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Accessibility of Online Advertising:

A Content Analysis of Alternative Text

for Banner Ad Images in Online Newspapers

David R. Thompson, Ph.D.

Loras College

Birgit L. Wassmuth, Ph.D.

Drake University

Abstract

This article reports a content analysis of newspaper practice regarding accessibility of online banner advertising. The researchers apply two techniques that may contribute to a greater understanding of online content: 1) an information location task that requires coding beyond the home page; and 2) coding the underlying structure of Web pages - the HTML Source code. This study provides evidence that three out of four (74.73 percent) banner ads found in online newspapers failed to present accessible content by using informative alternative text in the image tags of online banner ad images. For advertisers, that means millions of both sighted and blind online readers will not be exposed to their advertising messages. A simple solution for making online banner ads accessible is to add a few informative words of alternative text in the IMG tag of the Source code for the Web page.

The purpose of this study is to determine the extent to which banner advertising in online newspapers in the United States is accessible to an audience that consists of people who cannot see or who choose not to view images on Web pages. Content is "accessible when it may be used by someone with a disability" (Web Accessibility Initiative, 2000). When individuals who are blind visit Web sites, they may a use text-to-speech generator that allows them to hear the daily news. The computer literally speaks the Web page by reading the HTML source code.

This is not a lesson in Web design. However, a basic understanding of what a banner ad is and how it gets placed on a Web page is very important. Most online banner ads are saved as "GIF" files, a file format for images. The HTML source code that tells the browser where to display what image looks like this: <IMG

SRC="[path]/[filename].[gif]"> This is called an image tag. A screen reader, such as JAWS (from Freedom Scientific), Window-Eyes (from GW Micro) and IBM Home Page Reader, would pronounce the <IMG> tag as "image."

A screen reader is a "software program that reads the contents of the screen aloud to a user. Screen readers are used primarily by individuals who are blind. Screen readers can usually only read text that is printed, not painted, to the screen" (Web Accessibility Initiative, 2000). "Painted" text refers to letters and numbers that are placed on an image file and saved in a GIF or JPG format. In other words, screen readers cannot read text displayed on image files. For individuals who are blind and for sighted Internet users who may have turned off the "load images" function in their browsers, banner ad images cannot be read.

To provide information about the images that appear on the Web page, text must be added to the image tag. This added text is called an ALT tag or ALT text. HTML source code for an image with ALT will look something like this: <IMG ALT="[some kind of description goes here"] SRC="[path]/[filename].[gif]">. A screen reader would pronounce the words within the quote marks next to the ALT tag.

That is the simple solution, as defined by the Web Accessibility Initiative's HTML Techniques for Web Content Accessibility Guidelines 1.0 (Web Accessibility Initiative, 2000). With effective use of ALT tags, advertisers would increase exposure to their companies, products and services. And, in the authors' opinion, Web users who cannot or do not see the image files will be better informed of those companies and their products and services.

Although this was a study of online advertising, the authors believe the concepts and practices presented here may apply, in general, to further investigation and improvement of Web site design, navigability and interactivity of online media. This is of particular interest, today, because new technologies are emerging that enable Internet access from devices such as cellular phones, pagers, handheld PDAs (Personal Digital Assistants) such as the PalmPilot, and even automobiles.

This empirical study is among the first to examine accessibility of online advertising. And this study is one of the first to systematically examine Source code, the Web-based equivalent to typesetting in the printing process.

Literature Review

For the purpose of this study, the researchers have applied the following definition of a banner ad: a banner ad is "a graphic or image used for advertising on the Internet." This image is often a "GIF" (Graphic Interchange Format) file, although other forms of banners, such as HTML-based interactive or plain-text banners are coming into use (Banner Design, 1998).

The researchers' literature review located only one article (not a scientific study) related to accessibility of electronic newspapers. No advertising literature was found that related to the topic of this study - the accessibility of online banner advertising through use of ALT text. Some literature was found about computer use by blind adolescents and

visually impaired students. However, none of that literature mentioned use of email or the Internet. Also, no literature was found related to news and information seeking by individuals who are blind.

For this baseline study coders were assigned an information location task (Guthrie and Kirsch, 1987; Guthrie, 1988; Guthrie, Britten and Barker, 1991; Thompson, 1993): find a classified ad for specific content in the online newspapers selected as a sample for this content analysis. Coders were instructed to code each banner ad, each "impression," encountered during this task. An information location task that involves classified advertising was used because it allowed the researchers to examine banner use not just on home pages, but at deeper levels of the site's structure or information hierarchy.

According to Phill Jenkins, Senior Software Engineer, IBM Research Division, Accessibility Center (IBM, 2000), "without ALT text, there's no way to get information in a graphic." Also, JAVA applets cannot be seen by any screen reader at this time. However, most screen readers can handle JAVA script. Jenkins said, "The best thing is to put the essence of the ad in the ALT text."

Banner ads are mentioned in IBM's Webcourse, Accessibility for e-business: "For animated images, such as advertising banners, equivalent alternative text must be assigned to each image and it must include all important information from the image" (IBM Webcourse, 2000).

