

Web Accessibility for the Blind: Corporate Social Responsibility or Litigation Avoidance?

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Abstract

On September 5, 2006, a legal precedent was set for web accessibility. Federal judge Marilyn Patel sustained discrimination claims by the National Federation for the Blind against Target Corporation. She established that retailers must make their websites accessible to the blind under the Americans with Disabilities Act.

Past research has indicated that eCommerce retailers have largely ignored W3C guidelines for making their sites accessible. This study examines web accessibility motivation under the lens of Corporate Social Responsibility (CSR). A model is developed linking accessibility behavior to a retailer's propensity to engage in CSR activities, the types of products and services sold, complexity of visual web content, and perceived threat of litigation resulting from an inaccessible site. Based on the model recommendations are suggested for future research.

Thirty-two websites of the largest online retailers with a physical presence were analyzed using IBM's aDesigner accessibility tool for the three years before and one year since the commencement of the Target litigation. Results suggest that accessibility of sites has showed significant improvement since the Target case began.

1. Introduction

On September 10, 2006 Federal judge Marilyn Patel (RIAA vs. Napster) ruled that a class action lawsuit brought by the National Federation of the Blind (NFB) against Target, for failing to make their website accessible to the blind, can move forward. This case is important for all retailers marketing on the web because for the first time it opens the possibility of class action litigation for websites that are inaccessible to users suffering from a wide range of disabilities

According to a lawyer with Disability Rights Advocates who are co-plaintiffs in the case, "this is groundbreaking. No court has yet ruled directly that the ADA applies to Web sites, which [this judge] has clearly done in this opinion" [14].

The ongoing lawsuit presents online retailers with an interesting dilemma: should they be proactive and make their extensive websites accessible, or should they risk the adverse publicity from a potentially expensive class action lawsuit led by the NFB, or similar bodies representing other disability groups?

In this paper, it is argued that a company's measurable commitment to web accessibility is indicative of its posture towards CSR. Just as an accessible web site can demonstrate CSR, an inaccessible web site can weaken the other CSR efforts of an organization.

A model is proposed for understanding a company's past accessibility performance in terms of a CSR posture, which is either reactive, defensive, accommodative, or proactive. Motivating factors include a propensity to engage in CSR activities by "doing the right thing", or avoiding the painful consequences of a prolonged litigation battle with organizations representing disability groups. Based on the model several hypotheses are suggested for future research studies.

2. Background

Twelve years ago, there were 8.1 million Americans with visual impairments, 1.3 million of whom were blind (Census Bureau, 1995). A 1999 study estimated there were 196,000 regular computer users over the age of 15 with a "severe limitation in seeing" [17]. In the years since those statistics were published, the number of regular computer and web users who are blind has only increased.

Congress amended the Rehabilitation Act in 1998 requiring Federal agencies to make their electronic and information technology accessible to people with disabilities. Inaccessible technology interferes with an individual's ability to find and use information quickly and easily.

Section 508 (Appendix 1) was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to

encourage development of technologies that will help achieve these goals [19].

Blind computer users will typically use a screen reader such as JAWS from Freedom Scientific or Home Page Reader from IBM, to read a web site's contents aloud. However, a screen reader can only read text; images or animations remain inaccessible unless they have text descriptions associated with them.

The screen reader reads text in a linear fashion. This works well on web content, but creates other issues when the user tries to navigate within the company's website. Sighted users can see a link on a page within an instant. Blind users may have to wait up to two minutes for a screen reader to read all the menu links sequentially before they reach their required link. Notwithstanding the importance of web accessibility, most sites remain partly or very inaccessible [21].

3. Related Work

The purpose of this section is to outline related work in two fields: accessibility for the blind, and Corporate Social Responsibility.

3.1 Web Accessibility

There have been several studies on the experiences of blind users with web accessibility. Blind users often become frustrated and annoyed while using the web [15]. Problem areas range from poorly named links, important text displayed only in a graphic, form fields with incorrect or missing labels and names, and popup windows [16].

In addition, blind users navigate pages by using jump keys built into voice browsers. They then create a mental model of a page, and try to navigate logically to find their target information. Current web accessibility syntactic checkers ignore this "time-oriented aspect" of accessibility. Checkable errors are narrowly limited to the level of the tag description layer [16, 22].

A study of 315 websites over the period 1997-2002 concluded that adding new technology to a Web page increases complexity. This inadvertently increases barriers to accessibility for persons with disabilities. [30]

In one study of web developers' attitudes towards web accessibility the majority of webmasters supported the concept of web accessibility, but cited roadblocks to accessibility such as lack of time, lack of training, lack of managerial support, lack of client support, inadequate software tools, and confusing accessibility guidelines [15].

