errors on a single page ranged from a low of four to as many as 272 on a single home page (average of 78).

Some of these are non-essential images or backgrounds, but they frequently include essential links, or an important title for a list of links. In the case of image-links without this descriptive text, a user with a screen reader would only have a link address (often cryptic) to figure out where it leads. While labeling images is important, some images such as spacers and backrounds are non-essential to either navigation or comprehension. These images should be given the null alt-text (<IMG src = "filename" alt = "" />) so that a screen reader user does not have to wade through a host of unnecessary image descriptions to get to the content of the site.

The next most common error detected was not providing alternative text for image-type buttons in forms. This is particularly prevalent and problematic with six of the ten registration pages and three of the ten job search pages. In order to register with a job board or submit a search, a button that is an image (often labeled "submit") must be "pressed." If these buttons are not identified with alt text, the user has no way of registering with the job board (and therefore applying for any of the positions posted on the board) or any way to find out the results of a search—the Web equivalent of hitting a brick wall. This situation was also found in one of the two resumé submittal pages that Bobby was able to evaluate—again another job application "brick wall" for an individual using a screen reader.

Other errors Bobby detected included two sites using frames[7] that did not label the frames, and two others that did not provide alternative text for image map "hot-spots."[8]

Evaluation of Job Board Application Process

Only nine of the ten job boards underwent this evaluation, as Jobs.com was undergoing reorganization at the time of this analysis and the site was not available. As can be seen in Table 2 on page 10, all the home pages of the job boards contained accessible links to the essential pages examined: signup/login/registration, resumé builder, and the job search page. One site's home page link to the job search was an image map link without alt text, but it was possible to access the job search page via the site map page (which was accessible from the home page).

When a basic screen reader such as "Narrator" encounters a link missing alt text it will just read "link"

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[7] Frames may be used to organize the information on a page. Frame labels can assist a screen reader user to understand this organization and simplify page navigation.

[8] Some larger images may contain multiple links, called "hot spots," within the image. Each "hot-spot" should have alt text for the link to be accessible.

Table 1:
Job Boards, Bobby Priority One Test Results

	Home Pages	Sign up page	Job Search	Resumé Builder
Number of sites Bobby evaluated	n=10	n=10	n=10	n=2
% Accessible (no priority one errors detected)	0%	0%	0%	0/2
Accessibility errors noted				
Provide alternative text for all image-type buttons in forms	40%	60%	30%	1/2
Provide alternative text for all images	100%	90%	80%	2/2
Give each frame a title	20%	30%	20%	2/2
Provide alternative text for all image map hot-spots	20%	20%	20%	1/2
Each frame must reference an HTML file	10%	20%	10%	1/2

—clearly a dead end. More sophisticated screen readers (i.e. JAWS) will read the link address if there is no alt text. However, this information is not always useful depending on the actual link address. One example of an unlabeled "job agent" (which e-mails a user of new job postings that fit their search criteria): link address "http://jobcast.jobboard.com/texis/ja/%2Bnww_qt5wcwGO/new.html','commonwindow','720',%20'650"—not very helpful or explanatory of where that link leads.

Only four of the nine job boards had accessible signup/login pages. Most of the inaccessible pages were passable until the critical "submit" stage where five of the sites used image buttons without identifying alt text.

As with links without alt text, one site's registration submit button is read by the JAWS screen reader as: "btn_submit_org.gif." A screen reader user might be able to deduce the button's purpose, but would be much simpler if it had alt text attached "click to submit your registration information."

One board also utilized a problematic auto-submit combo box that allows a mouse-using applicant to select one of 67 job categories (see Figure 1). Unfortunately, if you attempt to navigate the list with the standard method using the arrow keys, only accountants can progress further, as that is the first item and automatically chosen. Successful navigation is possible using Internet Explorer, but requires the use of a non-intuitive and undocumented key combination ("alt-down arrow"). This disables the auto-submit, allowing the user to browse

through the list and make a selection. As there is no way for a user to differentiate between a standard combo box and an auto-submit combo box, a user would probably accidentally trigger the auto-submit, be sent to the wrong page, and have to return to the original page to use this key combination and make a selection. The key combination workaround is not available in Netscape.

An additional issue was found with one job board. Whenever a user clicked on a link or submitted information the site would throw up at least one, if not two or three, additional "popup" windows from their advertisers. This is annoying to sighted users but far more disruptive to users of screen readers who now are faced with several new unanticipated windows in front of the page they were expecting.

Three of the job search pages were inaccessible—most because of the simple oversight of not including alt text for the submit search buttons (see Figure 2 on page 11). In addition, one site utilizes a completely inaccessible image map of the United States to select job locations, due to the lack of alt text (see Figure 3 on page 12). Once a job is identified, three sites did not have alt text for their "apply" image button (for an example, see Figure 4 on page 13). Of the eight sites that had a resumé builder page, half were inaccessible, once again most often due to the lack of alt text on the image buttons for "continue" or "submit" (for an example, see Figure 5 on page 14).

Overall, only a third of the nine job boards were accessible through the entire process using information available to a screen reader and navigating with keyboard commands. In fully a third of all the job board pages examined the primary issue was the simple lack of alt text for a critical image button required to submit information.

## Examples of Web Recruiting Accessibility Issues
Pages 11 to 14 provide representations of various job board pages illustrating some of problems and solutions found in the examination of the sites around Web accessibility issues, followed by a summary table. Each example provides two images: the upper image is what is visible with a fully operational Microsoft Internet Explorer browser. The lower image is the same page, but with images turned off and alternative text showing (where it has been implemented). What text is visible on the page in this mode is the information a screen reader has available to read. Images without alternative text show up as an empty box with an image icon inside. Although these pictures do not comprehensively show all the Web access issues on a particular page, they do illustrate and highlight some of the major issues encountered by an individual with a visual disability using a screen reader.

The most common issues encountered on the pages include:
- Critical submit buttons lacking alternative text (alt text)
- Critical links lacking alternative text
- Image maps lacking alternative text
- Combo-boxes designed to "auto submit on change"
- Form tables with inadequate labels for columns and rows

Figure 1: Job Board Auto-Submit Combo Box
Only the accounting category is available using documented keyboard commands.

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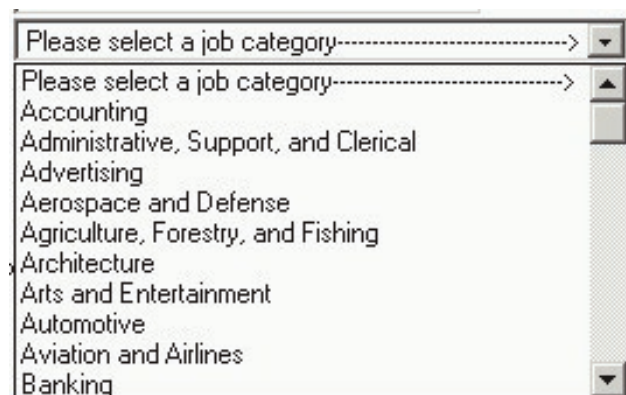
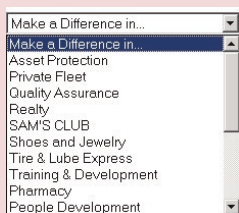## Visual Glossary of Basic Screen Reader Web Accessibility Issues Encountered

Search Jobs

This is an image without alternative text. Images can be anything from photographs, to icons, to an image of text as in these examples. A screen reader will ignore it if it is just an image and has no alt text. If it has alt text the text will be read. If it is a link without alt text, basic screen readers will note it simply as "link." More sophisticated screen readers will read the address of the link itself. Addresses can be quite cryptic as is this one whose photograph of an employee links to a description of her experience working for the company: http://www.careers.com/images/portrait3_On.jpg.