In 1993 Britain's Guardian newspaper began to offer "an electronic service for blind people that transmits the entire paper without any advertising to custom-designed personal computers." According to O'Connor (1993), Mark Prouse, an individual who is blind, said he preferred the Guardian's voice synthesizer because it was faster than the Braille attachment. O'Connor states that James Kelway, managing director of both Aptech (a company that specializes in speech technology) and Electronic Text Network Associates (ETNA), said that, as a community, individuals who are blind "have always been very much more technologically orientated [sic] than any other classification of handicapped people." The project was directed by the Guardian's editorial department.

In October 2000, according to David Rowan, the Guardian's Website editor, a text only version of the website was provided "in part to help visually impaired PC users with programs that assist them" (D. Rowan, personal communication, October 18, 2000). Providing text-only versions of online content is an acceptable solution to one aspect of accessibility in that each page can be voiced by a screen reader. However, content editors for online newspapers (or any other Web site) must be sure meaningful content is not lost in the translation from the Web's graphical interface to the text-only version. Future research may examine possible information loss in converting Web content to machine-readable text.

Text-only versions of online content also present problems because each page must be created and updated in text form. Chisholm (1999) agrees that by providing text equivalents for non-textual online information Web editors can help to make pages accessible to most users with disabilities. However, "this doesn't have to mean providing separate text-only pages, which can result in having to make and update text only

versions of every single page on the site. Instead it's a good idea to build alternatives directly into the main page."

This study examines use of such text equivalents or alternatives in the Source code for banner advertising in online newspapers. According to guidelines created by the Web Accessibility Initiative (2000):

> Content is "equivalent" to other content when both fulfill essentially the same function or purpose upon presentation to the user. ... If [an] image is part of a link and understanding the image is crucial to guessing the link target, an equivalent must also give users an idea of the link target. Providing equivalent information for inaccessible content is one of the primary ways authors can make their documents accessible to people with disabilities. As part of fulfilling the same function of content an equivalent may involve a description of that content. Since text content can be presented to the user as synthesized speech, braille, and visually-displayed text, these guidelines require text equivalents for graphic and audio information. Text equivalents must be written so that they convey all essential content. ... Equivalent information may be provided in a number of ways, including through attributes (e.g., a text value for the "alt" attribute in HTML).

Newspaper editors and publishers are as concerned as ever about trying to increase readership. The results of this study provide indications of the extent to which newspapers consider individuals who are blind to be potential readers.

According to the American Foundation for the Blind, 1.6 million Americans report a "severe functional limitation" in seeing words and letters in print. That number jumps to 8.3 million for persons with severe or non-severe functional limitations for vision. These numbers come from a 1994-1995 survey known as SIPP (Survey of Income and Program Participation). Data excludes persons under age 14. The survey is conducted by the U.S. Census Bureau (E. Gerber, personal communication, October 17, 2000).

According to Elaine Gerber, Senior Research Associate for the American Foundation for the Blind, statisticians have not yet tracked Internet use by vision impaired and blind persons. In addition this study does not consider the number of sighted users who may choose to turn off images in their Web browsers.

Advertising rates and revenues are driven by numbers. Yet, statistics that would help convince ad agencies and their clients to insist upon appropriate use of ALT tags have not been compiled. In addition to the lack of statistics, some advertising professionals do not yet understand the problem.

Peters-Walters (1998) states:

> People with visual disabilities have difficulties accessing information published on the WWW because the Web is a highly visual medium. Web site designers can alleviate the problem of interpreting graphics for people with visual disabilities by using the IMG ALT tag when creating WWW pages. The tag allows the designer

> to embed a text description of the image into the image source code so that a screen reader will be able to describe the picture. (p. 43).

She discusses other issues of accessible Web design, including graphic links, video files, imagemaps, tables, and forms. But they are not factors in this study.

Peters-Walters (1998, p. 45) recommends using "Bobby" <www.cast.org/bobby> to determine accessibility of a Web site. According to that Web site, "Bobby" is a Web-based tool that analyzes Web pages for their accessibility to people with disabilities. After analyzing a Web page, Bobby displays a report indicating accessibility and browser compatibility errors found on that page.

First on the list of criteria for approval by Bobby: provide text equivalents for all images and multimedia such as animations, audio, and video (Bobby, 2000). Again, this study provides evidence of the extent to which text equivalents (ALT tags) are used for banner ads in online newspapers.

To move beyond answering "yes" or "no" to the inclusion of ALT tags in Source code, the researchers defined four degrees of informational value: basic; detailed; generic; and empty. As defined here, basic and detailed ALT tags are considered informative because they give some clue about the nature of the banner ad. These definitions extend Nielsen's (2000, p. 305) discussion of "utility descriptions" which "verbalize the meaning or role of the image in the dialogue: What is the image intended to communicate and what will happen if it is clicked?"

Basic ALT tags are, for example, those that include a company or product name. Some low level of description that at least provides a hint about the possible message on the banner image. Detailed ALT tags are those that provide a higher level of description such as a company name and a simple appeal. For example: ALT= "Midstates Ford ... Call today!"

