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# Improving Usability of Legal Research Databases for Users with Print-Disabilities

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# IMPROVING USABILITY OF LEGAL RESEARCH DATABASES FOR USERS WITH PRINT-DISABILITIES

## AJ Blechner

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# IMPROVING USABILITY OF LEGAL RESEARCH DATABASES FOR USERS WITH PRINT-DISABILITIES

## I.    Introduction

Ease of access to legal resources has improved in step with advances in technology.  Some users, however, have not shared equally in these improvements.  Librarians have the ability to play a more significant role in leveraging new technologies to assist users with disabilities.[1]  "Ample anecdotal evidence suggests that, while librarians may acknowledge the need for accessibility with regard to their libraries' own web pages, they rarely raise the issue when selecting electronic indexes and databases for procurement from outside vendors."[2]  There is certainly value to ensuring that library websites are accessible to all users.  Yet, if patrons cannot effectively use the resources the library website directs them to, students are not adequately served.

More and more of the information patrons seek is located in indexes and databases that are only available digitally.[3]  The importance of such databases is clear when considering that some libraries hold over "two hundred separate licenses for electronic information."[4]  Students and faculty rely heavily on these resources in completing course assignments and conducting research.[5]  In law school, students also learn to navigate these resources in preparation for professional practice.  Failure to provide meaningful access potentially denies both students and faculty the opportunity to "pursue the research necessary for their advancement."[6]

"Print-Disabled" is a term coined by George Kerscher over a quarter of a century ago, to describe "[a] person who cannot effectively read print because of a visual, physical, perceptual, developmental, cognitive, or learning disability."[7]  As understanding of disability has evolved over the past 25 years so has the definition of persons who are "print disabled."  These changes have tracked largely with developments in law.  A now outdated definition of print disability was included in the Higher Education Opportunity Act of 2008.[8]  When the Google Library Project settlement was reached in November of 2009, the

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1    See *infra* notes 187-200 and accompanying text.

2    Ron Stewart, Vivek Narendra, & Axel Schmetzke, *Accessibility and Usability of Online Library Databases*, 23 LIBRARY HIGH TECH 265, 265-66 (2004) [hereinafter "Stewart, Narendra, & Schmetzke"].

3    *Id.*

4    Duncan E. Alford, *Negotiating and Analyzing Electronic License Agreements*, 94 LAW LIBRARY J. 621, 622 (2002) *available at* http://perma.cc/W62U-58EG.

5    Stewart, Narendra, & Schmetzke *supra* note 2 at 265-66 (2004).

6    Axel Schmetzke & Dave Comeaux, *Accessibility of Academic Libraries Web Sites in North America: Current Status and Trends 2002-2012*, 31 LIBRARY HI TECH 8, 9 (2013) [hereinafter "Schmetzke & Comzeaux"].

7    *The Definition of 'Print Disabled'?*, READING RIGHTS COALITION (2014) *available at* http://perma.cc/7A4G-L6T2.

8    *Id*.

definition of print-disabled was expanded to include users that are "unable to read standard printed material due to blindness, visual disability, physical limitations, organic dysfunction or dyslexia."[9]

With the rapid introduction of new technology and the progressive decline of traditional "print" resources, a more apt description might be that these users cannot fully interact with text without assistive technology. Many print disabled users access the internet "using screen readers, that is, software tools capable of interpreting the HTML code and reading it aloud (with a synthesized voice); interaction is allowed by the use of Braille keyboards or through a combination of key-strokes on the traditional keyboards."[10] In many ways the move to digital resources is a positive step for print-disabled users, but when digital resources are not designed with accessibility in mind, they may present a barrier.[11]

It is important for the purposes of this study to distinguish between accessible design and usable design. Accessibility "refers to the characteristic that products, services, and facilities can be independently used by people with a variety of disabilities."[12] Arguably, both Lexis Advance and WestlawNext are accessible under this definition, as a user with enough patience and training can access the content of these legal research databases. Usability is another matter:

> [U]sable design serves to create products that are easy and efficient to use. Usability has been defined by the International Organization for Standardization as the "effectiveness, efficiency, and satisfaction with which a specified set of users can achieve a specified set of tasks in a particular environment." Usability engineers test the ease at which users can learn to operate a product and remember how to do so when they return to the product at a later time.[13]

This article focuses on *usable* rather than *accessible* design and how functionally useful these legal research databases are to users with print disabilities.

In reference services, often there are many ways to get a patron to the materials that they are seeking. The librarian typically decides which approach to instruct a patron to take. In the case of patrons with print-disabilities, librarians have a unique opportunity to help increase access to legal resources. As a first step, librarians need to learn about the accessibility features of available legal research tools when accessed with assistive technology. Over time, the librarian

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[9] *Id.*; *see also* In the Matter of AUTHOR'S GUILD INC. and AMERICAN ASSOCIATION OF PUBLISHERS INC. et al. v. GOOGLE INC., for Judicial Approval Amended Settlement Agreement, Dated Nov. 13, 2009, *available at* http://perma.cc/4PVR-WKXN.

[10] USER CENTERED DATA MANAGEMENT, ed. M. Tamer Özsu, 75-76 (Morgan & Claypool, 2010) *available at* http://www.morganclaypool.com/doi/pdf/10.2200/S00285ED1V01Y201 006DTM006.

[11] *Id.*

[12] DO-IT University of Washington, *What is the difference between accessible, usable, and universal design?*, ACCESSSTEM, (Jan. 24, 2013), *available at* http://perma.cc/VQ9U-WYDC.

[13] *Id.*

can become an invaluable resource to users with print disabilities, especially those just starting to develop research skills.

Libraries also have leverage when negotiating licensing contracts with legal database vendors. As librarians become more familiar with the accessibility features of legal research databases, they can advocate for provisions in contracts that will encourage vendors to improve the product features. Improving "negotiating and drafting techniques [] will help librarians better serve their patrons by ensuring that the licenses to which they agree promote, rather than hinder, access to electronic information."[14]

There is a great deal more work to be done in this area. As someone entering the library profession, I hope to point out areas where improvement of services to print-disabled patrons is possible. Librarians can play an important role in educating the fledgling legal researcher on available resources and features. "Accessibility guidelines and tools help bridge these experience gaps. Yet, they are a supplement, not a replacement, for empathic imagination, technical ingenuity, and talking to users."[15] Ultimately listening to the requests of patrons seeking accessible services must be of the utmost priority.

## II.    Importance of Creating Accessible Digital Spaces

### a.    Statistical

The sheer volume of patrons affected by these issues justify serious consideration of usability.[16] "People with disabilities constitute America's largest minority group."[17] An article published in Spectrum in 2002 noted that:

> Although there are no statistics on the number of disabled patrons served by law libraries and how well those patrons are treated, general figures indicate that law libraries are encountering more patrons with disabilities than ever before. . . As educational support for students with disabilities improves, more and more will seek law degrees; work in firms, corporations and agencies; and become judges. Law librarians, therefore, are increasingly likely to encounter law students, paralegals, lawyers, judges and others with disabilities.[18]

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[14]    *See generally*, ABA DISABILITY STATISTICS REPORT: A COMPILATION OF STATISTICS ON INDIVIDUALS AND LAWYERS WITH DISABILITIES, THEIR EMPLOYMENT, AND THE LEGAL PROFESSION, American Bar Association Commission on Mental and Physical Disability Law, (2011), *available at* http://perma.cc/MU7K-P3UA [hereinafter ABA DISABILITY STATISTICS REPORT]

[15]    *Accessibility Testing*, W3C, *available at* http://perma.cc/8QV2-AMEP (last visited June 7, 2014).

[16]    ABA DISABILITY STATISTICS REPORT, *supra* note 14.

[17]    *Id*.

[18]    Mary Rumsey, *Libraries Confront the Challenges of Accommodating Disabled Users*, AALL SPECTRUM (Apr. 2002), *available at* http://perma.cc/RK7K-2TJA.