Find a Job   Post Resume   Broadcast Resume   Job Alerts

This is an image map with "hot spots": This is a single larger image that has four areas (hot spots) within it "mapped" to link to other pages on the site. Each of these "hot spots" needs alt text for successful navigation using a screen reader.

Search ▶   Search

This is a typical "submit" button image. As with other images, if a button lacks alternative text it is impossible for a screen reader to determine what the button's purpose is. The second image is what is displayed when images are turned off in the Web browser—a blank box containing an image icon. The third image illustrates how the button would appear if it had associated alt text of "Search."

Make a Difference in...
Make a Difference in...
Asset Protection
Private Fleet
Quality Assurance
Realty
SAM'S CLUB
Shoes and Jewelry
Tire & Lube Express
Training & Development
Pharmacy
People Development

This is a "combo box" which provides a listing of alternate choices. On recruitment sites these are often used to select a job type or location. Combo boxes are typically not problematic for keyboard navigation (a user can tab to the box and use the arrow keys to select their choice). However, on some Web pages these combo boxes are designed to "auto-submit upon change." This means as soon as an item is selected the user is sent to that selection. For a mouse user this is not an issue as they can scroll through the list then make their selection. However this "auto-submit feature" makes keyboard navigation through the list problematic as it sends the user off to that page—without giving the screen reader/user an opportunity to read/hear the other choices.
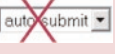
Previous Experience
Please enter previous Job Titles and Employer Information. Most recent employment first.

Title	Employer	From Date	To Date

This is a form table from a resumé submittal page. The way it is designed results in a screen reader reading the headers across the top (Title, Employer, From Date, To Date) and then "enter" 16 times (once for each text field)—making it very difficult if not impossible to determine what information is needed for that particular field. Most resumé submittal pages avoided this problem by separating each position out rather than using this table type design.

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Table 2: Summary of Simulated Application Process: Job Boards
Screen reader/keyboard navigation barriers encountered

Job Boards	Home page	Signup/Login	Resumé builder	Search Page	Search Results	Other
Job Board 1	✓	[Alt Text ✗]	[Alt Text ✗]	✓	✓	
Job Board 2	✓	✓	✓	✓	✓	"premium" service inaccessible
Job Board 3	✓	[Alt Text ✗]	[Alt Text ✗]	[Alt Text ✗]	[Alt Text ✗]	Generates many popup windows
Job Board 4	✓	✓	NA	✓	✓	
Job Board 5	✓	[Alt Text ✗]	✓	✓	✓	Only lacks alt text for 1 signup submit button
Job Board 6	✓ *	[Alt Text ✗] [auto submit ✗]	[Alt Text image ✗] [Alt Text ✗]	[Alt Text ✗]	✓	*Home page image map link to job search page inaccessible (must use sitemap)
Job Board 7	✓	[Alt Text ✗]	[Alt Text ✗]	[Alt Text ✗] [Alt Text image ✗] [frames ✗]	[Alt Text ✗]	
Job Board 8	✓	✓	✓	✓	✓ *	* Results page e-mail & add to clip-board submit buttons inaccessible, apply button OK
Job Board 9	✓	✓	✓	✓	[Alt Text ✗]	
Overall	9/9 ✓	4/9 ✓	4/9 ✓	6/9 ✓	6/9 ✓	

✓ Minimally accessible: basic information and links are accessible via screen reader and keyboard (Note: other links and buttons may lack alt text and other accessibility issues may still exist)

[Alt Text ✗] Essential submit button image missing alternative text (i.e. search, go, continue, submit)

[Alt Text image ✗] Essential image link missing alternative text

[auto submit ✗] "Combo box" menu automatically submits on change not keyboard accessible—item is submitted as soon as item is selected (impossible to get beyond first item in menu)

[table ✗] Inadequately labeled tables

[frames ✗] Frames issue—can't access essential areas of page with keyboard

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Figure 2: Job Board Job Search page

- "Search Jobs" Image Button inaccessible (no alt text)
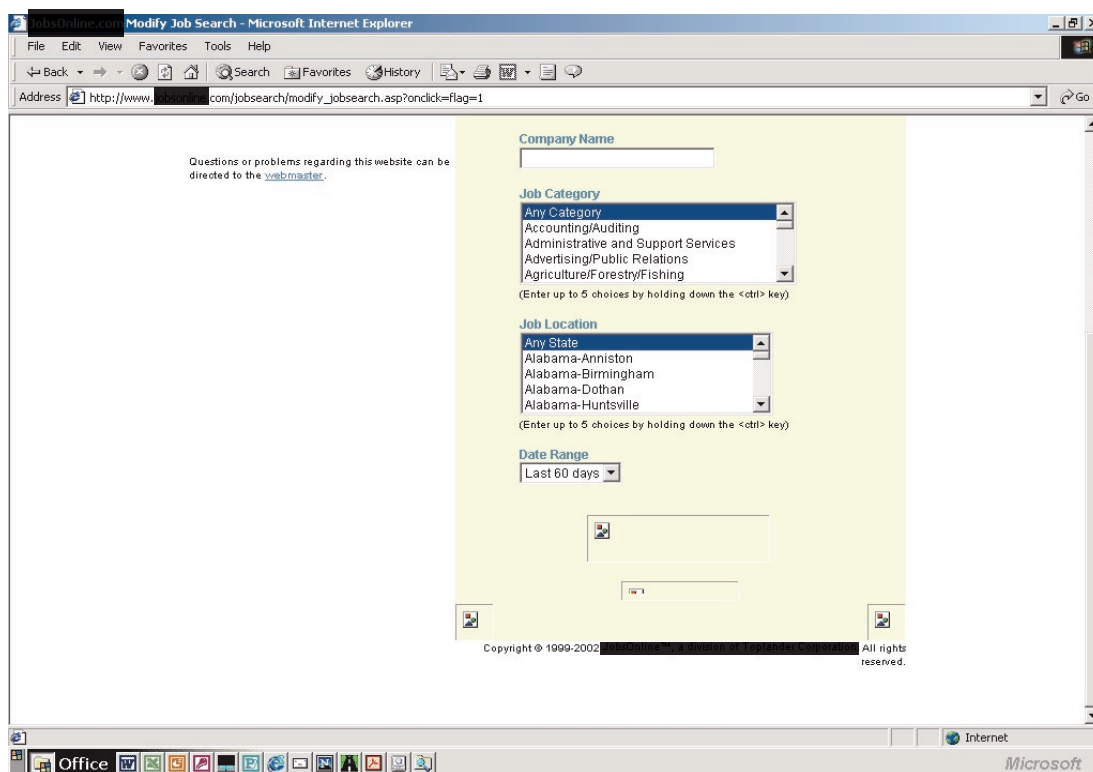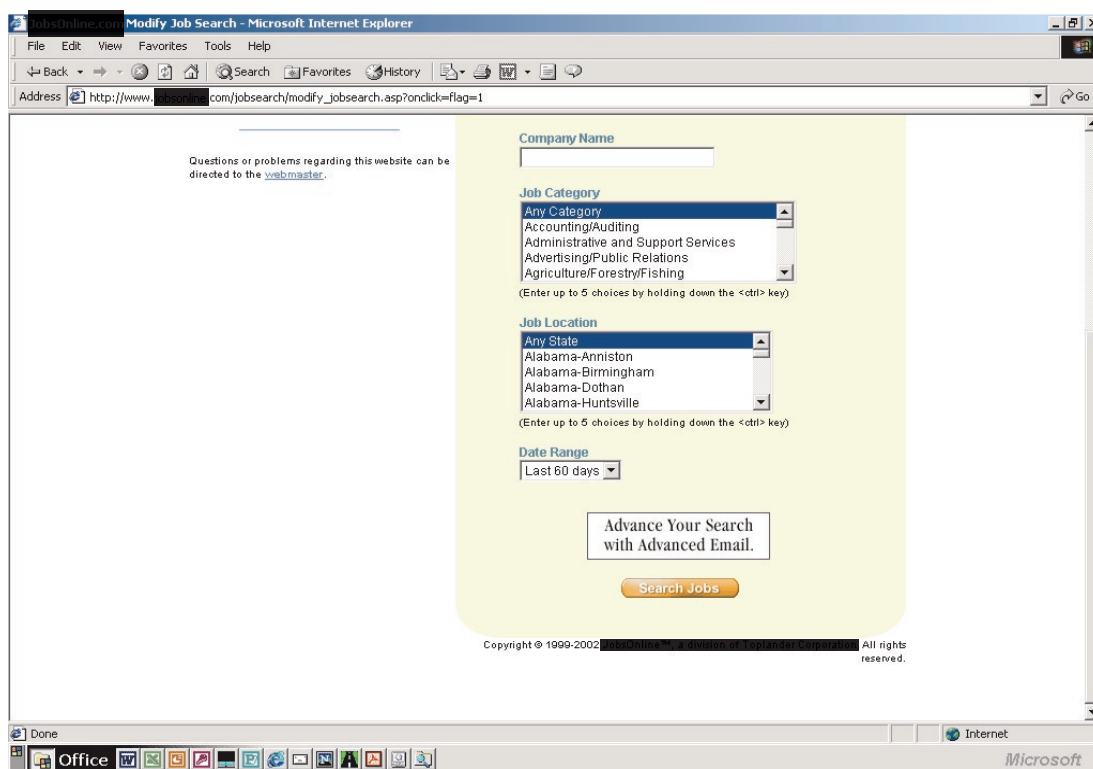
Figure 3: Job Board Search Page