3.2 Corporate Social Responsibility

The definition of corporate social responsibility is ambiguous because of the vagueness of the word *social* [6]. At one extreme neo-classicist economists such as Milton Friedman denied the validity of the concept of CSR, in the early 70's, decrying it as "a fundamentally subversive doctrine" [9].

In contrast, the stakeholder theory of corporate social responsibility emphasizes a much broader set of social responsibilities for business stakeholders [6]. Stakeholders (in Figure 1) include employees, shareholders, consumers, government and other organizations or groups such as suppliers, trade unions, business associates and even competitors [32].

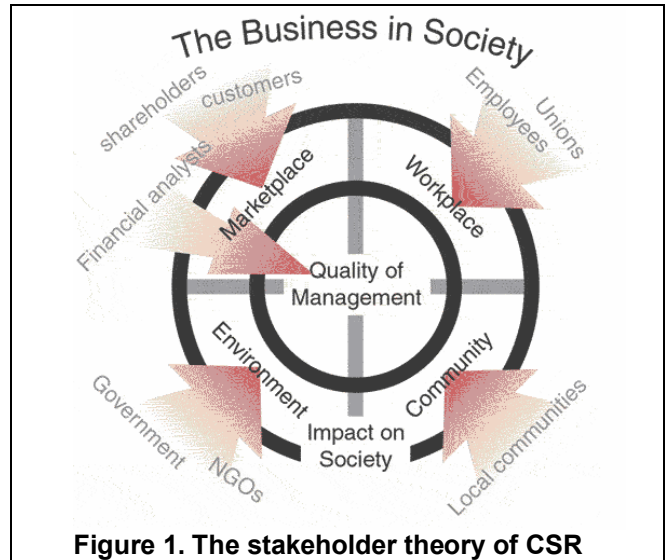


Figure 1. The stakeholder theory of CSR

The World Business Council for Sustainable Development has defined CSR as "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community, and society at large" [13].

Authors have used the terms reactive, defensive, accommodative, and proactive since the late 70's to characterize corporate strategy or posture toward social responsibility [6, 29, and 31].

Reactive companies will deny responsibility and do less than required. Defensive companies will admit responsibility but do the least that is required. Accommodative companies accept responsibility and do all that is required. Proactive companies anticipate responsibility and do more than is required [6].

Recent theories of the strategic use of corporate social responsibility emphasize the role of information asymmetry. Studies have suggested that firms selling durable experience goods or credence services are much more likely than comparable firms to engage in CSR activities. For example, a firm selling financial services (a credence service) is about 23% more likely to opt for CSR. Similarly, a firm producing durable experience goods, such as automobiles or software, is about 15% more likely to be socially responsible. [28]

4. Model Building

The proposed model in Figure 2 examines website accessibility in relation to CSR posture. Accessibility measurement issues are discussed in the next section. The observable CSR posture of an organization, based on its web accessibility history, can be related to its propensity to value and engage in CSR activities in general. CSR posture can be categorized as reactive, defensive, accommodative, and proactive using the RDAP scale discussed in the related work section above [6].

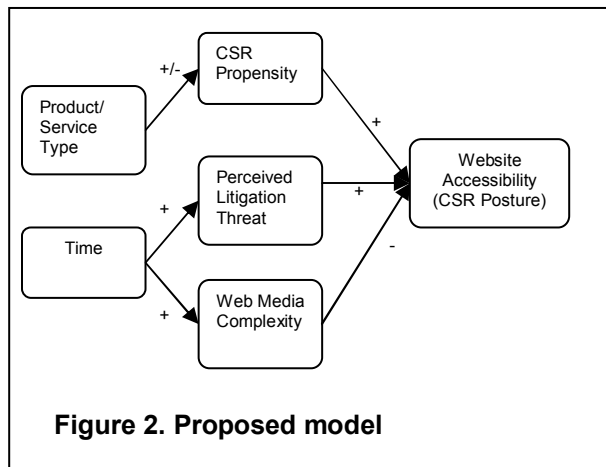


Figure 2. Proposed model

Propensity to engage in CSR activities has been related to the type of product or service offered by the organization. Product type can be categorized as Search Goods, Non-Durable Experience Goods, Durable Experience Goods, Experience Services, and Credence, Services. Companies selling a credence service, such as financial services, or durable experience products, such as cars, involving a degree of information asymmetry, are more likely to take a proactive posture towards CSR activities such as making websites accessible to the blind [28].

Website accessibility can be related to two factors that have continued in parallel over the last few years. On one hand, websites have become more visually complex with liberal use of flash and other technologies that affect

the efficacy of using screen readers. On the other hand, there has been a growing threat of litigation over this period culminating with the lawsuit by the NFB against Target in 2006.

A third possible factor affecting accessibility is a company's internal web designer/developer expertise. This factor is unlikely to be valid in large organizations with fully staffed IT departments, but may be more important in smaller organizations.