Recent evidence supports this 2002 prediction. In 2011 6.87% of the American Bar Association (ABA) members self-identified as having a disability.[19] In that same year, there was an increase to 5,292 students at ABA accredited law schools requesting accommodations.[20] Yet, the ABA recognized that this number likely does not "reflect an actual estimate or figure as to how many law students in ABA-accredited law schools have a disability," as users with learning disabilities (often referred to as "invisible disabilities") may choose not to self-identify.[21]

Students chose not to self-identify for a number of reasons. Most commonly noted is the concern about stigma associated with identifying oneself as having a disability. This concern is not entirely unfounded, as unemployment rates for graduating law students with disabilities is also disproportionately high, with disabled graduates employment rates "7.6 percentage points lower than the entire class of 2009."[22] This seems in line with four specific challenges students with disabilities disproportionately encounter when seeking a legal education: obtaining accommodation for LSAT testing discouraging students from applying, barriers to completing a legal education program or passing the bar, socioeconomic factors resulting in lower bar association membership rates, and barriers to finding employment after school.[23]

### b. Ethical

The American Library Association (ALA) expressly recognized librarians' ethical duty to provide patrons with disabilities access to digital information.[24] An interpretation of the Library Bill of Rights specifically addresses "services to persons with disabilities."[25] When libraries fail to provide formats that are accessible to users with print-disabilities, the ALA recognizes that this is a discriminatory practice.[26] Not only must the print-disabled have access materials, they must be able to do so "equally and equitably."[27]

The ALA states "[l]ibraries play a catalytic role in the lives of people with disabilities by facilitating their full participation in society. Libraries should use strategies based upon the principles of universal design to ensure that library policy, resources and services meet the needs of all people."[28] The ALA specifically instructs libraries to integrate universal design into the services they offer and states that libraries should work with "organizations and vendors to

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[19]     ABA DISABILITY STATISTICS REPORT, *supra* note 14.

[20]     *Id.*

[21]     *Id.*

[22]     *Id.*

[23]     *Id.*

[24]     See generally, *Library Services for People with Disabilities Policy*, AMERICAN LIBRARY ASSOCIATION, (Jan. 16, 2001), *available at* http://perma.cc/DV4C-LKVR.

[25]     *Services to Persons with Disabilities: An Interpretation of the Library Bill of Rights*, AMERICAN LIBRARY ASSOCIATION, (Jan. 28, 2009), *available at* http://perma.cc/3YUP-PCCR.

[26]     *Id.*

[27]     *Id.*

[28]     *Library Services for People with Disabilities Policy*, supra note 24.

integrate assistive technology into their facilities and services to meet the needs of people with a broad range of disabilities, including learning, mobility, sensory and developmental disabilities."[29]  Universal design is a principle underlying both physical and web design that strives to create environments that are "usable for all, to the greatest extent possible, without the need for adaptation or specialized design."[30]

The International Federation of Library Associations and Institutions (IFLA) includes an ethical responsibility for "librarians and other information workers use the most effective ways to make the material accessible to all. For this purpose they seek to ensure that the websites of libraries and other information institutions comply with international standards for accessibility and access to them is not subject to barriers."[31]  The IFLA states that librarians have a responsibility to provide "equitable services" regardless of "physical or mental ability" but does not expressly state that usability of digital resources is a necessity.[32]

Both the ALA and IFLA include provisions in their ethical statements that relate specifically to individuals with disabilities.  However, AALL provides "no specific guidance on this issue for law libraries [and t]here are no mandates coming out of AALL to create and implement such a law library-specific policy for patrons with disabilities."[33]

### c.    Legal

If the moral justification alone does not provide adequate motivation for thoughtful acquisition of and reference to database services, consider that law protects students with print disabilities, and that equal access is a legal requirement.[34] In 2010 the Department of Education and the Department of Justice Office of Civil Rights "issued guidance to colleges and universities. . .stating that all programs, including pilot programs, are fully subject to the nondiscrimination requirements of the ADA and section 504, including 'ensuring equal access to emerging technology.'"[35]  It is the academic institution, and not the database provider, that is penalized for failing to provide accessible services.[36] As the number of new technological products and services has grown, so has the number of complaints filed by print-disabled students. [37]

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[29]  *Id.*

[30]  TERRY FELKE-MORRIS, BASICS OF WEB DESIGN HTML5 & CSS, 2d ed., 1, 5 (Pearson 2014).

[31]  *IFLA Code of Ethics for Librarians and other information Workers*, IFLA (Aug. 12, 2012) *available at* http://perma.cc/B7TT-KNCD.

[32]  *Id.*

[33]  Stephanie A. Huffnagle, *A Simple Solution: Creating and Implementing a Library Policy for Patrons with Disabilities*, AALL SPECTRUM (Nov. 2012), *available at* http://perma.cc/366R-M4XD.

[34]  ARL, CNI, & SPARC, Special Issue on Services to Patrons with Print Disabilities, 281 RESEARCH LIBRARY ISSUES 1, 28 (Dec. 2012) [hereinafter RLI].

[35]  RLI *supra* note 34 at 3.

[36]  *Id.* at 28.

[37]  RLI *supra* note 34 at 10.

Students whose accessibility needs aren't being met tend to obtain favorable settlements.[38] One recent example of a settlement resulting from lack of accessibility of digital resources can be seen in the *National Federation of the Blind v. Penn State* case.[39] Part of this agreement required a monthly scan of the library website to determine whether new content posted to the library website was accessible and also required that the University search engine capable of searching "across all Library collections, including, but not limited to, e-journals, databases and e-books" meet specified accessibility standards.[40] In addition, in 2012 a complaint filed with the Office of Civil Rights against the University of Montana by a student with print disabilities "inaccessible database materials" were one of the enumerated complaints ultimately addressed in the resolution agreement.[41]

Recent developments in international copyright law have significantly improved the position of libraries endeavoring to increase access for print-disabled individuals.[42] In *Author's Guild, Inc. v. HathiTrust*, Judge Baer for the Southern District of New York clarified that "the law will strongly favor libraries when they do what is necessary – up to and including digitizing millions of books – in order to provide equitable access to materials."[43]

While these developments are certainly helpful, ensuring access to digital databases is not the same as providing access to print materials that the library has purchased.[44] Database access is generally acquired by license.[45] Thus, the license terms "can affect libraries' ability to make works fully accessible. . .Libraries can require that any license come with accessibility 'baked in.'"[46] Unfortunately, users with disabilities typically face a prohibitive wait time, about three years on average, before a version of "new information technology" is accessible to print-disabled individuals.[47] Considering that the average JD degree will be completed in three years, a first year law student may never enjoy the benefits of technology their classmates can access, rendering this wait "an unacceptable and effectively discriminatory length of time."[48]

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[38]   *Id.*

[39]   *National Federation of the Blind v. Penn State*, No. 03-11-2020 (M.D. Pa. filed Nov. 12, 2010) (settlement agreement), *available at* http://perma.cc/KYS7-7825.

[40]   *Id.*

[41]   *See* Keila Szpaller, *Disabled UM Students File Complaint Over Inaccessible Online Courses*, MISSOULIAN, (Sept. 18, 2012) *available at* http://perma.cc/42L3-M24Z; *see also*, *University of Montana OCR Settlement*, CALIFORNIA STATE UNIVERSITY, (2009) *available at* http://perma.cc/UX2D-QNKH; *see also*, *UM Reaches Agreement to Develop New Accessibility Policies, Disability Training*, MISSOULIAN (Mar 20, 2014) *available at* http://perma.cc/RJ4R-R2M6; *see also*, Office of Civil Rights [OCR], *Resolution Agreement*, No. 10122118, *available at* http://perma.cc/XDD8-7RVL (last visited June 7, 2014).

[42]   RLI *supra* note 34 at 16.

[43]   *Id.* (citing *Author's Guild, Inc. v. HathiTrust*, 902 F. Supp. 2d 445 (S.D.N.Y. Oct. 10, 2012).

[44]   *Id.* at 23.

[45]   RLI *supra* note 34 at 23.

[46]   *Id.*at 17-18.

[47]   *Id.* at 26.

[48]   *Id*.