Non-informative ALT tags were operationalized as: generic and empty. A generic ALT tag is vague. For example: "Click here" or "Advertisement." The screen reader would dutifully pronounce these words. However, no information is provided that helps the listener decide to follow a link connected with the IMG tag. The IMG tag is found in the Source code. Even with "images off" in the browser, the IMG tag itself is unchanged. The researchers applied Nielsen's explanation of the "empty" ALT tag to this study.

As a general rule, ALT text should be provided for all images. But "there are in fact some images that are best annotated with the empty string. If an image is purely decorative and has no meaning other than to make the page look better, then there is no reason to slow down blind readers with having to hear an explanation. For example, it is better to use ALT="" than to use ALT="large blue bullet." Meaningless images should have an empty ALT string rather than no ALT text at all because the presence of the empty ALT string is a signal to the screen-reading software that it can skip the image. (Nielsen, 2000, pp. 305-306)

In other words, with no ALT tag the screen reader would say "image." With an empty ALT tag (ALT=""), the screen reader would say nothing and move on to the next

readable text. The empty ALT was included as a variable in this study because "no information" certainly is non-informational. If the IMG tag for an advertising banner included the empty ALT, it would guarantee that no advertising message would be conveyed by the screen reader.

By extending Nielsen's description of the importance of utility description ("What is the image intended to communicate and what will happen if it is clicked?"), the researchers identified another possible problem with banner advertising - animated GIFs. ("GIF" means Graphic Interchange Format and refers to a type of "save as" format for images.)

GIFs can be "animated." Not turned into cartoons, but multiple images can be shown within one image file. The closest analogy may be a slide show in which one image after another is shown. Often, animated GIFs are used for advertising banners because multiple messages, or different parts of a message, can be displayed. In effect, this extends the capacity for content without enlarging the dimensions of the image. And animated GIFs are like the old Burma Shave campaign. A series of identically-sized, small signs was placed along a highway. As travelers moved along the highway the next sign came into view. Each sign was a piece of the overall advertising message:

* Said Juliet

* To Romeo

* If you don't shave

* Go homeo

* Burma Shave

Briggs and Hollis (1997) argue that banner advertising "works with or without the added benefit of click-through. The banner ad is a legitimate advertising vehicle in its own right." This may be particularly relevant to animated banners. However, without appropriate, descriptive ALT text, banner ads of any kind are dysfunctional to individuals who are blind.

An extensive literature review did not produce any sources directly relevant to this study. However, sources that were found referred to different meanings of the word "blind" and to portrayal of blind persons in advertising. In 1988 an article in U.S. News & World Report referred to an untapped market - senior citizens - as advertisers' "blind spot" (Pomice, 1988). In 1990 in Great Britain an advertising campaign sponsored by the Royal National Institute for the Blind used print ads and TV commercials to focus on the "achievements of the visually-handicapped" (Bidlake, 1990). In 1992 an article about a Coca Cola sign on New York's Times Square was titled: "Well, it's high time they did something about Times Square - and if we hear `uh-huh!' just one more time after all this, blind guy or not, we're gonna smack someone" (Bergstrom, 1992). In 1993 a public service campaign was introduced sponsored by the American Foundation for the Blind. The campaign was designed to demonstrate how capable individuals who are blind can

be, according to Carl R. Augusto, AFB president and executive director (Cooper, 1993). These four articles were written before the "rollout" of the Internet.

Archer (1997) wrote about a television ad for tequila that stars a blind man. There was no mention of an online counterpart to the TV spot. Moran (1999) wrote about online advertising company Flycast Communications' mistake of failing to "blind copy" (BCC) an email message to about 500 customers. The customers got together and circumvented the services provided by Flycast.

In 1999, McDonald's featured a television ad that depicted "a blind girl learning to read. Seven-year-old Hannah Weathered celebrates her accomplishment of learning to read her first book in Braille with a trip to a McDonald's restaurant, where she proceeds to order a Happy Meal from a Braille menu" (McDonald's Heart-Tugging Ads, 1999). In 2000, an article announced the end of a long-term relationship between the advertising agency D'Arcy and the Royal National Institute for the Blind in England (RNIB Splits, 2000). A television ad in South Africa was withdrawn in response to public outcry. The "ad shows a guide dog deliberately leading its blind owner into a street pole to get at the fried chicken she has just bought" (Pearson, 2000).

No evidence was found of studies, or even discussion, of online advertising accessible to individuals who are blind. Even at the Internet Advertising Bureau (IAB) Web site quarterly reports of online ad revenue and recommendations for standard sizes for ad banners may be found. However, no information about accessibility is included on the site or linked to it (Internet Advertising Bureau, 2000).

Technologies of empowerment, such as the screen reader, have made accessibility to sources such as online newspapers possible. "The most important guideline in using technology for communication is to choose equipment on the basis of the communicator's needs and preferences" (Engleman, Griffin and Wheeler, 1998, p. 794).