In the future research section of this paper several hypotheses are proposed from this model. However, due to time constraints only one aspect of the model will be explored in this paper: the linkage between accessibility behavior and the perceived threat of litigation.

5. Measuring Accessibility

The Web Accessibility Initiative of the World Wide Web Consortium defines accessibility as "enabling people with disabilities to perceive, understand, navigate, and interact with the Web" [12]. To achieve accessibility WAI suggests developers follow a set of technical criteria in writing the underlying Web code [2, 20].

While conformance with standards provides developers with a simple rule-based system to follow, it does not provide valuable insights to the disabled user experience. A more sophisticated model of accessibility is found in IBM's aDesigner software [10].

The aDesigner model uses two measures, navigability and listenability. Navigability measures how easily a blind user can find the information they require on a web site. Navigability consists of reaching time, which measures the time it takes for a blind user to reach the major target elements on a page using a voice browser.

For example reaching times of over 90 seconds will lead to a lower navigability score (out of 100). A well-structured page requires the use of headings or skip-links for the main content in order to achieve a high score for navigability. The aDesigner model will check the ratio of accessible links in the page, where accessible links have readable text, and do not require a mouse or scripts to use it. A high ratio suggests that the page has accessible navigation mechanisms. The model also uses form and table elements for label and header appropriateness. [26]

As blind users listen to the content of a web page, the listenability of the page is an important determinant of accessibility. The aDesigner model derives listenability from a combined code and text-oriented analysis. ALT attributes are checked for the appropriateness of

alternative texts. The aDesigner model can also detect repetitive texts that appear only in voice browsers. If an image has an ALT attribute that is equivalent to the text following the image, the voice browser will read out the same word twice.

Text redundancy is also checked. Web authors often separate each character of a word with a space for a desired visual effect. When interpreted by a screen reader, the extra spaces make it difficult for blind people to understand the meaning of the word.

6. Results

One of the purposes of this paper is to test the hypothesis that the Target lawsuit motivated other retailers to take steps to correct their website's accessibility. Sample companies were selected from STORES' annual report on the nation's 100 top retailers [27].

The current Target suit plays upon whether or not Target's store and Web site are part of an integrated effort. Therefore, only companies with a physical as well as an online presence were randomly chosen. Table 1 below lists the thirty-two retailers included in the analysis.

Table 1. Sample of Large Retailers with Online Presence

A&P	Menard
Albertsons	Office Depot
Barnes & Noble	Office Max
Bed Bath and Beyond	Publix
BJ's	QVC
Blockbuster	Radio Shack
Burlington Coat Factory	Rite Aid
Costco	Ross Stores
Dillard's	Sears
Dollar General	Supervalu
CompUSA	T.J.Maxx
Family Dollar	Wal-Mart
Kmart	Wegmans
Lowe's	Whole Foods Markets
Marshall	Winn-Dixie
Meijer	

The Internet Archive began in 1996 to preserve the rapidly growing web. The Wayback Machine became available in 2001 enabling users to access over 100 terabytes of archived web pages. Archived sites have been growing at the rate of 12 terabytes per month and now number 85 billion pages [11, 24].

Using the Wayback machine the first occurrence of each company's homepage in April 2003 and February 2006 was retrieved. The homepage was also retrieved directly from the company's website on June 1, 2007.

Ideally, several pages should have been sampled on each date. However the Wayback machine archived some subordinate pages of some companies but excluded those of others. It was argued that a corporation is more likely to devote more resources to making its homepage accessible, and that subordinate pages would in general be less accessible than their homepage.

To test whether results were skewed by the absence of subordinate pages, ten websites with available archived home pages and subordinate pages were sampled over the last five years. Accessibility of homepages averaged 65.8 (on the 100 point aDesigner scale) while subordinate pages averaged significantly less ($p=0.008$) at 61.33. Correlation between home and subordinate page accessibility was high at 0.758.

Scores for listenability, and navigability were recorded from aDesigner on a 100-point scale, and tabulated for the time periods before and after the start of the Target suit. Listenability and navigability data were averaged as a proxy for accessibility. Results of analysis are shown in the next section.

Table 2 reveals a number of large companies that have exhibited declining accessibility over the study period. This was surprising given the increased media and legal focus on accessibility. Major retailers such as Radio Shack have for the most part ignored even the most basic of operations to improve accessibility such as including ALT tags for images.

Table 2. Declining Accessibility

Name	Apr-03	Feb-06	Jun-07
Costco	100	49	49
Burlington Coat	88	65	44
Marshall	74	72	40
T.J.Maxx	86	72	60
Radio Shack	18	0	0

The study aimed to find out whether other companies have improved accessibility since the Target lawsuit. It would be interesting to see how Target has responded in the time since the inception of the case in February 2006. Table 3 reveals a dramatic increase in accessibility.