In 2005, Google was sued on the claim that its book digitization project, which could provide substantial benefit to print disabled users, constituted copyright infringement.[49] One of the Google Books' Settlement's strongest proponents was an organization allegedly representing thirty million print-disabled individuals.[50] Under the terms of the settlement libraries may provide "special access" to print-disabled users but must limit use of materials provided to print-disabled users, and such users must receive documentation from:

> A competent authority is a person (1) employed in a professional occupation qualified to diagnose print disabilities under federal law and regulations that govern the National Library Service for the Blind and Physically Handicapped; or (2) licensed under applicable state law to diagnose the existence of a print disability under standard and generally accepted methods of clinical evaluation. (p. 5) Additionally, a professional librarian may certify a user's claimed print disability only if the user affirms in writing that no competent authority is available, or if the user has a print disability that is readily apparent upon physical observation of the user. The user must also provide written documentation that he or she will not reproduce or distribute books in a manner prohibited by the Copyright Act.[51]

This means that self-identification of users with disabilities is a requirement in order for them to gain the special access.[52] To users with invisible disabilities, which are not "readily apparent upon physical observation," the need for self-identification may be a barrier in and of itself.[53]

### d. Technical

The two main guidelines governing accessibility of digital information are: Web Content Accessibility Guidelines (WCAG) & Federal Access Board Standards issued under Section 508 of the Rehabilitation Act.[54] Compliance with these guidelines, even when not required by law, demonstrates an effort to make services accessible to users relying on assistive technology. Both Lexis Advance

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[49] Jonathan Band, *OITP Technology Policy Brief: The Google Library Project: The Copyright Debate*, AMERICAN LIBRARY ASSOCIATION OFFICE FOR INFORMATION TECHNOLOGY POLICY, 1, 3-4 (Jan. 2006) *available at* http://perma.cc/E6XJ-Q645.

[50] Pamela Samuelson, *Symposium: Collective Management of Copyright: Solution or Sacrifice*, 34 COLUM. J.L. & ARTS 697, 723 (2011).

[51] Jonathan Band, *A Guide for the Perplexed: Libraries and the Google Library Project Settlement*, AMERICAN LIBRARY ASSOCIATION & ASSOCIATION OF RESEARCH LIBRARIES, (Nov. 13, 2008) *available at* http://perma.cc/JWJ5-DT5Y.

[52] *Id.*

[53] *Id.*

[54] See Stewart, Narendra, & Schmetzke *supra* note 2 at 267; see also, *Web Content Accessibility Guidelines (WCAG) 2.0*, W3C, (Dec. 11, 2008), *available at* http://perma.cc/DZT8-5CN5; see also *Rehabilitation Act of 1973*, United States Access Board, *available at* http://perma.cc/DZT8-5CN5 (last visited June 7, 2014); *see also*, *generally*, Schmetzke & Comeaux *supra* note 6 at 9.

and WestlawNext state that they are compliant with Section 508.[55]  Lexis Advance also claims that it is compliant with WCAG 2.0 regulations, which provide additional guidelines for websites.[56]  Yet, it is important to note that digital products can comply with 508 without being user-friendly.[57]  While standards provide a good framework, actual assessment of "how screen readers render information is another important piece of the accessibility puzzle that must not be ignored."[58]  A product can receive a rubberstamp even when it is not functional or usable despite a company's good faith efforts to provide an accessible product.[59]

Libraries do not always have the manpower or technological know-how to host and deliver "proxy access" or alternative "accessible copies or versions of" materials that would otherwise be made available to students through database services.[60]  When the resources provided by databases are improperly encoded (or not encoded at all) "it is critical that libraries independently exercise their power as buying agents to improve the state of electronic resource accessibility."[61]

## III.    Research Framework

The purpose of this study is to examine WestlawNext and Lexis Advance functionality from a user-centered perspective for users with disabilities. The testing was done entirely by a single researcher, using internet browsers Mozilla Firefox version 28.0,[62] Safari,[63] and Voice Over (a built in screen reading utility)[64] on a Mac OS X laptop running version 10.7.5.  The tester completed a tutorial training program in Voice Over prior to testing, but had only beginner level experience.[65]  The searches were chosen based loosely on the Rombauer

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[55]     *See*, Thomson Reuters, *Accessibility Notice*, WEST WATCH, (2014) *available at* http://perma.cc/92C5-6TJT; *see also* Chad Braun, *Incorporating Accessibility into Lexis Advance*, Reed Elsevier (2013) *available at* http://perma.cc/6APQ-3C6E.

[56]     Braun, *supra* note 55.

[57]     Stewart, Narendra, & Schmetzke *supra* note 2 at 269.

[58]     *Id.*

[59]     *Accessibility Testing*, W3C, *available at* http://perma.cc/34VJ-D7CT (last visited June 7, 2014).

[60]     RLI *supra* note 34 at 20.

[61]     *Id.*

[62]     Mozilla Firefox is a "free, non-profit browser" that can be used to access the Internet. *Built For the Web*, MOZILLA, *available at* http://perma.cc/AWZ5-9SD5 (last visited June 7, 2014).

[63]     Safari is an "OS X Maverick" which also serves as a way to access the Internet, and it is especially compatible with Voice Over screen reading software. *Safari*, APPLE.COM, (2014) http://perma.cc/FCF6-V39T (last visited May 13, 2014).

[64]     Voice Over is a screen reading utility. "It tells you what's on your screen, and walks you through actions like selecting a menu option or activating a button using your keyboard or trackpad. VoiceOver gives you complete control of your Mac, with no need to see the screen. And it's already built in." *VoiceOver*, APPLE.COM, (2014) http://perma.cc/KD9P-9WRB (last visited June 7, 2014).

[65]     *Voice Over Getting Started*, APPLE.COM, *available at* http://perma.cc/975P-NBJ8 (last visited June 7, 2014).

method, and the types of searches a beginning researcher is likely to perform while learning to be a power searcher.[66]  Five searches were performed:[67]

- Finding and filtering "Personal Jurisdiction" in CJS[68]/Am Jur[69]
- Browsing to find the Americans with Disabilities Act,[70]
- Advanced search for environmental regulation on black liquor[71]
- Search for *Campbell v. Acuff Rose Music Inc*[72] by keyword
- Keyciting/shepardizing *Campbell v. Acuff Rose Music Inc*[73]

All of the testing took place between March 1, 2014 and May 13, 2014.  Thus, some of the findings are likely to be out of date.  A well-respected researcher experienced in performing studies of this type, stated that results in usability studies, "may be outdated by the time they appear in print.  However, this does not render [them] useless.  By demonstrating approaches to assessing the accessibility of online resources, they have blazed a trail that may be followed by others seeking to gain comparable information on newer versions."[74]  This study will provide a snapshot of the current landscape, as well as information for future researchers.

For accessibility testing I used primarily used Mozilla Firefox with the following free toolbar downloads: Accessibility Evaluation Toolbar, [75] WAVE Toolbar, [76] Web Developer Toolbar, [77] and Firebug.[78] PDF documents were

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[66]     MARJORIE D. ROMBAUER, LEGAL PROBLEM SOLVING: ANALYSIS, RESEARCH & WRITING, 1, passim, 5th ed. (West Publishing, 1991).

[67]     The World Wide Web Consortium (W3C) recommends creating a "user persona" or "hypothetical archetypes" with a disability for the purposes of this project. The user persona in this study was a blind, twenty-one year old, first year law student who has only just acquired access to WestlawNext and Lexis Advance and requires the services to perform research for a basic first year legal research purposes. *Accessibility in User-Centered Design: Personas*, JUST ASK: INTEGRATING ACCESSIBILITY THROUGHOUT DESIGN, *available at* http://perma.cc/9GDP-KHCA (last viewed June 7, 2014).

[68]     35B C.J.S, Fed. Civ. Proc. § 781 (2014).

[69]     Jurisdiction in Civil Actions §3-1, 20 Am. Jur. 2d Courts §72 (2014).

[70]     Americans with Disabilities Act, 42 U.S.C. § 12101 (1990).

[71]     40 C.F.R. § 98.274 Monitoring and QA/QC Requirements.

[72]     *Campbell v. Acuff Rose Music Inc*, 510 U.S. 569 (1994).

[73]     *Id.*

[74]     Axel Schmetzke, *Guest Editorial: Accessibility of Web-Based Information Resources for People with Disabilities*, 20 LIBRARY HI TECH 135, 136 (2002).

[75]     The Accessibility Evaluation Toolbar is a "tool [that] supports web developers in testing their web resources for functional accessibility features based on the iCITA HTML Best Practices." *Accessibility Evaluation Toolbar*, Add-Ons, *available at* http://perma.cc/88UF-ZYA2 (last visited June 7, 2014).

[76]     The WAVE Toolbar " provides button options and a menu that will modify the current web page to reveal the underlying accessibility information. It provides an easy-to-use, yet powerful mechanism for evaluating the accessibility and usability of web content for people with disabilities." *WAVE Toolbar*, Add-Ons, *available at* http://perma.cc/CH4J-UY8C (last visited June 7, 2014).

[77]     "The Web Developer extension adds various web developer tools to the browser."  *Web Developer Toolbar*, Add-Ons, *available at* http://perma.cc/35ME-FEAJ (last visited June 7, 2014).

analyzed in Adobe Acrobat Pro IX Pro version 11.0.06.[79]  Records of the marked up pages were created and stored to accompany the user's impressions and reflections on the process of navigating using a screen reader.  It is important to note that using these utilities to test for accessibility can result in false positives; therefore some false positives may be contained in the results.