The authors of this study of online advertising argue that use of the correct equipment is not enough. The formatting and presentation of computer-mediated messages deserves careful consideration. Appropriate use of ALT text for banner advertising is one aspect of the potential for accessible online news and information. Engleman, Griffin and Wheeler (1998) state: "Effective functional communication results in improved interactions with a variety of persons in a variety of environments" (p. 785). In the authors' opinion, it is time for online advertisers and the newspaper professionals who place their ads to realize that one key to becoming effective communicators is to provide accessible content to those who are blind.

Research Questions

Based on this literature review, two research questions were formed for this baseline study:

R1. Do banner ads in online newspapers include accessible alternative text (ALT tags)? If so, how many?

R2. For banner ads with alternative text, how many ALT tags are "informative" (basic and detailed), as defined by the researchers?

Method

The purpose of this baseline study was to conduct a content analysis that examines the current practice of banner advertising in online newspapers. This article reports data about use of ALT text with banner ads in order to make the ads accessible to individuals who are blind, to sighted users with images turned off in their browsers, and to accommodate new formats such as PDAs, cellular phones, and vehicle-based personal computers. Also, use of ALT tags enable hands-free use of Web-based media including use under constrained situations such as noisy surroundings and under- or over-illuminated rooms (Web Accessibility Initiative, 2000).

Content analysis was chosen because it is an appropriate methodology for establishing baseline data that demonstrates current advertising practice in the profession. "Live" online newspaper sites from across the United States were used for data collection. After pre-testing three sites the coding instrument was finalized. Pre-test data were not included in the data analysis.

For this baseline study, three coders were assigned an information location task: find a classified ad for a Buick in the online newspapers selected as a sample for this content analysis. This method allows data collection from all levels of the classifieds site (Wassmuth and Thompson, 1999). Coders were instructed to code each banner ad encountered along the way during this task and to examine the HTML "Source" code for use of ALT text for all banner ad images.

The coders used identical computers, browser software, and Internet connection: a Compaq Deskpro computer with 120-MB RAM and Pentium P600E processor; a Compaq V700 monitor (17-inch color); Microsoft Internet Explorer 5.0 browser software; and a direct connection to Ethernet with a fiber optic backbone. Data were collected October 16-17 between 5:30 p.m. and 1:30 a.m. each day.

Procedure

Coders were instructed and trained to code the following variables:

Level of Information Hierarchy. (This was collected in order to track the information location process, but not included in data analysis for this study.)

Banner Ad. Coded as "no ad on page," or number [1] of [4], for example.

Banner Type. If the ad was an image, coders were instructed to "right click" the two-button mouse. In the Properties window for the image file type could be determined. Four types of banners were coded: HTML, GIF, JPG, Other.

Animated GIF (multiple frames).

ALT tag. To find the ALT tag, the coder used the View > Source function of the browser. This opened a window in Notepad that displayed the HTML source code.

Coders were instructed to use the Find function in Notepad to locate ALT tags. Search strategies for finding ALT text included looking for these keywords: [filename], ALT, IMG, Position, ads, or a keyword from the banner ad itself. ALT tags were coded as: None, Informative, Basic (includes company, product name, or some other clue about the possible message on the banner image), Detailed (higher level of description, such as a company name and a simple appeal, such as "Midstates Ford ... Call today!"), Non-Informative, Generic (vague, such as "click here" or "advertisement"), or Empty (ALT="").

Sample

For this baseline study a systematic sample was obtained from Editor & Publisher's online listings of newspapers in the United States. Only daily, general interest newspapers were considered. The Editor & Publisher site listed 1,255 newspapers that fit the criteria. Search results listed the newspapers in alphabetical order by name of newspaper, not by state.

A random numbers table was used to establish a starting point. From there every 59th daily, general interest paper was selected for coding. Sixty-eight sites newspapers were selected, however one was no longer online. Usable data were gathered from 67 daily, general interest online newspapers. See the Appendix for a list of these newspapers.

Results and Findings

The findings of this study establish a baseline for further research of the accessibility of online advertising. The researchers have assessed current use of ALT text in Source code for banner ads found in online newspapers in the United States. For this baseline study, descriptive statistics are reported.

This content analysis coded 67 online newspapers. The researchers applied an information location task that forced the coders to go beyond the home page and deep into the hierarchy of each site. The total number of "pages," or files accessed, was 215. This is an average of 3.21 pages per online newspaper.

The total number of banner ads coded was 376. Of the 67 online newspapers coded: no banner ads were found on 11 (16.42 percent); no classified ads were found on four (5.97 percent); and three had neither banner ads nor classified ads (4.48 percent). Of the 215 pages coded: 124 (57.67 percent) included at least one banner ad; 91 (42.33 percent) had no banner ads.

Scott's Pi was used as a measure of intercoder reliability because it accounts not only for agreement, but for probability of disagreement. The minimum level of acceptability for Scott's Pi is p=.75 and 10 percent of the data set is evaluated for agreement. Scott's Pi requires reporting level of agreement for each variable. No overall "percent of agreement" is provided. All variables fell within acceptable range. The results are reported in Table 1.