This is the first step of a job search for one job board.

- "Steps 1-3" are images without identifying alt text.

- The U.S. map is an "image map" where a mouse click in different regions selects the state. A screen reader reads "Javascript:windowfocus()imagemap link" for each of the 50+ locations on the map—completely inaccessible.

- If the user is sighted but cannot use a mouse it is possible to use the keyboard to "tab through" the map. However the order in which the images are tabbed through has no apparent logic. It skips from Washington D.C. to Alaska, Hawaii, Montana, Minnesota, Massachusetts, Nevada, Pennsylvania . . . not very user friendly.

- Frames issue: if a state is selected, a list of cities in that state is presented, but the list is not accessible via the keyboard nor are the "next" and "finish" buttons.

- The "previous" "next" and "finish" submit buttons are image buttons lacking alt text.
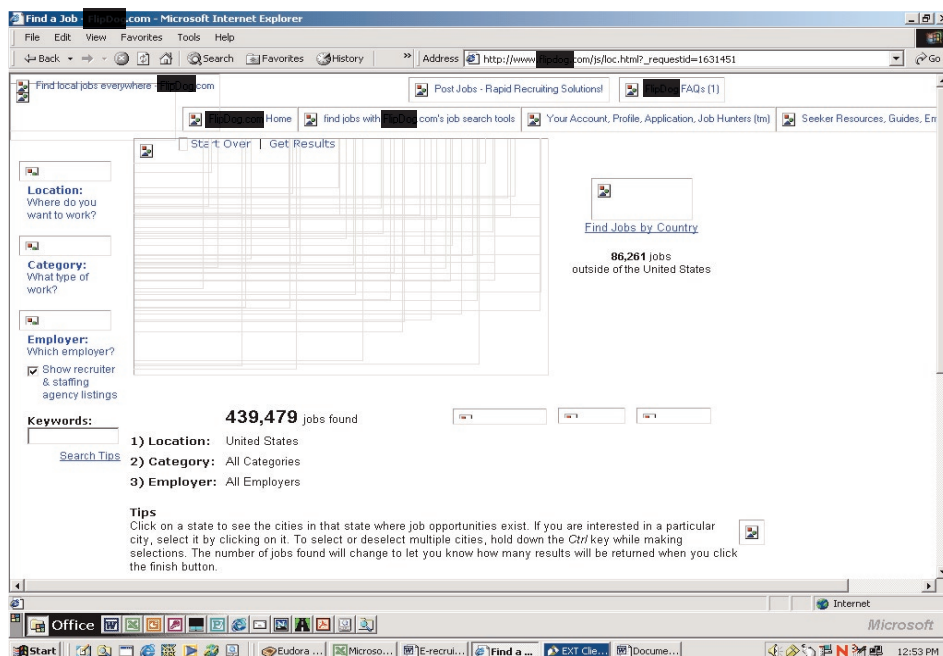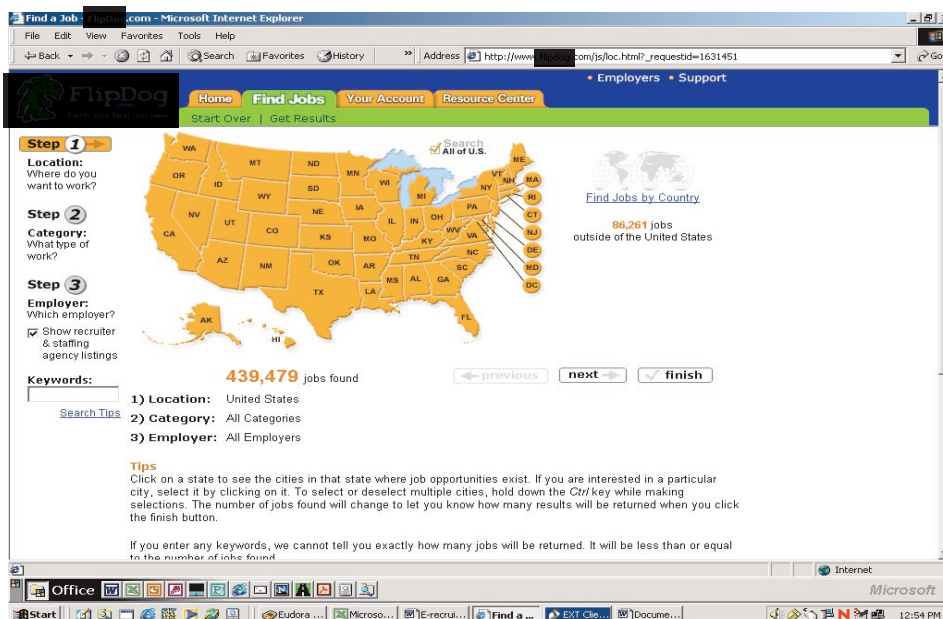
Figure 4: Job Board Job Search Results Page