The assessment model used for the WestlawNext and Lexis Advance primary interfaces was the Web Accessibility Checklist created by AccessSTEM.[80]  The AccessSTEM Web Accessibility checklist provided a good starting place for a beginning researcher.  This framework prompts users to analyze sixteen distinct elements of a website.[81]  For each new page in the search, the steps were repeated to determine functionality - from the point of check-in to a downloaded PDF of the material sought.  The analysis of the Text Only and Mobile interfaces was done exclusively with screen reading software, and captured in webcast videos.[82]

The AccessSTEM criteria yields five primary considerations relevant to legal research databases (for the full sixteen criteria see appendix 1).[83]

- Ability to Navigate
- Cues to Structure
- Useful Labeling of Design Elements
- Awareness of Visual Elements
- Usable Format
- Timed Responses
- Other[84]

Each element has the potential to impact a user's ability to meaningfully access content in an electronic database, and plays a part in the experience the user has locating database content.

Ability to Navigate: Some users with disabilities, such as users with mobility impairments, cannot use a mouse. [85]  Blind users rely solely on the

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[78]    "Firebug integrates with Firefox to put a wealth of development tools at your fingertips while you browse. You can edit, debug, and monitor CSS, HTML, and JavaScript live in any web page" *Firebug*, Add-Ons, *available at* http://perma.cc/MCB3-SQB9 (last viewed June 7, 2014).

[79]    Adobe Acrobat Pro IX Pro is a PDF converter that contains "smart tools."  Adoble IX Pro, ADOBE.COM, http://perma.cc/H64W-FWP9 (last viewed June 7, 2014).

[80]    *Web Accessibility Checklist*, Access STEM, *available at* http://perma.cc/TYY5-827M (last viewed June 7, 2014).

[81]    *Id.*

[82]    The webcast videos were edited to eliminate time taken up by lag loading pages and unnecessary keystrokes and do not appear in their whole and original form but are true to the browsing experience of the user.

[83]    *Web Accessibility Checklist*, *supra* note 80.

[84]    *Id.*

[85]    *Id.*

keyboard to use a computer.[86] Individuals with visual impairment often find it "frustrating and fatiguing. . .to have to have to repeatedly tab through navigation links to get to the main content of a page."[87]  Though it may seem like only a minor irritation, some navigational panes require users to perform over fifty keystrokes to reach the main content of the page.[88]  Appendix 2 contains images of WestlawNext and Lexis Advance's home pages, marked up to show the structure a print-disabled user would encounter if navigating exclusively by keyboard.[89]  Each pink box indicates an area where the user must use a keyboard stroke to move forward.[90]  The numbers indicate the order in which content will be read aloud by the screen reading software.[91]  Ideally the numbers should appear in a logical order.

Skip navigation is the other important element to look for – it is  a mechanism "available to bypass blocks of content that are repeated on multiple Web pages."[92]  Skip navigation, that allows users to move beyond website navigational content, which is often the same from page to page, with a single keystroke, is important to reduce the amount of content that print-disabled users must get through on each page.[93]  Extensive repetition of the same content is likely to be irritating and interfere with the experience of print-disabled users.[94]  The inclusion of 'skip navigation' links "is generally considered a crucial usability feature, particularly for people who use screen readers or navigate by keyboard only."[95]

Cues to Structure: The order in which content is read using a screen reader, may not be the same as it appears visually on the page.[96]  It is the structure of the page, contained in the code that determines the order in which content is accessed by a screen reader.[97] When looking at structure there are two main issues that are important to usability.  First, internal headings must be present and sequentially numbered.[98]  "Many older sites rely on font tags to increase the size of text to give the visual impression of a heading.  However, this is of no use to screen readers, which only recognize proper semantic headings (<h1>, <h2>,

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[86]     *Blind Handicapped Vs. Technology: How Do Blind People Use Computers?*, Int'l J. of Scientific & Engineering Research vol. 3, issue 4, 1,  (Apr. 2012), *available at* http://perma.cc/JQ6-99LR (last viewed June 7, 2014).

[87]     Cameron Cundiff, How-to: Use Skip Navigation Links, A11Y Project, (May 11, 2014), *available at* http://perma.cc/3MXX-RFZL (last viewed June 7, 2014).

[88]     See generally, *Id.*

[89]     See Appendix 2.

[90]     *Id.*

[91]     *Id.*

[92]     Schmetzke & Comeaux, *supra* note 6 at 13; see also, *Skip Navigation*, PENNSTATE ACCESSABILITY, *available at* http://perma.cc/6CC-A7LC (last viewed June 7, 2014).

[93]     *Id.*

[94]     *Id.*

[95]     Schmetzke & Comeaux, *supra* note 6 at 13.

[96]     *Designing for Screen Reader Compatibility*, WEB AIM (Oct. 24, 2013), *available at* http://perma.cc/PK5-74S8 (last viewed June 7, 2014).

[97]     *Id.*

[98]     *Web Accessibility Checklist*, *supra* note 81.

<h3>, etc.) as headers."[99]  Headings allow a screen reader user to get the "layout" of the main points, which a visual user would do by skimming.[100]

Another helpful way to determine the structure or reading order of a page is to disable CSS (Cascading Style Sheets).[101]  With styles disabled "all content should be visible and presented in a reasonably logical order. The idea is to be sure that the page is not overly dependent on a particular style sheet, since users can disable styles or create their own custom style sheets."[102]

A test that was not employed in this study, but that would be useful for further study is whether sites are including Accessible Rich Internet Application Suite (ARIA) and if so whether it is incorporated properly.[103]  ARIA "defines a way to make Web content and Web applications more accessible to people with disabilities.  It especially helps with dynamic content and advanced user interface controls."[104]  Future studies could analyze what legal research tools are employing ARIA attributes.

Useful Labeling of Design Elements: Web pages containing many different design elements, must be effectively labeled to allow print-disabled users to navigate smoothly.[105]  Some of the most important elements are: links, form elements, frames, and data tables.[106]

"Visually challenged visitors who are using a screen reader can configure the software to display a list of the hyperlinks in the document.  However, a list of hyperlinks is only useful if the text describing each hyperlink is actually helpful and descriptive."[107]  Navigating by hyperlink is one of the more convenient ways to locate information with a screen reader.  When these links are labeled poorly, it can be unclear what the link leads to, rendering it useless to the reader without the surrounding content as a frame of reference.  Vague link descriptions, such as "click here" fail to provide the content necessary to identify the link destination to the user.

Form fields encompass a number of elements of web pages that users interact with on a daily basis including: "text boxes, check boxes, and buttons."[108]  A form element is a feature on a website that "can accept information from website visitors."[109]  For a print-disabled user to effectively interact with form fields, they must be labeled in a way that the conveys the form's purpose so that a print-disabled user can interact with it.[110]

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[99]     Schmetzke & Comeaux, *supra* note 6 at 13.

[100]    *Designing for Screen Reader Compatibility*, *supra* note 96.

[101]    *Web Accessibility Checklist*, *supra* note 81.

[102]    *Id*.

[103]    *WAI-ARIA Overview*, W3C, (Mar 20, 2014) *available at* http://perma.cc/P4XE-RLJE (last viewed June 7, 2014).

[104]    *Id*.

[105]    *Web Accessibility Checklist*, *supra* note 81.

[106]    *Id*.

[107]    TERRY FELKE-MORRIS, BASICS OF WEB DESIGN HTML5 & CSS, 2d ed., 1, 49 (Pearson 2014).

[108]    *Id.* at 286-87.

[109]    *Id*.

[110]    *Forms in HTML*, PENNSTATE ACCESSABILITY, *available at* http://perma.cc/R5XZ-BA9Q (last visited June 7, 2014).