Table 1

Scott's Pi Scores for Intercoder Reliability

Variable	Scott's Pi (min. p=.75)
Ad on the page (yes/no)	1.00
Number of ads on page	0.90
Type of ad (unknown/GIF/JPG/HTML/other)	1.00
Type of ALT tag used	0.94
Use of frames	1.00

Disagreement about the number of ads on a page resulted from coding two "house ads" which serve as entry points to other parts of the newspaper's content. House ads should not have been coded.

R1. Do banner ads in online newspapers include accessible alternative text (ALT tags)? If so, how many?

More than half (201 of 376, or 53.46 percent) of the banner ads coded had no ALT tag of any kind. One hundred forty-four (144) of the 376 banners coded did include some form of ALT tag embedded in the IMG tag which was found in the Source code of Web pages. That is only 38.29 percent, but it includes non-informative generic tags (such as "click here") and it includes non-informative empty ALT tags (ALT=""). Therefore, nearly two thirds of all banner ads coded failed to include a text-based equivalent for advertising image files. Non-informative ALT tags do not satisfy the Web Accessibility Initiative's (2000) definition: "Content is `equivalent' to other content when both fulfill essentially the same function or purpose upon presentation to the user. ... Text equivalents must be written so that they convey all essential content."

Image files that were not advertising banners, such as news photos and banners that provided entry points for other parts of the newspaper's site ("house ads"), were not coded in this study. Twenty-eight (7.45 percent) of the 376 ads were found on pages built with Frames so no IMG tags at all appeared in the files' Source code. These ads were coded as "no ALT." Eight of the 376 ads were "combination" ads - a banner GIF that had no link, but underneath that banner image was an HTML link. A total of 12 HTML links were found. HTML links are not reliant on ALT text to be effective with screen readers.

Thirty JPG image files were found. They cannot be animated. One hundred sixty-three (163; 43.35 percent) of the 376 banner ads were animated GIFs. For advertisers who use animated, multiple-image banners, appropriate use of ALT text would assure that full information found in the banner would be conveyed to those who use screen readers.

R2. For banner ads with alternative text, how many ALT tags are "informative" (basic and detailed), as defined by the researchers?

Some form of ALT tag was found for 144 (38.29 percent) of the 376 ads coded. ALT tags may be considered either informative or not. As defined in this study, informative ALT tags are "basic" (provide some clue about the nature of the company or product advertised such as the company name) and "detailed" (provide the company name or URL and additional information such as a phone number or brief sales pitch). For all banner ads, 64 informative ALT tags were found. That is 17.02 percent of the 376 ads found.

Thirty-nine (10.37 percent) basic ALT tags and 25 (6.65 percent) detailed ALT tags were found. Even combined, fewer than one in five (17.02 percent) banner ads includes helpful information in the Source code.

Of the 144 ads with ALT tags, 39 (27.08 percent) were basic and 25 (17.36 percent) were detailed. Non-informative ALT tags have been described by the researchers as "generic" (such as ALT="click here" or "advertisement") and "empty" (ALT=""] because they do not convey helpful information to the online user through the text-to-speech device. Generic ALT tags are vague. Empty ALT tags are skipped over by the reading device.

Of the 144 ads with ALT text, 67 (46.53 percent) were generic and 13 (9.03 percent) were "empty." Ads that included non-informative ALT text made up 55.56 percent of the 144 ads that included some form of ALT text. Of the 376 ads coded, 80 (67 generic and 13 empty) of the ads that did include some form of ALT text were non-informative. That is 21.28 percent.

A total of 281 banners had no helpful ALT text including the 201 that had no ALT tag at all. That is 74.73 percent of all banner ads found that are not accessible.

Discussion

This study has provided evidence of the need for improving professional practice of providing text alternatives for banner advertising. This is the key finding: three out of four banner ads found in online newspapers failed to present accessible content by using ALT text. A total of 281 of 376 banners had no helpful ALT text including the 201 that had no ALT tag at all. That is 74.73 percent of all banner ads found that are not accessible.

For advertisers that means no access to more than 8.3 million possible customers who have non-severe sight limitations including 1.6 million Americans with severe functional sight limitations. This number does not including the unknown number of children under the age of 14 who could be potential customers, according to the American Foundation for the Blind (E. Gerber, personal communication, October 17, 2000).

An information location task was used in this baseline study as a way to examine online advertising beyond the home page. The researchers believe this is a strength of their research and a meaningful contribution to the literature. The researchers believe their efforts to include HTML code as a source for data will prove to be a valuable contribution to future studies of computer-mediated communication.

A sample stratified by circulation, as an indicator of relative size of the newspaper organization, was considered, yet rejected. In the researchers' opinion, the World Wide Web allows all content providers the opportunity to be perceived as "big," first-rate operations. However, several "big name" newspapers, such as USA Today, the New York Times, and St. Petersburg Times, happened to be selected by the systematic sampling process.