Note the lack of alt text identifying the essential submit image buttons:
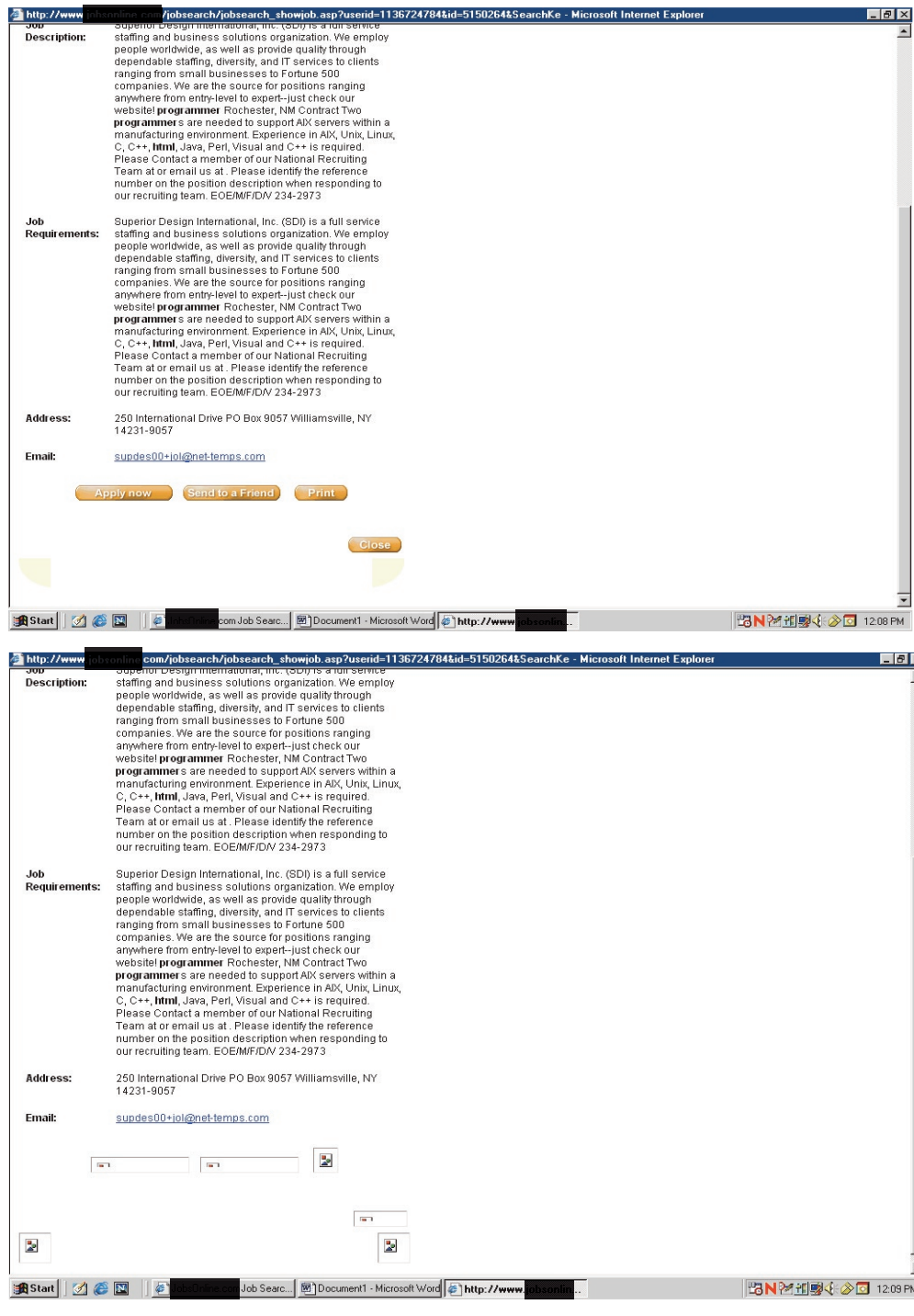
- Apply now
- Send to friend
- Print
- Close

Figure 5: Job Board Resumé Submittal Page

Note the lack of alt text for all images including all critical submit button images:

- Job Search
- Add Skill
- Remove Skill
- Preview
- Reset

Corporate Recruiting Websites Results

Bobby Evaluation

The Bobby evaluation of the top 14 E-recruitment sites and those of the 17 Fortune 500 sites were found to be quite similar, so their results are combined here. The home pages of the corporate E-recruitment sites fared somewhat better than the job boards, with eight of the 31 (26%) passing without any priority one errors (see Table 3 on this page). Again, the most common error detected was lack of alternative text for an image. Of the eight that passed without errors, all had between nine and 11 Bobby "user checks" that needed to be performed to determine if it actually could be "Bobby approved." At the career page level only three companies' sites passed without any Bobby priority one errors. The job search pages did slightly better, with five passing without errors although all had between five and nine user checks. Bobby again had difficulty with many of the resumé submittal pages, as most required a sign in. Only one of the 11 resumé pages Bobby was able to access were free from priority one accessibility errors.

Simulated Process Evaluation

The findings from the simulated application process of corporate sites are similar to those of the job boards (see Table 4, page 17). Nearly all of the home pages examined (11/12) had accessible links to the careers page. The one site in which access was problematic had its career link embedded in an auto-submit combo box. Given the apparent effort this company made to make everything else on its home page accessible (and the fact that the combo-box had a submit button) makes it appear as if the auto submit feature was an accidental oversight. That site did have an accessible link to the site map that contained a text link to the careers page. Nine of the 12 careers pages contained accessible links to the essential job search and resumé submittal pages. Seven of the 12 job search pages were accessible and the same number of the search results had accessible results that allowed application for a position identified. Overall, only three of the twelve corporate sites evaluated were found to be accessible throughout the entire job search and application process using information available to a screen reader and keyboard navigation.

The types of accessibility issues encountered on the corporate sites were very similar to those found with the Job Boards. Fifteen of the 20 inaccessible corporate recruiting pages lacked alt text for critical "submit" or "continue" image buttons. Six of the problem pages contained essential links lacking alt text required for a

Table 3: Corporate Web Recruiting Sites, Bobby Priority One Test Results				
	Home Pages	*Sign up page*	*Job Search*	*Resumé Builder*
Number of sites Bobby evaluated	n=31	n=29	n=29	n=11
% Accessible (no priority one errors detected)	26%	10%	17%	9%
Accessibility errors noted				
Provide alternative text for all image-type buttons in forms	19%	10%	28%	9%
Provide alternative text for all images	52%	79%	59%	64%
Give each frame a title.	10%	10%	28%	36%
Provide alternative text for all image map hot-spots.	13%	14%	7%	none
Each frame must reference an HTML file	3%	none	7%	9%

screen reader and three contained problematic automatically submitting "combo boxes."

Several examples of career pages are shown on the following pages to show some of the issues encountered. Figure 6 (see page 18) shows the primary careers page for a Fortune 500 company. The page contains 27 careers related links as images, all of which are lacking alt text. Luckily the site map link does have alt text and is accessible from this page. The site map allows access to all the inaccessible links on the career page. However, both the resumé builder page and the search results page also make heavy use of images, most of which are without associated alt text thereby making those pages inaccessible. Figure 7 (see page 19) is another example of a typical career page of a Fortune 500 company.

Although the search and apply link is accessible, all of the primary links lack alt text ("Working at . .," "Campus recruiting," "Search jobs," "Career development," etc.). Alt text that could be applied to these would be as simple as duplicating the text used in the image. All the header/titles/descriptions that describe the contents of the lists on the page are images lacking alt text. Note that the site index link (upper right hand corner), which presents many of the inaccessible links available from this page accessibly, is itself inaccessible due to the lack of identifying alt text. Also the photographs of employees are links to a description of their experiences as employees—information that is unavailable to a screen reader without alt text descriptions.