Data tables are used for many purposes in legal research databases, both within the body of legal materials and in the structure of certain legal databases. For instance, LexisNexis and Westlaw use data tables when conveying certain Keycite and Shepard's information. Depending on the case keycited, these tables may contain a large amount of content. "Tables can be useful to organize information on a web page. . ." but for users "relying on assistive technology like a screen reader to read the table" they will "hear the contents of the table just the way it is coded – row by row, cell by cell. This might be difficult to understand. . . .For more complex tables the W3C recommends specifically associating the table data cell values with their corresponding headers. The technique that is recommended uses the id attribute (usually in a <th> tag) to identify a specific header cell and the headers attribute in a <dt> tag."[111]

Frames are a type of layout used on some websites which allow designers to "present documents in multiple views, which may be independent windows or subwindows. . .keep[ing] certain information visible, while other views are [] replaced."[112] Frames can present problems for assistive technology users, particularly if they fail to contain titles that describe the contents of each frame.[113]

Awareness of Visual Elements: Elements of a web page that are visual in nature, but add content, must be taken into account when designing a webpage, so that users with different levels of visual ability can all experience the content. Alt Tags "describe the content or function of images, image map hot-spots and animations," by adding language into the html code that a screen reader can access; a user that is visually impaired will be able to read a description of a graphical element.[114]

Using color as indicators is common practice in legal research databases.[115] Both Westlaw and Lexis Advance use color as indicators in their case validation services.[116] A picture of a yellow flag, for example, will be insufficient for a visually impaired user without additional information. The communication of this information may be through Alt Tags, heading structure, or indicators conveying whatever the color was seeking to express.[117] Highlighted terms in search results is another issue, as the highlighting may or may not be evident to the user when employing assistive technology.

Color is a concern for more than just users who are browsing the page without vision.[118] "One out of 20 people experiences some type of color

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[111]   TERRY FELKE-MORRIS, *supra* note 107 at 272-73.

[112]   *16 Frames*, W3C, http://perma.cc/GDU9-T5YD (last visited June 7, 2014).

[113]   Frames and iFrames, , PENNSTATE ACCESSABILITY, *available at* http://perma.cc/7TNG-VC54 (last visited June 7, 2014).

[114]   Stewart, Narendra, & Schmetzke, *supra* note 2 at 266.

[115]   *See generally, Keycite Status Flags*, WESTLAW, *available at* http://perma.cc/4PBS-EN3N (last viewed June 7, 2014); *see also*, *generally*, *Research Tip: Reading Shepard's Symbols*, LEXISNEXIS, *available at* http://perma.cc/VK2N-3NQJ (last viewed June 7, 2014).

[116]   Keycite Status Flags *supra* note 116; *Research Tip: Reading Shepard's Symbols*, supra note 116.

[117]   *Web Accessibility Checklist*, supra note 81.

[118]   TERRY FELKE-MORRIS, *supra* note 107, at 77.

perception deficiency."[119]  Users with low vision are likely to have difficulty when trying to read content where the text color does not contrast sufficiently with the background color.[120]  Users with low vision who use some visual cues will benefit from sufficient color contrast when browsing a site.[121]

Usable Format:  Ultimately, the goal of searching a legal research database is to locate material.  The ease of the search process holds little relevance if the end material is not usable to print-disabled individuals.  There are many formats in which WestlawNext and Lexis Advance deliver materials at the instruction of the user.  One of the most common download format options offered is portable document format (PDF).[122]  To be considered accessible, PDFs must be "tagged."[123]  Tagged PDF files were initially designed to create optimal viewing on mobile devices, but contain information that is important to users of assistive technology such as: reliable content access and extraction, ability to use information about content order, ability to use or ignore artifacts, ability to shrink or expand flow.[124]

Timed Responses:  While timed responses are not much of a concern most in legal research databases, it is important to note that in practice time spent in a legal research database may directly affect the bill.[125]  In fact, in Westlaw Classic and LexisNexis it was not uncommon for firms to be charged by the minute.[126]  In WestlawNext and Lexis Advance packages are charged at a flat rate for package selected with the possibility of additional charges for materials outside of the firm's plan users may be charged by the minute, the search, or the click depending on the firm's plan.[127]  An interface that is not user-friendly may result in unnecessary time, clicks, and searches, resulting in unfair costs to users of assistive technology.

Other:  Several additional issues were addressed in the checklist (see app. 1) but not fully discussed here.[128]  These issues did not apply to the specific tests performed in this study. For example, currently, legal research databases do not contain a lot of multimedia content.  In addition, flickering content has not been a concern in either Westlaw or LexisNexis as elements on the page are generally stationary once they appear.  AccessSTEM recommends using the W3C validator

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[119]   *Id.*

[120]   *Web Accessibility Checklist*, supra note 81.

[121]   TERRY FELKE-MORRIS, *supra* note 107, at 77.

[122]   *See* Jamal Mazrui, *What 's in a PDF?: The Challenges of the Popular Portable Document Format*, AFB ACCESSWORLD MAGAZINE, *available at* http://perma.cc/Z3KA-C5WT (last visited June 7, 2014); *see also*, *The Value of Tagged PDF*, PDF ASSOCIATION, (Oct. 14, 2011), *available at* http://perma.cc/X3P7-BK7N (last visited June 7, 2014).

[123]   *Web Accessibility Checklist*, supra note 81.

[124]   *The Value of Tagged PDF*, *supra* note 122.

[125]   *Cost Effective Legal Research*, CLEVELAND MARSHALL COLLEGE OF LAW LIBRARY (Apr. 28, 2014) *available at* http://perma.cc/FDJ7-YBL6.

[126]   *Commercial Plans*, WESTLAWNEXT, *available at* http://perma.cc/A38L-55WE (last visited June 7, 2014); *Lexis Advance Price Guide for Commercial Markets*, LEXIS ADVANCE, *available at* http://perma.cc/H67D-GXG5 (last visited June 7, 2014).

[127]   *Commercial Plans* supra note 126; *Lexis Advance Price Guide for Commercial Markets* supra note 126.

[128]   *Web Accessibility Checklist*, *supra* note 81.

for HTML validation.[129] The W3C Validator "checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc."[130] This is one of many tools available.[131] This process is complicated significantly due to the paywalls used by both Westlaw Next and Lexis Advance. The "Reports" function on the Accessibility Toolbar was used instead. This function assesses "the accessibility of all the elements on a page, reporting any that are inaccessible or potentially problematic. The Toolbar uses the qualifiers Pass, Fail, Warning, and Check to describe the accessibility of each element."[132]

## IV.    Findings

Both Westlaw and LexisNexis have improved their services to users with print disabilities significantly over the past decade.[133] In July of 2001 both LexisNexis and Westlaw claimed compliance with the Americans with Disabilities Act (ADA) and following the adoption of new federal regulation, both sites were revamped.[134] In 2002 both sites became "compatible with text-based browsers, screen readers (e.g., JAWS and Window-Eyes), Braille terminals and other adaptive devices, such as voice-recognition software."[135] Prior to the "revamp," users reported problems with images lacking Alt Tags, the use of color-only indicators, and a structure that occasionally caused a horizontal as opposed to a vertical browsing.[136] Since 2002, both databases have undergone another significant change in their interfaces, with Westlaw launching WestlawNext on February 1, 2010[137] and LexisNexis launching Lexis Advance on December 5, 2011.[138]

### a.    Westlaw

Westlaw's accessibility notice states: "West's web-based computer-assisted legal research service, complies with Section 508 of the Rehabilitation

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129    *Id*.
130    *W3C Markup Validation Service*, W3C (2012) *available at* http://perma.cc/3ZB-E8MC (last visited June 7, 2014).
131    *Id.*
132    *FAE Firefox Accessibility Evaluation Toolbar*, PENNSTATE ACCESSABILITY, *available at* http://perma.cc/52HC-G37A (last visited June 7, 2014).
133    Mary Rumsey, *Libraries Confront the Challenges of Accommodating Disabled Users*, AALL SPECTRUM (Apr. 2002), *available at* http://www.aallnet.org/main-menu/Publications/spectrum/Archives/Vol-6/pub_sp0204/pub-sp0204-confront.pdf.
134    *Id.*
135    *Id.*
136    *Id.*
137    Thomson Reuters, *Thomson Reuters Unveils WestlawNext, the Next Generation in Legal Research*, PR NEWSWIRE, (Feb. 1, 2010), *available at* http://perma.cc/RK7K-A.
138    *LexisNexis Launches New Release of Lexis Advance*, REED ELSEVIER, (Dec. 5, 2011) *available at* http://perma.cc/JGG7-WRMA.

Act of 1973, as well as the Priority 1 checkpoints[139] from the W3C's Web Content Accessibility Guidelines 1.0." In addition, Westlaw claims to be compatible with "[t]ext-based browsers, screen readers (such as JAWS and Window-Eyes), Braille terminals and other adaptive devices."[140] The website states that "[i]n accordance with Section 508, West's products and services are designed to comply with the applicable accessibility standards to the maximum extent practicable."[141] Westlaw offers three distinct options for browsing: WestlawNext, Westlaw Text Only, and WestlawNext Mobile. These options are available both to sighted users and users with print disabilities. Each interface has advantages and disadvantages for users of assistive technology.