On the Web pages of the 67 newspapers studied, informative ALT tags were found in only 17.02 percent (N=64) of the 376 ads found. As defined by this study, there are two types of informative alternative text: basic and detailed.

Basic ALT tags provide some clue about the content of the banner ad such as company name, URL, or some hint of the product or service. Examples of ALT text that were coded as basic are (comments in brackets were noted by coders): nhpolitics [for a political Web site In New Hampshire]; NH Lottery; Job opportunities; Mazda, Chrysler, Jeep, Chevrolet; White's ACE Building Center; Armstrong Motors; and Carolyn Harris Realty.

Detailed ALT text provides more information than a basic ALT tag does. It may include the company or product name along with additional information such as an appeal to take action. For example, some ALT tags that were coded as detailed are: Bright Ideas for business marketing (same text as the banner ad); Charter Cable - More channels, more choices, better TV; Shawnee Cabinets - Kitchens, Tables and Cabinets; and Instant Cash - <www.freecashok.com>.

In addition to no ALT tag at all, two types of non-informative ALT text were identified and coded: empty and generic. Ads that included non-informative ALT text made up 55.56 percent of the 144 ads that included some form of ALT text. An empty ALT tag (ALT="") will be skipped by a screen reader. Thirteen (9.03 percent) of the 144 ads with some form of ALT text were empty tags. So, in effect, these banner ads are "invisible." Generic ALT tags were defined as vague, providing no clue that would establish a connection in the mind of the user between the image, the content of the banner, or expectations of what would happen if a link is followed. Sixty-seven (46.53 percent) of the 144 ads that included some form of ALT tag were coded as generic. Examples of generic ALT tags found are: Click here; Picture; ad1.gif; AD2; AD3; Meeting the challenge; and Link Exchange [for a business that sells batteries].

Although not included in the data analysis, coders noticed a misspelling in the image (not Source) of one banner: <www.river rockcommunity.com> was spelled <www.riverrockcommuiy.com>. Another banner image said "click here," but there was no link.

Methodological Challenges

This study presented several methodological challenges. As for any content analysis, collection of usable data depends on the training, knowledge, patience and persistence of the coders. However, because this study required coders to examine both browser content (the Web page) and Source code (Web design's equivalent to typesetting

for printing), data collection was particularly grueling. This is an exhausting process. Average time spent to code each of the 376 banner ads was 3.35 minutes. Compared to studies that evaluate only the appearance of an online ad, this was a long time.

The training process also took longer than expected. Although the two research assistants who helped with data collection were comfortable with the Web, neither was familiar with the level of detail of Source code that this research required.

The author who trained the coders has many years of experience working with HTML coding and a strong working knowledge of online newspaper practices. This author strongly cautions researchers about the challenges of research that involves coding HTML Source. But he encourages other researchers who have a solid background in Web design and up-to-date knowledge of online practices to adopt this kind of methodology.

One reason up-to-date knowledge of professional practice is critical to research like this is demonstrated by this study. Coders often encountered a long string of numbers listed as a filename for a banner ad. This long number string provides no clue about the content of the image: 44592359123702023356. A long string of numbers that shows up as filename is usually pulled from a Lotus database, according to Phill Jenkins (IBM, 2000). And, sometimes, using the Find function in Notepad did not locate this long string in the Source code. These banners had to be identified by placement on the page.

The researcher's understanding of methods used by newspapers for placing banner ads on a Web page allowed him to identify this challenge during pre-testing and to modify training procedures to inform coders how this happens and ways to properly identify the IMG tag for a specific banner.

Software and out-sourced services exist that allow ads to be dropped into predefined locations on a Web page. The page design is a form of template and the ads are cycled (selected randomly or specified for a named location on the page) onto the page each time the page loads. This is how the same ads appear in different spots when a page is refreshed or reloaded. Randomized cycling of ads into a template may mean that the ALT text for an ad is a reference to position on the page such as "ad1," "ad2," "ad3," or "position1," "position2," or "Top," "Right1," "Right2," "bottom."

As the researchers have discovered, the naming conventions for such ads are likely to differ from those of ads that appear to be placed "by hand." Therefore, this process of automatically dropping ads into templates made identification of file names difficult for coders.

Coders had to be persistent and willing to engage in alternative search strategies to find the IMG tags in the Source code that corresponded with the banner ad being coded. Coders were instructed to locate the ad's IMG tag by using the Find function in Notepad. The first strategy was to search for the banner's filename. If that failed, coders used alternative search terms such as "ALT," "IMG," "ads," "position," or location on the page ("top," "right").

When images do not load (coded as "broken"), IMG source may still be found. So coders had to be trained to follow through with their search for ALT text within the IMG tags. At times, it was difficult to determine whether a broken image was an ad or not.

Coders found 10 broken ad images. But coders had to be trained to recognize the difference in path names between the naming conventions used for the page. In all 10 cases, it was possible to determine the nature of the image by carefully examining the Source code for clues such as filename (often a company name was used as the filename) or path that identified the image as being located in a directory for advertisements, e.g., <http://.../ads/100400.gif>.