Table 3. Target Corp Accessibility after Lawsuit Begins

	Feb-06 Lawsuit	Jun-07
Accessibility	40	95

Currently Radio Shack and Bed, Bath and Beyond appear to have the worst accessibility based on their 2007 homepages. For the four companies with scores less than 40 in Table 4 it is interesting to note that the National Federation of the Blind launched their suit against Target when its accessibility hovered at the 40 mark.

Table 4. Worst Accessibility 2007

Company	Accessibility
Radio Shack	15
Bed Bath & Beyond	15
Office Max	30
Costco	34
QVC	45
Meijer	59
Marshall	60
Office Depot	62

Several companies exhibited a commitment to accessibility in Table 5. BJ's, CompUSA, and Rite Aid demonstrated perfect scores in 2007 with a steady upward trend over the test period. It is interesting to note that Target's accessibility in 2007 was in the top 25% of companies sampled after a hasty makeover of its website in the past year.

Table 5. Best Accessibility 2007

Company	Accessibility
BJ's	100
CompUSA	100
Rite Aid	100
Dillard's	98
Sears	98
Barnes & Noble	97.5
Albertsons	94
Winn-Dixie	93
Target	93

In Table 6, nearly half of the sample companies demonstrated increases in accessibility since the start of the target suit. In particular, Winn-Dixie, QVC, and Wal-Mart have made the most gains.

Table 6. Largest Gains in Accessibility after Target Case Begins

Company	Change 06-07
Winn-Dixie	1140%
QVC	500%
Wal-Mart	327%
Rite Aid	135%
Target	133%
BJ's	122%
Sears	63%
Dillard's	53%
Meijer	40%

One of the goals of this research was to find evidence on whether companies have significantly improved their website's accessibility since the beginning of the Target case. Table 7 suggests that there was a barely significant improvement in sample accessibility for the three years before the lawsuit. The situation post Target lawsuit in Table 8 suggests a very significant improvement in accessibility. However, given the limited sample size and the small number of webpages from each company tested this result should be treated with caution

Table 7. Accessibility before Target Case Begins

	Apr-2003	Feb-2006	P
Accessibility	49.2	53.4	0.1904

Table 8. Accessibility after Target Case Begins

	Feb-2006	June-2007	P
Accessibility	53.4	74.5	0.0000

7. Future Research

Future research should increase sample size using a comparison of retailers drawn from *Business Ethics* magazine's annual survey of the "100 Best Corporate Citizens", to other retailers drawn from the STORES' annual report on the nation's 100 top retailers. The sampling period should be increased to consider the last seven years of quarterly data gathered from the Internet Archive. Where available archived subordinate pages should be analyzed with their respective home pages.

Structured interviews with developers, designers, IS managers, and senior managers will lead to a better understanding of some of the underlying factors influencing an organization's posture towards

accessibility for blind users. Interviews will also increase knowledge about factors that promote or deter the implementation of web accessibility.

Lastly there is a limit to what can be deduced using a web accessibility simulator such as aDesigner. It is recommended that future research should involve blind users to test website accessibility.

The following hypotheses are suggested based on the model proposed in this paper:

- H1: Search good retailers will have less accessible sites than retailers selling durable experience goods or credence services.
- H2: Companies on the 100 best corporate citizens list will have more accessible websites than other retailers.
- H3: Companies with poor usability prior to February 2006 would improve their website accessibility in response to the Target vs NFB case.
- H4: Corporate website accessibility is negatively related to web media complexity.

8. Conclusions

This paper has taken a different approach from previous studies of web accessibility. By drawing on the rich literature on corporate social responsibility, it was possible to develop a series of interesting hypotheses for future research about a corporation's motivation to make its website accessible.

Results from a limited sample of retailer pages from 2003 until 2006 supported the hypothesis that retailers have significantly improved the accessibility of their corporate websites after the start of the National Federation of the Blind class action suit against Target Corporation. As expected, there was extensive variability in compliance data between companies.

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Appendix 1—Section 508 Guidelines [19]

- a. A text equivalent for every non-text element shall be provided (e.g. via “alt”, “longdesc”, or in element content)
- b. Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation
- c. Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup
- d. Documents shall be organized so they are readable without requiring an associated style sheet
- e. Redundant text links shall be provided for each active region of a server-side image map
- f. Client-side image maps shall be provided instead of Server-side image maps except where the regions cannot be defined with an available geometric shape
- g. Row and column headers shall be identified for data tables
- h. Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers
- i. Frames shall be titled with text that facilitates frame identification and navigation
- j. Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz
- k. A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes
- l. When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology
- m. When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with x1194.21(a) through (l)
- n. When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues
- p. A method shall be provided that permits users to skip repetitive navigation links
- q. When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required