Initially a significant difficulty arose getting when trying to contact customer service staff at Westlaw that were knowledgeable about product accessibility and usability. When Westlaw Text Only was first launched, press statements indicated that a specific department that worked to answer questions related to Westlaw Text Only and accepted user feedback.[142] From all indications it dissolved sometime after the interface was adopted. There are individuals at Westlaw who are knowledgeable on accessibility issues, yet finding these resources was challenging and time consuming. [143] In April, a reference attorney indicated that there were some reference attorneys who responded to accessibility issues and technical support familiar with accessibility programs but could not provide one location where users could get connected to these resources.[144] Recently, however, Westlaw added a Reference Attorney Assistive Technology Help Line that that can be reached at 1-800-418-9378 extension 43645 that is available Monday to Friday 7AM to Midnight.[145] This service was created to "assist users with specific questions related to assistive technologies and adaptive software, such as screen readers and voice recognition software."[146] Users can schedule trainings or obtain assistive technology specific product support.[147] Ideally, this central location of information will improve service to users of assistive technology.

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[139] Thomson Reuters, *Accessibility Notice*, WESTLAW WATCH, (2014) *available at* http://perma.cc/92C5-6TJT (last visited June 7, 2014).

[140] *Id.*

[141] *Id.*

[142] *West Group Introduces Westlaw Text Only; New User Interface Improves Westlaw Access for Users of Assistive Technology*, PR NEWSWIRE, (May 22, 2002), *available at* http://perma.cc/NWG6-A4A8 (last viewed June 7, 2014).

[143] E-mails with Reference Attorney Dated Mar. 31, 2014 – Apr. 2, 2014 (On File with Author).

[144] E-mails with Reference Attorney Dated Mar. 31, 2014 – Apr. 2, 2014 (On File with Author).

[145] *Accessibility*, WESTLAW NEXT, *available at* http://perma.cc/VU5N-KYWP (last visited June 7, 2014).

[146] See *Id.*, *see also*, Telephone Interview with Reference Attorney, Westlaw (June 7, 2014).

[147] *See Accessibility*, WESTLAW NEXT, *available at* http://perma.cc/VU5N-KYWP. (last visited June 7, 2014).

### i.   WestlawNext Main Site

Ability to Navigate: WestlawNext had some beneficial features, however there were areas where its design presented a serious impediment to navigating with a keyboard.  Each page contained skip navigation, and the skip navigation in Westlaw was especially useful because it skipped to the main content rather than skipping to the search box. Some pages in Westlaw even appear to have two skip navigation links.  Some users may find this feature convenient.  The option to skip to the main search bar with a second skip navigation link that allowed users to skip to main content would cut down on the fixed navigational content that users must traverse on each page.

Several features aided a print-disabled individual's ability to access website content, but there were areas that could use improvement. Testing revealed that a user could navigate entirely by keyboard but the process was extremely protracted due to the sheer amount of content on each page.  In some instances, text was read repetitively which made browsing more time-consuming, especially on pages with a lot of checkboxes, for example, browsing the Popular Names Table or Federal Materials took a large amount of time because .

Certain menus were difficult to open with keyboard navigation. Windows, which open in front of other content, can be hard to navigate.  A user can get stuck behind a pop up window and not realize that there is something in front of the content that has keyboard focus.  On at least two occasions in testing, the end of a document was reached before moving to a navigation bar on the right or left side.  If a screenreader user was browsing exclusively, they might not know that panel was present, especially if the user was browsing vertically.  Focus was occasionally bumped back to the top of pages after selecting content and the user was forced to move past the navigational content again.

Cues to Structure: Almost all the pages in Westlaw have headings that allow users to navigate more easily when using a screen reader.  There were also a number of impediments to making optimal use of the WestlawNext site.  The headings, while present, were in an incorrect order on 83.3% of the pages tested. Nine pages contained empty headings that appear to be used for visual rather than structural purposes.  Five pages contained either multiple uses of the tag heading one (<h1>) or no <h1> at all.  Both conditions are incorrect.  Further, some of the pages contained headings with labels that would not be helpful in orienting users, and there were several pages that would have benefitted from internal headings and had either limited or no headings in the main content field.

Useful Labeling of Design Elements: While many links were labeled, there were a number of errors where generic labels were used.  For example, WestlawNext used the following labels: "learn more," "click here," "link," "link" followed by a number, "more info," "main detail," "open detail level menu," and links containing only numerical labels. Some links have long tags especially where link labels contain full citations.  Several pages had so many links that the pages were difficult to browse.

Most of the form elements were correctly labeled.  Only two orphaned forms came up in the course of the research, and one form element was not

enclosed in a set. Though labels were used, some of them were so long that they were cumbersome to navigate.  Overall, these errors were minor.  There were not many data tables so this issue only came up occasionally.

Though, there were a few problems. For example, the drop down calendar presented serious navigation problems.  Some tables could have been better marked to make clear what content pertained to each column and row.  In Keycite the "Table of Authorities" and "Citing References" tables both worked nicely with the screen reader.

Awareness of Visual Elements:  Images contained Alt Text including symbols used repeatedly such as: keycite flags, history, notes, saved folder, past viewed (binoculars), key and symbol images.  Many of the links are properly labeled with good target link descriptions.  Most form fields contain a label attribute that allows users to make full use of the checkboxes and to search using multiple resources in the same search. The pages behind the paywall do not use frames eliminating this potential barrier for screen reader users.

Citators present special challenges as the content is often displayed in complex maps and charts.  On WestlawNext, the pages devoted to Negative Treatment, Table of Authorities, and Citing References are easily navigable.  On the other hand, while the graphical history chart could be accessed with keyboard navigation, it was not structured to work well with the screen reader.

WestlawNext does a good job of avoiding color-only indicators, especially considering the importance of color in the KeyCite flag system.  The markup of these indicators was well executed and very clear.  The notable exceptions were the highlighting search results and highlighting in multiple colors for searches that are further narrowed.  Italics were used in a few places for emphasis without a cue to indicate that the text was of potentially increased importance.  In Graphical History View, color was used to denote importance but, as mentioned above, that's the least of the problems on the map page.  The color combinations on WestlawNext generated an average of 26.4% of color contrast errors per page.

Usable Format: WestlawNext offers users the option to download files in many formats including: Microsoft Word, Word Processor RTF, Portable Document Format, and Word Perfect.  Users also have choices regarding the layout of the content downloaded and the volume of materials included.  The PDF format offered by WestlawNext is not tagged, which is less than ideal for print-disabled users.

## ii.  Text Only

On May 22, 2002, Thomson Reuters released Westlaw Text Only, an interface designed specifically to function with screen-reading software in a way that eliminates a lot of the difficulty encountered when using the old Westlaw Classic site.[148]  Ross Doerr, a consultant for the New Hampshire Association for the Blind specializing in technology and accessibility, explained that "Westlaw

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[148]  *West Group Introduces Westlaw Text Only; New User Interface Improves Westlaw Access for Users of Assistive Technology*, *supra* note 142.

Text Only is an extremely well thought-out product for attorneys who are blind or visually impaired and have to use assistive technology in their daily practice of law. . .For attorneys or staff persons who have to use  screen readers or screen-enlarging programs, this product has done as much to  'level the field' as the current state of adaptive technology can achieve."[149]

In 2007 the American Federation for the Blind reported the response to Westlaw Text Only of one twenty-four year old law student from the University of Cincinnati College of Law who was experienced with Westlaw Text Only, "Westlaw. . .is particularly easy to navigate, T. J. said, because there is a text-only version of the site. It is also used by his law school for its online interactive system, TWEN (The West Education Network). . ."[150]

In many ways, Westlaw Text Only is useful even after the transition from Westlaw Classic to WestlawNext.  Westlaw Text Only contains all the same substantive material as WestlawNext and both are updated simultaneously so there is no lag time in updating materials.[151]  Users can also optimize their settings to meet their accessibility needs by changing the form of display and document delivery.[152]  In addition, several resources exist for students learning to use Westlaw Text Only including a book entitled *Using Westlaw: Text Only*, published in Braille in 2007, and a digital guide available free for download on the Thomson Reuters website.[153]

The downside to Westlaw Text Only, is that it has extremely limited capabilities when it comes to performing different types of searches, placing Westlaw Text Only users at a notable disadvantage.[154]  Several of WestlawNext's most useful features are not available through Westlaw Text Only, including: the ability to perform a platform wide search and the advanced search creator.[155] Westlaw Text Only is capable of performing only five research tasks: a database search "using either the terms and connectors or the natural language search method," finding a document by citation or a case by party name, checking a citation using keycite, using the Westlaw Directory,[156] and printing and delivering information once retrieved.[157]

Users of the Westlaw Text Only platform face the additional pressure of needing to know database identifiers or party names to perform meaningful

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[149]    *Id.*

[150]    Deborah Kendrick, *Staying On Course: Interviews with Students Who Are Blind*, AccessWorld Magazine vol. 8, no. 4, (Jul. 2007), *available at* http://perma.cc/446R-BJAG.