According to the findings of this study, advertising and newspaper professionals as well as those who create and provide products that allow ads to cycle into Web page templates demonstrate a lack of awareness about accessibility of online banner ads. In the researchers' opinion, it is in the best interest of the businesses that provide online content of any kind to take steps to enable and assure accessibility.

Limitations of this Study and

Recommendations for Future Research

As is the nature of a baseline study, the researchers worked with an unrefined coding instrument. They will continue to develop a more sensitive measurement tool to be used specifically for content analysis of accessibility of online advertising.

According to Phill Jenkins (IBM, 2000), there are three ways to add machine-readable text to IMG tags: title, ALT text, and LONGDESC (a long description that may be used to describe each frame of an animated banner image, for example). Future studies will code for these three types of text-based information.

Sample size used was relatively low. Of the 1255 daily, general interest newspapers found on the Editor & Publisher Web site, 67 were coded. This study has established methodology for similar research that will involve a larger sample.

The time, attention and fatigue of coding both Web pages and their HTML Source code should be considered by researchers who conduct similar studies. Training time was longer than expected since neither of the research assistants knew about the existence of Source code before being trained to code for this study.

Fatigue and frustration are likely, particularly when the ALT tag is not easily identified by filename. In this study the average time for coding each ad was more than three minutes.

Because this was a baseline study, no inferential statistics were applied to the data analysis. The researchers plan to conduct effects studies that involve accessibility as a factor.

Failure to use informative ALT text may be defined as a type of information loss that occurs during the translation from visual Web content to text which is machine-

readable. Future research will examine the issue of information loss in ALT tags. Based on the findings of this study, the researchers believe that even informative ALT text (basic and detailed) does not convey the complete message found in the banner image.

Future research will examine screen readers' pronunciation of letter strings that connect words without spaces, the current naming convention for URLs. For example, how would a screen reader pronounce "www.OnTrac4You.com," "www.nytimes.com," or "www.maderatribune.com"? And are there any word combinations that are innocuous as separate words, but when lumped together as a long letter string (with no spaces between words) may be pronounced as something profane or objectionable?

According to Otis Wilson (JAWS, 2000), in order for a screen reader to recognize word breaks when no spaces separate them, such as a long URL, the first letter of each word must be capitalized in the ALT tag. If no ALT text is provided, a screen reader will read the complete URL of a link target. However ALT text may be used to shorten a long Web address to a few words. A hypothetical example would be using ALT="Delta Airlines-Germany" rather than "http://www.delta.com/schedule/destinations/10212000/

europe/promo/ad/germany." Future effects research will examine people's willingness to follow a link presented by a screen reader as a long URL compared to their willingness to follow a link announced as a short but informative ALT tag.

Finally, because of the challenges of research that examines Source code, the researchers urge others to try to stay up-to-date with professional practices. Without an understanding of page templates and the process of dropping ads into pre-defined positions on the page ("cycling"), matching IMG tag with the image to which it refers would have been nearly impossible.

Conclusions

This article has reported a content analysis of newspaper practice regarding accessibility of online banner advertising. Through effective use of ALT tags - text equivalents for image files - advertisers should be able to increase exposure to their companies, products and services. And Web users who cannot or do not see the image files would be better informed of those companies and their products and services.

Although this was a study of online advertising, the authors believe the concepts and practices presented here may apply, in general, to further investigation and improvement of Web site design, navigability, interactivity, and effectiveness of online media. This is of particular interest today because new technologies are emerging that enable Internet access from devices such as cellular phones, pagers, handheld computers (PDAs) and even automobiles.

The researchers applied two techniques that may contribute to a greater understanding of online content: 1) an information location task that requires coding beyond the home page; and 2) coding the underlying structure of Web pages, the HTML Source code.

This study has provided evidence that three out of four (74.73 percent) banner ads found in online newspapers failed to present accessible content by using ALT text. For advertisers, that means millions of both sighted and blind online users will not be exposed to their advertising messages. A simple solution for making online banner ads accessible is to add a few informative words in the IMG tag of the Source code for the Web page. The researchers hope this study will help to educate advertising professionals about the need for accessible content.