Figure 8 (see page 20) shows the job opportunities page of a Fortune 500 company through which all career traffic is routed. Note that all links listed along the left hand side of the screen are images and none of the images contain alt text. This page is a dead end for a non-sighted user. What is interesting about this site is that several of the pages it links to, such as the career search page, actually contain text links to most of the pages, but the only way to get there is through this completely inaccessible page. This type of inconsistency was encountered on many sites and pages.

It was not unusual to find pages that were almost accessible, such as that shown in the example in Figure 9 (see page 21). Clearly an attempt to make the information accessible was made, as even the required information asterisk images had alt text. Unfortunately the even more important detail of the submit image button to begin the search is missing alt text.

An extreme example of inaccessibility is shown in Figure 10 (see page 22), which shows a job listing accessed from a search results page. The "Careers Quickpick" list/combo box lacks an alt tag for its image, so it is unclear what its purpose might be. The combo box is also designed to automatically submit, allowing easy selection of different opportunities via a mouse. As previously noted, this approach makes it problematic to navigate from the keyboard as it automatically submits when a change is made. The navigation buttons lack alt text so basic screen readers such as Microsoft's Navigator would just read "link, link, link, link . . .."

More sophisticated screen readers such as JAWS read the link address of the button. As noted previously, the addresses can be virtually unintelligible, as can be seen from examples taken from this page:

- First: Javascript:submitrecordflag('first','/company/companies/Maincareers.jsp')
- Back to Search Results: http://www.company.com/company/companies /Maincareers.jsp?BV_sessionID=@@@@1493205465.1017437931@@@@&BV_EngineID=ccccadcchk

Figure 11 (see page 23) demonstrates what an accessible job search page could look like and some simple features can make a good page even more accessible. All of the images used have alt text, and this page goes beyond basic text to include descriptive explanations to improve a screen reader users experience. For example, the alt text for the "help" button is not merely "help," but reads "click on help for Job Category searching." The page also includes useful hints on how to navigate it with only keyboard commands, and offers a link to a screen reader.

Figure 12 (see page 24) shows an excellent example of an accessible job application/resumé builder page. Many of the fields have additional information specifically provided for screen reader use in the form of alt text, greatly simplifying completion by the applicant. This additional information is alt text cleverly "hidden" as a clear image behind the fields to not be distracting in the "images on" view. This way the information only appears when a screen reader is in use or when images are turned off on the browser.

Table 4: Summary of Simulated Application Process: Corporate Sites
Screen reader/Keyboard navigation barriers encountered

Company	Home Page: Careers link accessible	Careers page	Resumé builder	Search Page	Search Results	Other
Company 1	✓	✓	✓	[auto submit ✗] [Alt Text ✗]	[Alt Text ✗]	Many informative links on Careers page inaccessible
Company 2	[auto submit ✗] *	✓	✓	✓	✓	*Home page link to Careers page inaccessible—can be accessed via site map
Company 3	✓	[image Alt Text ✗] *	✓	✓	✓	*All links inaccessible on central job opportunities page—dead end!
Company 4	✓	✓	[Alt Text ✗]	[Alt Text ✗]	[Alt Text ✗]	
Company 5	✓	✓	✓	✓	✓	Excellent site, many accessible features
Company 6	✓	[image Alt Text ✗] [Alt Text ✗]	[Alt Text ✗]	[Alt Text ✗]	✓	
Company 7	✓	✓	[Alt Text ✗]	[image Alt Text ✗] [Alt Text ✗]	[Alt Text ✗]	
Company 8	✓	[image Alt Text ✗] *	[image Alt Text ✗] [table ✗]	✓	[image Alt Text ✗]	*All essential links on careers page are inaccessible. Must use site map to access search or resumé pages
Company 9	✓	✓	[Alt Text ✗]	✓	✓	Intermediate "help" contents page inaccessible
Company 10	✓ *	✓	✓	✓	✓	* Careers page difficult to navigate to from home page
Company 11	✓	✓	✓	✓ *	✓	* Some alternate search screens lack alt text for submit buttons
Company 12	✓	✓	[Alt Text ✗]	[auto submit ✗] * [Alt Text ✗]	[Alt Text ✗]	*Auto-submit list occurs before main search –confusing to screen reader users
Overall	11/12 ✓	9/12 ✓	6/12 ✓	7/12 ✓	7/12 ✓	

✓ Minimally accessible: basic information and links are accessible via screen reader and keyboard. (Other links and buttons may lack alt text and other accessibility issues may still exist.)
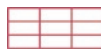
[Alt Text ✗] Essential submit button image missing alternative text (i.e. search, go, continue, submit)

[image Alt Text ✗] Essential image link missing alternative text

[auto submit ✗] "Combo box" menu automatically submits on change not keyboard accessible—item is submitted as soon as item is selected (impossible to get beyond first item in menu)

[table ✗] Inadequately labeled tables

[frame] Frames issue—can't access essential areas of page with keyboard

Figure 6: Main Careers Page of a Fortune 500 Company

This is an example of an image-heavy careers page.
- All 27 careers-related links are images, all of which are lacking alt text.
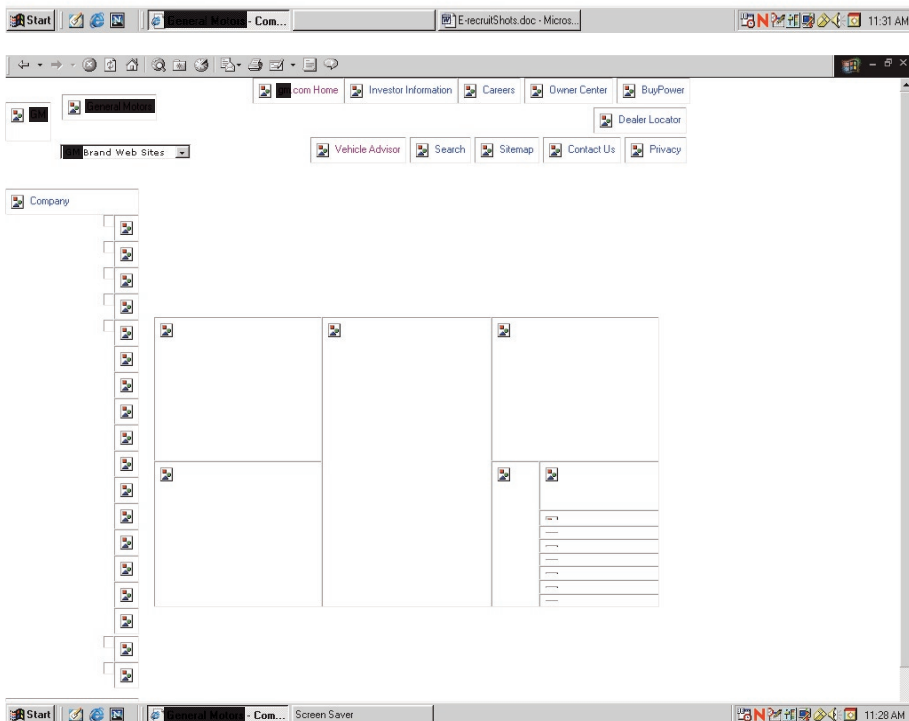- Luckily the site map link does have alt text and most links are accessible from that page.

Figure 7: Main Careers Page of a Fortune 500 Company

This is the career page of a Fortune 500 company.

- Although the search and apply link is accessible, all of the primary links lack alt text ("Working at . .," "Campus recruiting," "Search jobs," "Career development," etc.). Alt text that could be applied to these would be as simple as duplicating the text used in the image.