[151]    E-mails with Reference Attorney Dated Mar. 31, 2014 – Apr. 2, 2014 (On File with Author).

[152]    WESTLAW TEXT ONLY USER GUIDE, THOMSON REUTERS, 5 (2009) *available at* http://perma.cc/PRS2-7QUJ.

[153]    See *id.*; *see also*, USING WESTLAW: TEXT ONLY, OCLC WORLDCAT, http://perma.cc/8FGE-LWQL (last visited June 7, 2014).

[154]    Daniel F. Goldstein & Matthias Niska, *Why Digital Accessibility Matters to the Legal Profession — A Conversation with a Young Blind Attorney*, LAW PRACTICE TODAY, *available at* http://perma.cc/PB4U-8EJQ (last visited June 7, 2014).

[155]    WESTLAW TEXT ONLY USER GUIDE, supra note 152 at 1.

[156]    A. Blechner, *Westlaw Text Case Tutorial*, YOUTUBE, (May 9, 2014) *available at* https://www.youtube.com/watch?v=m7Hsob4aJ58.

[157]    WESTLAW TEXT ONLY USER GUIDE, supra note 152 at 1.

searches.  Though it is possible to navigate to content without prior knowledge using this interface, students raised in an age of Google style searching – with one search box and natural language techniques – are likely to consider this interface dated.  To experience firsthand the five searches performed in this study on Westlaw Text Only with the use of the VoiceOver see the tutorials created by this author.[158]

### iii.  Mobile Optimized Site

On May 24, 2010 WestlawNext launched WestlawNext Mobile, a mobile site designed to provide an optimal browsing experience on mobile devices.[159]  In addition to improving the experience for mobile users, the new interface can be used on a computer by going to the address http://m.next.westlaw.com rather than the general WestlawNext home page.[160]  This mobile site provides a much easier experience for users of assistive technology.[161]  "WestlawNext Mobile has fewer images and a less complicated design and is generally assistive technology friendly. Because the same content repository is used, content available via Mobile WestlawNext is updated at the same time as the same content on WestlawNext."[162]  WestlawNext Mobile provides several of the important WestlawNext features that are unavailable through Westlaw Text Only, most notably, the full site search bar.

WestlawNext Mobile presented the easiest and most user-friendly experience of all the interfaces tested.  The same searches that took a considerably longer time in WestlawNext could be performed more quickly and easily on Westlaw Mobile.  The days of separate mobile websites might well be drawing to a close as "responsive design" becomes more prevalent.[163]  Properly executed responsive design can "provide an optimal viewing experience and easy navigation for all users and thereby address some accessibility issues."[164]  The five searches performed in this study on Westlaw Mobile with the use of the VoiceOver software are available online.[165]

Congress.gov is one of these next generation websites using responsive design principles to display content optimally regardless of the device used to

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[158]   *See* A. Blechner, *Westlaw Text Only Tutorials*, USABILITY OF LEGAL RESEARCH TOOLS (May 13, 2014), *available at* http://usability-in-legal-research.blogspot.com/2014/05/westlaw-text-only-tutorials.html.

[159]   Thomson Reuters, *WestlawNext Now Optimized for Mobile Access*, WESTLAWNEXT PRESS ROOM, (May 24, 2010) *available at* http://perma.cc/A3DF-YEV9 (last viewed June 7, 2014).

[160]   *Id.*

[161]   Voluntary Product Accessibility Template (VPAT) for WestlawNext, on file with author.

[162]   *Id.*

[163]   Joshua Steimle, *Why Your Business Needs A Responsive Website Before 2014*, FORBES.COM, *available at* http://perma.cc/V9SD-973Z (June 7, 2014).

[164]   Kathy Wahlbin, *Accessible Responsive Design*, INTERACTIVE ACCESSIBILITY, (Nov. 7, 2013) *available at* http://perma.cc/6CAY-M9DL.

[165]   *See* A. Blechner, *Westlaw Mobile Tutorials*, USABILITY OF LEGAL RESEARCH TOOLS (May 13, 2014), *available at* http://usability-in-legal-research.blogspot.com/2014/05/westlaw-next-mobile-tutorials.html.

browse.[166] Thomson Reuters stated in a press release that they plan to "continue to enhance and improve upon the capabilities of WestlawNext to give legal professionals a better research experience, increased efficiency, and greater confidence in their legal research."[167]  Given this outlook, perhaps WestlawNext users can expect responsive design in future updates to Westlaw's interfaces?

### b.    Lexis Advance

On December 5, 2011 LexisNexis launched its new interface Lexis Advance.[168]  Lexis Advance's Corporate Responsibility Report states that "[i]n developing Lexis Advance we have aimed to be fully compliant with WCAG 2.0 requirements, the accessibility standard."[169] LexisNexis employed a software architect, to work with their development team to design a set of rules which would govern the content, search and display features of its interface as well as find and fix accessibility issues. [170]  The new rules created by LexisNexis requiring certain accessibility standards were instituted in 2011.[171]   Lexis has no Text Only alternative to their main interface.[172]

Customer Service at LexisNexis, did not appear equipped to answer basic accessibility questions, and there was general confusion regarding where a user with a question of this type should be routed.  When a LexisNexis staff field engineer was asked if there was a dedicated group of people, a department, or an individual that people with accessibility questions can contact if they run into difficulties, the response was that "[t]here isn't an official 'accessibility group.' However representatives from the product team, technical/testing, and UX together ensure guidelines are being followed." [173]  Though the Reed Elsevier website states that in 2011 there was, in fact, an Accessibility Working Group.[174] The contact information for these individuals is not readily available to students with questions as they learn the new technology.

### i.   Main Site

Ability to Navigate: On the Lexis Advance site there were some beneficial features as well as areas where web design presented a serious impediment to navigating with a screen reader.  In the testing all pages were navigable by keyboard but the process was time consuming due to the volume of content on

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[166]    New York Law School, *THOMAS & Congress.gov*, MENDICK MATTERS, (Mar. 4, 2014), *available at* http://perma.cc/C4GK-L5RL.

[167]    Thomson Reuters, *supra* note 159.

[168]    *LexisNexis Launches New Release of Lexis Advance*, BUSINESS WIRE, (Dec. 5, 2011) *available at* http://perma.cc/BWE4-7UMS.

[169]    Braun, supra note 55.

[170]    *Id.*

[171]    *Id.*

[172]    Neria Nebel, LexisNexis Staff Field Engineer, Apr. 4, 2014 (Email On File With Author).

[173]    *Id.*

[174]    Ted Gies, *Making the Published Work Accessible to Everyone*, REED ELSEVIER, *available at* http://perma.cc/XY63-ZKN5 (last visited June 7, 2014).

each page.  One major difficulty was that focus was occasionally bumped to the top or bottom of a page after selecting content, forcing the user to move past navigational content again.  This was especially difficult when using the "narrow" feature to limit search results. Each time a box was checked to narrow the search results it was necessary to start navigation over again.  The map function in Shepard's also presented a serious challenge when navigating by keyboard.

Skip navigation is present in Lexis Advance.  Yet, it brings the user directly into the search bar rather than the main content.  Even after using the skip navigation link the user still has to traverse all the navigational content underneath the search bar before reaching the main content.

Cues to Structure: Another positive design feature of Lexis Advance was the presence of headings on all pages.  In addition to using headings for the persistent content, Lexis Advance marked up a significant portion of the main content on pages.  This was a very helpful feature, which would allow a user to navigate within the main content using a screen reader's browsing tools.

While Lexis Advance had several positive characteristics, a number of headings were either absent or very poorly labeled, containing only form elements for descriptions.  In addition, headings were out of order on numerous pages, and in one case this resulted in the screen reader jumping back and forth between opposite sides of the page.