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Appendix

Sample of online newspapers used in this study

Austin Daily Herald

Austin, Minnesota

www.austinherald.com

Bozeman Daily Chronicle

Bozeman, Montana

www.gomontana.com

Chicago Daily Herald

Arlington Heights, Illinois

www.dailyherald.com

Crescent City Triplicate

Crescent City, California

www.triplicate.com

Dover Foster's Democrat

Dover, New Hampshire

www.fosters.com

Enid News & Eagle

Enid, Oklahoma

www.enidnews.com

Garden City Telegram

Garden City, Kansas www.dailynews.net/garden

Helena Independent Record

Helena, Montana

www.helenair.com

Jonesboro Sun

Jonesboro, Arkansas

www.jonesborosun.com

Lancaster New Era

Lancaster, Pennsylvania

www.lancnews.com/newera/index.html

Madera Tribune

Madera, California

www.maderatribune.com

Midland Daily News

Midland, Michigan

www.mdn.net

Nashua Telegraph

Hudson, New Hampshire

www.nashuatelegraph.com

Okmulgee Daily Times

Okmulgee, Oklahoma

www.okmulgeetimes.com

Plano Star Courier

Plano, Texas

www.planostar.com

Riverside Press-Enterprise

Riverside, California

www.inlandempireonline.com

Shawnee News-Star

Shawnee, Oklahoma

www.news-star.com

Sturgis Journal

Sturgis, Michigan

www.sturgisjournal.com

Union Daily Times

Union, South Carolina

www.uniondailytimes.com

Waukegan News Sun

Waukegan, Illinois

www.copleynewspapers.com/newssun

Adrian Daily Telegram

Adrian, Michigan

www.lenconnect.com

Aspen Times

Aspen, Colorado

www.aspen.com/aspentimes

Bloomington Pantagraph

Bloomington, Illinois

www.pantagraph.com

Cedar Rapids Gazette

Cedar Rapids, Iowa

www.gazetteonline.com

Concord-Kannapolis Independent Tribune

Kannapolis, North Carolina

www.independenttribune.com

Denver Post

Denver, Colorado

www.denverpost.com

El Dorado Times

El Dorado, Kansas

www2.southwind.net/~eldtimes

Fort Smith Southwest Times Record

Fort Smith, Arkansas

www.swtimes.com

Hammond Daily Star

Hammond, Louisiana

www.hammondstar.com

Los Angeles Times

Los Angeles, California

www.latimes.com

St. Petersburg Times

St. Petersburg, Florida

www.sptimes.com

Fredericksburg Free Lance-Star

Fredericksburg, Virginia

www.fredericksburg.com

Flint Journal

Flint, Michigan

www.fl.mlive.com

Greeneville Sun

Greeneville, Tennessee

www.greene.xtn.net

Huron Daily Tribune

Bad Axe, Michigan

www.hdtinfo.com

Kingman Daily Miner

Kingman, Arizona

www.kingmandailyminer.com

Lock Haven Express

Lock Haven, Pennsylvania

www.lockhaven.com

Marysville Appeal-Democrat

Marysville, California

www.appeal-democrat.com

The Montgomery Journal

Rockville, Maryland

www.jrnl.com

New York Times

New York, New York

www.nytimes.com

Palo Alto Daily News

Palo Alto, California

www.paloaltodailynews.com

Roanoke Rapids Daily Herald

Roanoke Rapids, North Carolina

www.rrdailyherald.com

San Diego Union-Tribune

San Diego, California

www.uniontrib.com

Terrell Tribune

Terrell, Texas

www.terrelltribune.com

USA Today

Arlington, Virginia

www.usatoday.com

Willmar West Central Tribune

Willmar, Minnesota

www.wctrib.com

Amarillo Daily Globe-News Times

Amarillo, Texas

www.amarillo.net

Bangor Daily News

Bangor, Maine

www.bangornews.com

Brazosport Facts

Clute, Texas

www.thefacts.com/

Chickasha Daily Express

Chickasha, Oklahoma

www.chickashanews.com

Culpeper Star-Exponent

Culpeper, Virginia

www.starexponent.com

Dubuque Telegraph-Herald

Dubuque, Iowa

www.thonline.com

Eugene Register-Guard

Eugene, Oregon

www.registerguard.com

Glendale News-Press

Glendale, California

www.latimes.com/tcn/glendale

Herkimer Evening Telegram

Herkimer, New York

www.herkimertelegram.com

Kane County Chronicle

Geneva, Illinois

www.kcchronicle.com

Las Vegas Review-Journal

Las Vegas, Nevada

www.lvrj.com

Malvern Daily Record

Malvern, Arizona

www.malvern-online.com

Mineral Daily News-Tribune

Keyser, West Virginia

www.newstribune.townnews.com

New Bedford Standard-Times

New Bedford, Massachusetts

www.s-t.com

Omaha World-Herald

Omaha, Nebraska

www.omaha.com

Ponca City News

Ponca, Oklahoma

www.poncacitynews.com

Royal Oak Daily Tribune

Royal Oak, Michigan

www.dailytribune.com

The Sheridan Press

Sheridan, Wyoming

www.thesheridanpress.com

Superior Daily Telegram

Superior, Wisconsin

www.superiorwi.com

Urbana Daily Citizen

Urbana, Ohio

www.urbanacitizen.com

Waynesboro News-Virginian

Waynesboro, Virginia

www.newsvirginian.co

David R. Thompson, Ph.D., is an assistant professor specializing in media technologies in the Department of Communication Arts at Loras College in Dubuque, Iowa.

Birgit Wassmuth, Ph.D., is a professor of advertising and head of the advertising program in the School of Journalism and Mass Communication at Drake University in Des Moines, Iowa.

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Contact: David Thompson, Loras College, Box #198, 1450 Alta Vista, Dubuque, Iowa 52004, <dthompson@loras.edu>, (319) 588-7940.

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