- Note that the site index link (upper right hand corner), which presents many of the inaccessible links available from this page accessibly, is itself inaccessible due to the lack of identifying alt text.
- The photographs of employees are links to a description of their experiences as employees—information that is unavailable to a screen reader without alt text descriptions.
- All the headers/titles/descriptions that describe the contents of the lists are images lacking alt text.
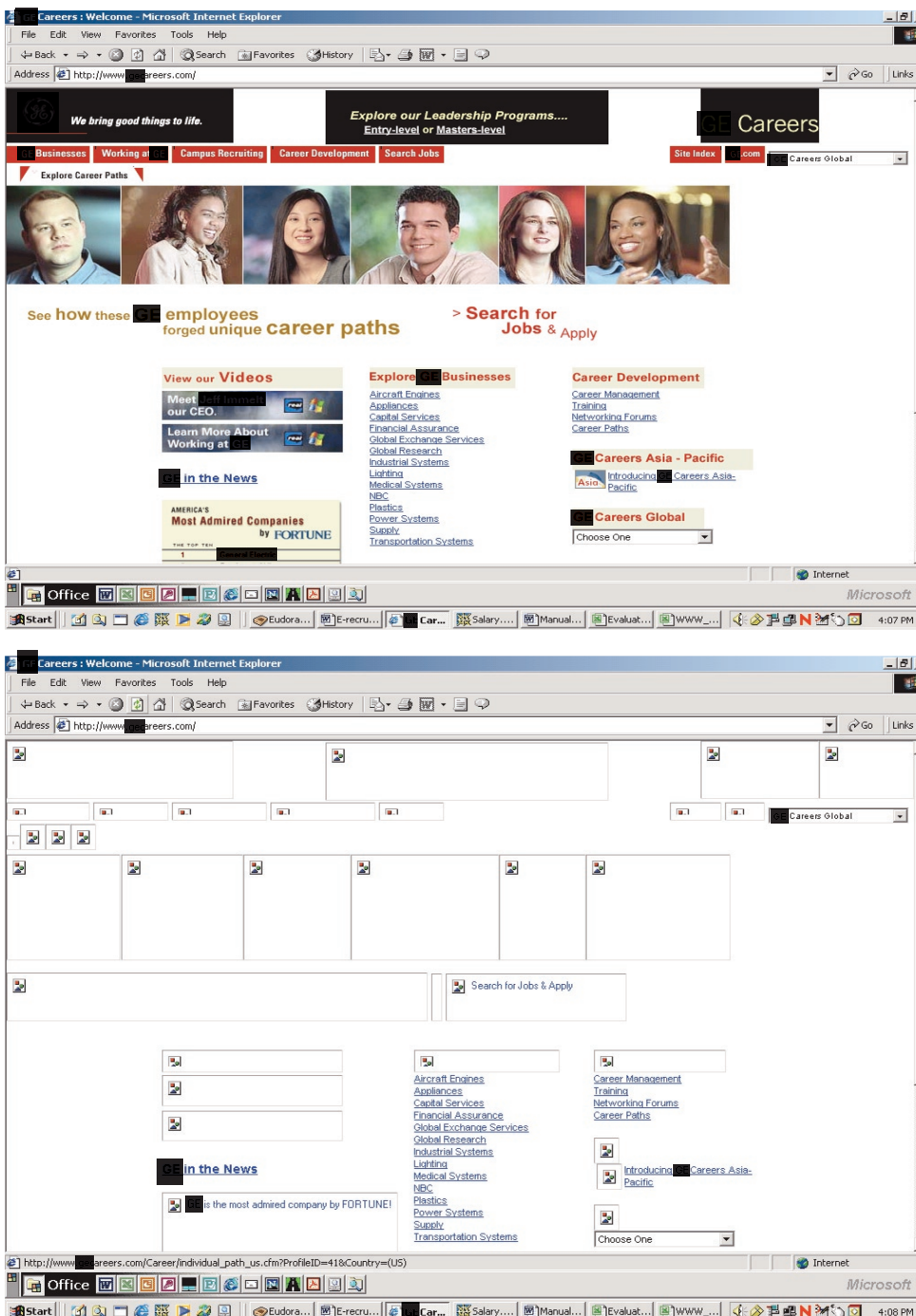
Figure 8: Job Opportunities Page of a Fortune 500 Company

This is the job opportunities page of a Fortune 500 company through which all career traffic is routed.

- Note that all links listed along the left hand side of the screen are images and none of the images contain alt text. This page is a complete dead end for a non-sighted user.

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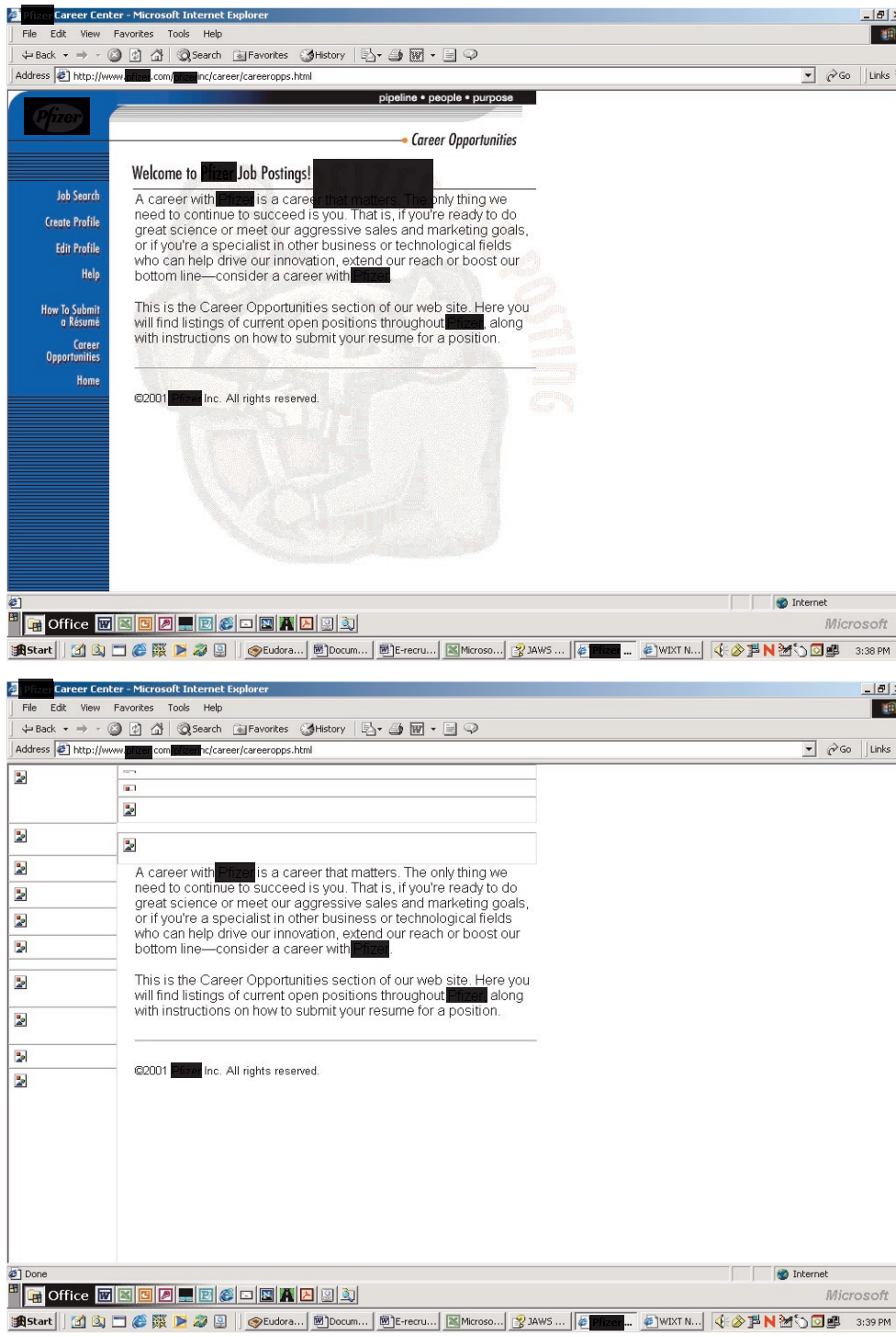
Figure 9: Job Search Results Page of a Fortune 500 Company

- The "Careers quickpick" title is an image without an alt tag.
- The "quickpick"combo box is a problematic auto-submit list
- All navigation buttons lack alt text.
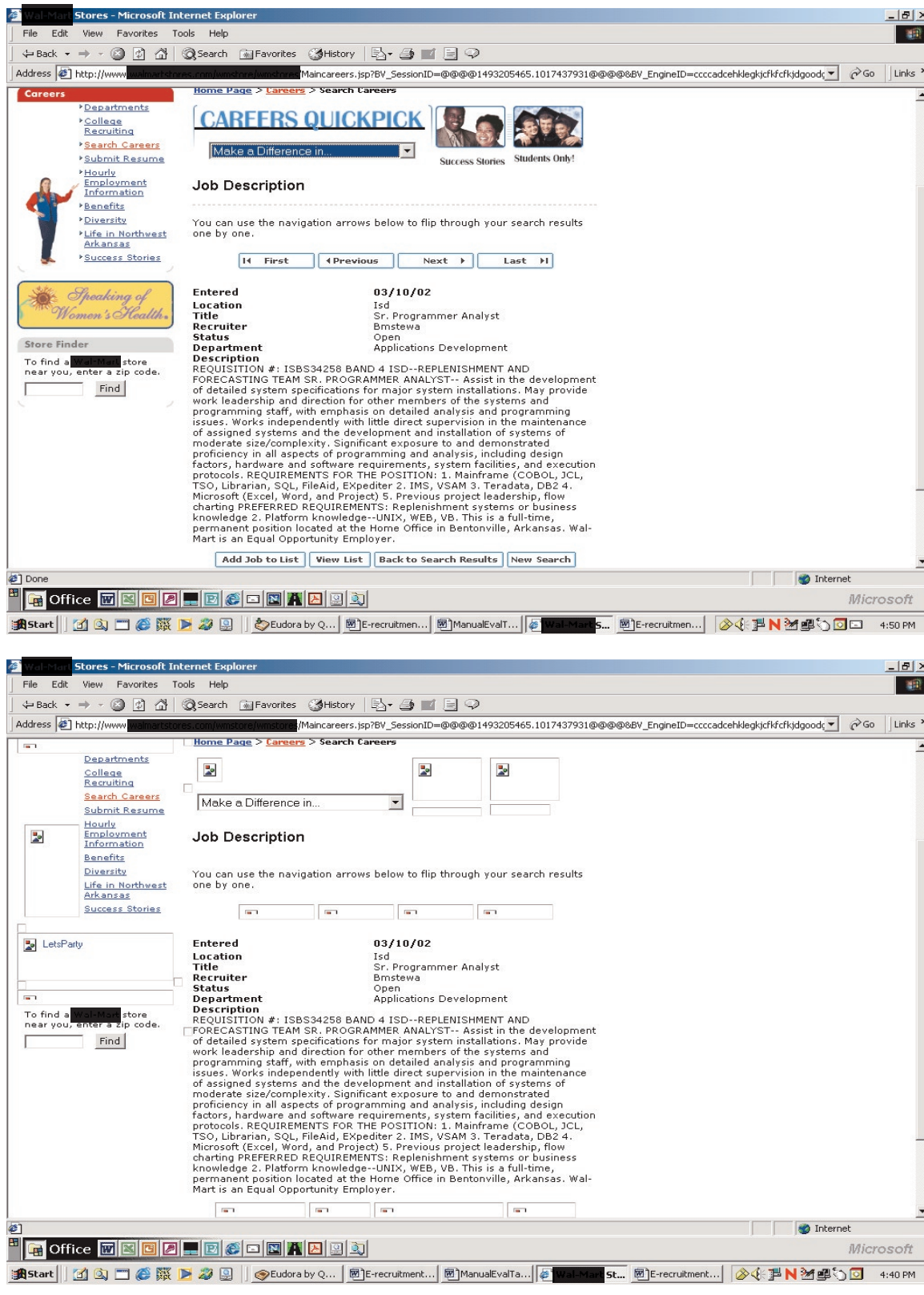
Figure 10: Corporate Job Search Page

This is an interesting example of a nearly accessible corporate job search page.

- The required fields denoted by the red asterisk images are identified with alt text "this field is required" (an item that is frequently forgotten in many of the other sites)
- The critical "OK" and "Cancel" image buttons lack alt text.
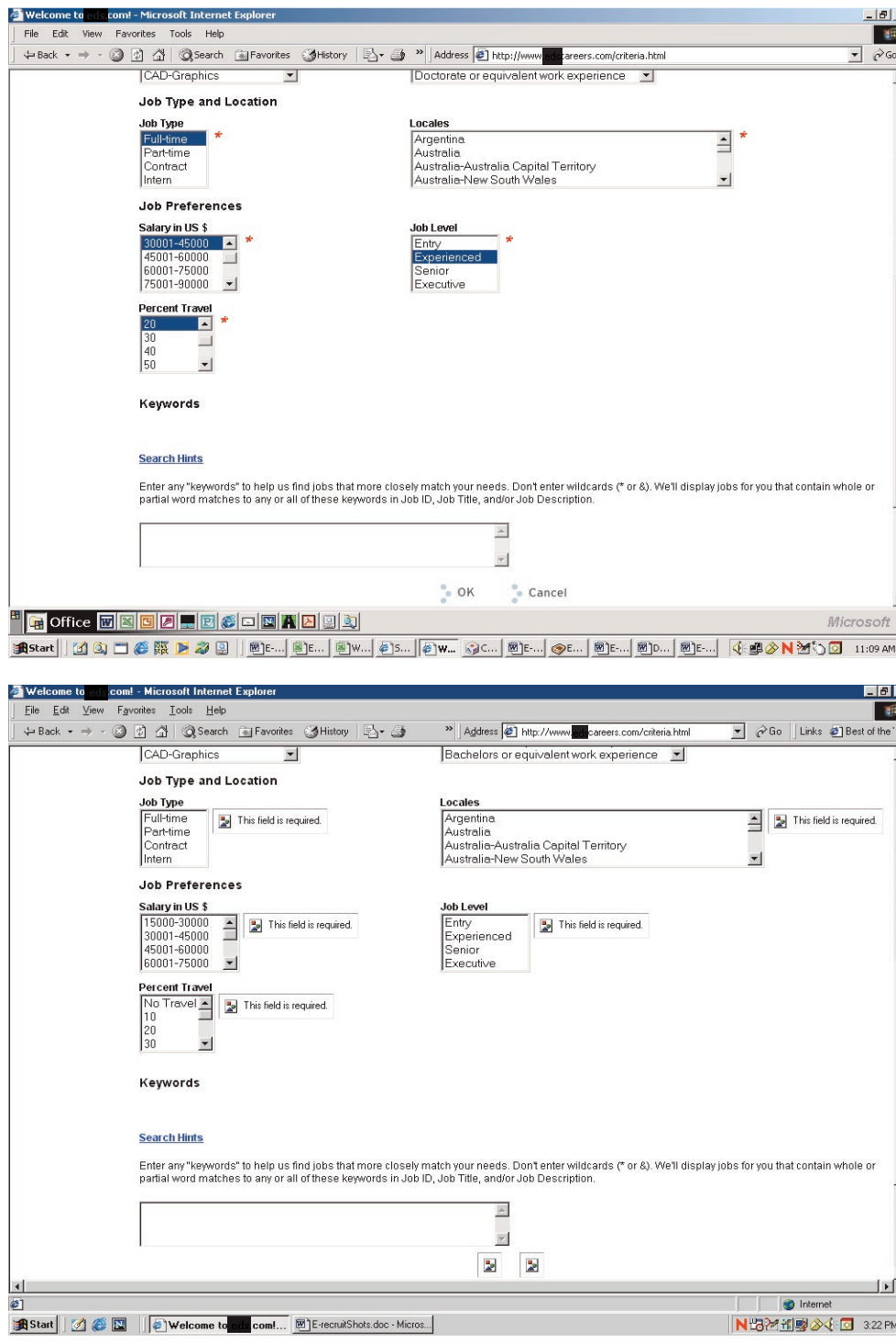
Figure 11: Example of an Accessible Job Search Page

This page is an excellent example of an accessible job search page.

- Note that all the images (i.e. the question mark icons) have alternative text.
- The designers actually include truly descriptive tags—instead of simply "help" it is "click here for help on..." .
- The page also includes useful hints as to how to navigate it with only keyboard commands and offers a link to a screen reader.

Figure 12: Example of an Accessible Job Application/ Resumé Builder Page

This site is an excellent example of what can be done to make a re-sumé builder page more accessible.

- Many of the fields have additional information specifically provided for screen reader use in the form of alt text.

- Note the helpful address and phone number alt text that only appears when a screen reader is in use or when images are turned off on the browser.

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Conclusion

In summary, none of the job board pages (home, job search, signup, or resumé submittal pages) evaluated by Bobby were found to be accessible (without at least one Priority One error). The corporate E-recruiting fared slightly better, with eight of the 31 home pages passing without priority one errors, but only three of 29 sites (10%) career pages and five of 29 job search pages (17%) passed. Only one of the 11 corporate resumé submittal pages that Bobby was able to access was found to be without priority one errors.

The results of the simulated application process using information available to screen readers and keyboard navigation was slightly more encouraging, but still far from ideal. Overall, about half of the job board and corporate pages evaluated were accessible to a screen reader user with keyboard navigation. However, it is important to remember that this is a multi-step process and each step must be accessible for an applicant to actually apply for a position online. Using these criteria, only three of the nine job boards and three of the 12 corporate sites were accessible enough to work through the entire process of registration, job searching, resumé submittal, and application. For the majority of inaccessible pages, fixing the screen reader and keyboard navigation issues would be quite simple. Creating alternative text for the submit image buttons and links would address many of the major roadblocks encountered in the inaccessible sites.

Individual pages could frequently be navigated, and many allowed a user to set up search criteria or complete resumé or registration forms, but then at a critical point were totally inaccessible—most often an image button that had to be clicked to submit the information had no identifying alt text for a screen reader to access. Fully a third of all job board pages and nearly a third of the corporate career-related pages examined contained submit buttons with this problem. To complicate mat-

ters, there were often multiple unidentified buttons (i.e. submit, cancel, go back). Without alt text the screen reader user would have no idea as to which button to select except by trial and error, typically losing the data entered if the guess was incorrect.

The majority of the problems encountered were the lack of alt text, especially in the case of the critical image buttons, which submitted the information from various forms. Correcting most of the problems encountered would be fairly simple and would not require a significant commitment of time or finances on the part of businesses.

It is important to note that making these changes will not make the entire site accessible for all users with disabilities, but it would be a step that would vastly improve accessibility for those using screen readers and accessing sites using keyboard commands. The majority of these sites contained other image links that lacked alt text and other issues identified by Bobby as problematic that were not evaluated.

Almost all the literature on online recruiting and job postings agrees that the Web is rapidly becoming the medium of choice for many, if not most, companies (Densford, 2000; iLogos Research 2002; Society for Human Resource Management, 2001; Useem, 1999; White, 2001). Given the growth of online recruiting, combined with the frequent access problems discovered in this study, there is a very real potential for certain populations of disabled individuals to be all but cut off from this most promising avenue for job searches and applications. None of the accessibility issues encountered were insurmountable, and most could be easily altered to significantly improve accessibility. It is vital to ensure that career recruiting sites on the World Wide Web are made accessible so all individuals, regardless of their situation, have access to this wealth of jobs available on the Internet.

Website Lists

Top 10 Job Boards[9]
- CareerBuilder.com
- Monster.com
- JobsOnline.com
- Jobs.com
- Dice.com
- HotJobs.com
- Salary.com
- FlipDog.com
- Net-Temps.com
- Vault.com

Top 14 Corporate Web Recruiters[10]
- EDS
- Fidelity
- General Electric
- Guidant
- IBM
- Intel
- Johnson & Johnson
- Lucent Technologies
- Microsoft
- Pfizer
- Price Waterhouse Coopers
- Procter & Gamble
- Sun Microsystems
- United Parcel Service

Fortune 500 Companies Evaluated[11]
- Exxon Mobil
- Wal-Mart Stores
- General Motors
- Ford Motor
- Citigroup
- AT&T
- Verizon Communications
- Philip Morris
- J.P. Morgan Chase
- Bank of America Corp.
- SBC Communications
- Boeing
- ChevronTexaco
- Duke Energy
- Kroger
- Chevron

[9] As defined as the largest number of unique visitors in the month of January 2001 according to Neilsen/Netratings (White, 2001)

[10] Densford, 2000

[11] Fortune 500 list from: http://www.fortune.com/indexw.jhtml?channel=l ist.jhtml&list_frag=list_3column_fortune500_list.jhtml&list=15&_reques-tid=53134

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Related Reports, Publications, and Cornell Online Resources

Reports and Publications

Brannick, A. and Bruyère, S. (1999). *The ADA at Work: Implementation of the employment provisions of the Americans with Disabilities Act.* Alexandria, VA: Author.

Bruyère, S. (1999). *Working Effectively with Human Resource Professionals Using the Employment Provisions of the Americans with Disabilities Act.* New York: The Hatherleigh Company.

Bruyère, S. (2000). *Disability Employment Policies and Practices in Private and Federal Sector Organizations.* Ithaca, NY: Cornell University, School of Industrial and Labor Relations Extension Division, Program on Employment and Disability.

Bruyère, S., and Erickson, W. (2001). *E-Human Resources: A Review of the Literature and Implications for People with Disabilities.* Ithaca: NY: Cornell University, School of Industrial and Labor Relations, Extension Division, Program on Employment and Disability.

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Information about publications is available from the Cornell University web site at www.ilr.cornell.edu/ped

Online Resources

Online resources on accommodations for HR professionals:
http://www.hrtips.org

Online resources on accommodations for person with communication disabilities:
http://www.ilr.cornell.edu/ped/accessforall/

For Further Information on the ADA and IT Accessibility

call 1-800-949-4232 or go to:
http://www.adata.org

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