Useful Labeling of Design Elements: As mentioned above, it is often helpful for screen reader users to navigate a page by links. On Lexis Advance some pages had upwards of 1,000 links with hundreds improperly named.  The label "link 1" was used repeatedly.  There were also some labels that failed to make sense absent surrounding content, such as "expand/collapse."  Some links were labeled with the same language despite leading to separate locations.  For example, one page used the language "table of contents" repeatedly to describe different hyperlinks, but the destination of each hyperlink was a different table of contents each time rather than the same one.

Form fields were present and for the most part they functioned effectively. Occasionally there were errors on the pages tested where the form fields either lacked a label or were completely devoid of content.  This could prove distracting when using a screen reader to navigate the page. In addition, Lexis Advance uses almost no frames and the two frames on the log in page were both properly labeled.

Lexis Advance used several data tables. While some tables were well done in Lexis Advance, the majority proved problematic.  Large and complicated data tables presented a problem in more than one instance.  For example, in certain tables such as the "Table of Authorities" screen in Shepard's there were a different number of columns in the header row than there were in the rows that followed.  This resulted in difficulty determining what cells were contained under each column heading.

Awareness of Visual Elements:  Alt Tags were present on each page in Lexis Advance.  On one page containing a large number of footnotes, there were links within the page from the body of the document to the footnotes section. Symbols were used repeatedly to visually cue users that clicking the link would

take them back and forth between the in text link and the footnotes section. This symbol appeared repeatedly and each time it was used (which numbered several hundred) its purpose was not indicated.

Lexis Advance avoided color-only indicators almost entirely. Highlighted text in Lexis Advance was indicated, as it required an extra command to proceed on to that text. One benefit to this was that it was clear that the highlighted text was different. Conversely, keystrokes were necessary to access the text and some paragraphs were broken up awkwardly, especially when search terms appeared multiple times in a short body of text. Another minor issue arose when browsing sources; font color was used to indicate what content was and wasn't available to the user. The difference in link status was not indicated outside of font color. The color combinations on Lexis Advance generated an average of 34.5% of color contrast errors per page.

Usable Format: Lexis Advance offers users the option to download files in many formats including: Portable Document Format, Word Microsoft Office Open XML, and LexisNexis CaseMap. Users also have choices of how to customize the layout of the downloaded content and the volume of materials included. The PDF format offered by Lexis Advance is not a tagged, which is less than ideal for print-disabled users.

### ii. Mobile Optimized Site

When LexisNexis launched the Lexis Advance interface in 2011, it also provided users with a mobile browsing option at https://advance.lexis.com/mobile.[175] Lexis Advance Mobile can be beneficial for users navigating with a screen reader as there is significantly less content on each page.

While there were certainly advantages to using the Lexis Advance Mobile site, there were also some serious drawbacks. The menu function in Lexis Advance Mobile contained links to important features such as Shepard's, document delivery, folders, and search history.[176] But, there were several problems accessing the menu with keyboard navigation. For example, the menu could not be accessed until after the user navigated all the navigation and main content on the entire page. [177] It was possible to find workarounds to speed up access to the menu bar, but the process was complicated and time consuming.[178] In addition, after selecting an item in the menu bar the screen reader continued to navigate the menu bar even after it closed was and no longer visible on the page.[179]

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[175]  *LexisNexis Launches New Release of Lexis Advance*, *supra* note 168.

[176]  A. Blechner, *LM Case Tutorial*, GOOGLE DRIVE, *available at* http://tinyurl.com/lj7rxrt (last visited May 10, 2014)

[177]  *Id.*

[178]  *Id.*

[179]  A. Blechner, *Lexis Mobile Regulation Tutorial*, YOUTUBE, (May 6, 2014) *available at* https://www.youtube.com/watch?v=3KG0XE44SEY.

The five searches performed in this study on Lexis Advance Mobile with the use of the VoiceOver software are available online.[180] As discussed above, responsive design may well take the place of separate mobile interfaces.[181] It is equally unclear whether LexisNexis plans to pursue an interface that uses responsive design principles at any point in the future.[182]

## V. Pros & Cons

Daniel F. Goldstein, a partner at Brown, Goldstein & Levy and counsel for the National Federation of the Blind, summed up the issues with Westlaw and LexisNexis well:

> While the two main legal research websites, Westlaw and Lexis-Nexis, are accessible to screen readers, I feel that both sites could be easier to use. For example, a screen-reader user must learn a rather lengthy list of tricks and work-arounds to use the ordinary versions of both sites efficiently. Westlaw also offers a text-only version of its site that is specifically designed for screen-readers, but I have found that the text-only site's excellent screen-reader compatibility and ease of use comes with a significant trade-off, as many of the tools and features available on Westlaw Classic and Westlaw Next are unavailable on Westlaw's text-only site.[183]

The findings from these tests confirmed the opinions Attorney Goldstein expressed in his interview.[184] Though both sites are technically accessible there is room for improvement in the usability of both main sites.

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[180] *See* A. Blechner, *Lexis Advance Mobile Tutorials*, USABILITY OF LEGAL RESEARCH TOOLS (May 13, 2014), *available at http://usability-in-legal-research.blogspot.com/2014/05/lexis-advance-mobile-tutorials.html.*

[181] See *infra* notes 163-167 and accompanying text.

[182] *Id.*

[183] Daniel F. Goldstein & Matthias Niska, *Why Digital Accessibility Matters to the Legal Profession — A Conversation with a Young Blind Attorney*, LAW PRACTICE TODAY, *available at* http://perma.cc/LDG6-Y58C (last visited June 7, 2014).

[184] *See generally*, *id*.

**Table 1: Usability Summary of Tasks Performed**

| | WestlawNext | Westlaw Text Only | WestlawNext Mobile | Lexis Advance | Lexis Advance Mobile |
|---|---|---|---|---|---|
| **Finding and filtering "Personal Jurisdiction" in CJS/Am Jur** | ★★ | ★ | ★★★ | ★ | ★★ |
| **Browsing to find the Americans with Disabilities Act** | ★ | ★★★ | ★★ | ★ | ★★ |
| **Advanced search for environmental regulation on black liquor** | ★ | ★★ | ★★★ | ★ | ★★ |
| **Search for *Campbell v. Acuff Rose Music Inc* by keyword** | ★★ | ★★ | ★★★ | ★★ | ★ |
| **Keyciting/Shepardizing *Campbell v. Acuff Rose Music Inc*** | ★★ | ★★★ | ★★★ | ★ | ★★ |

Key

| | |
|---|---|
| ★★★ | User Friendly |
| ★★ | Usable with Some Challenges |
| ★ | Challenging to Use |

**Table 2: Usability Summary based on Accessibility Criteria**

| | WestlawNext | Westlaw Text Only | WestlawNext Mobile | Lexis Advance | Lexis Advance Mobile |
|---|---|---|---|---|---|
| **Ability to Navigate** | ★ | ★★★ | ★★★ | ★ | ★ |
| **Cues to Structure** | ★ | ★★★ | ★★★ | ★ | ★ |
| **Useful Labeling of Design Elements** | ★★ | ★★★ | ★★★ | ★★ | ★★ |
| **Awareness of Visual Elements** | ★★ | ★★★ | ★★★ | ★★ | ★★ |
| **Usable Format** | ★★ | ★★ | ★★ | ★★ | ★★ |

Key

| | |
|---|---|
| ★★★ | Easy and Quick to Search/Retrieve Result |
| ★★ | Can Search/Retrieve Result, but Time Consuming or Labor Intensive |
| ★ | Challenging to Search and Retrieve Result |

In the basic tests, Lexis Advance and WestlawNext's main sites each had advantages and disadvantages when it came to usability. The browsing experience was roughly the same on both interfaces. It was possible to perform legal research with a screen reader, but it was labor intensive. Both WestlawNext and Lexis Advance offer mobile versions of their websites. Based on the tests performed Westlaw Mobile was easier to navigate and provided a better overall experience than Lexis Advance Mobile.

Another significant difference between the services was that Westlaw offered alternative interfaces users could choose from. In response to a question regarding whether Lexis Advance had a Text Only Interface, a LexisNexis Staff Field Engineer explained "[t]here is no text only alternative. We strive to ensure that Lexis Advance meets and passes all accessibility requirements based on WCAG 2.0 AA, to meet all accessibility needs and not only screen readers. Text only versions of sites are a thing of the past and should NOT be considered a viable accessibility solution."[185] This is a refrain of a common and oftentimes beneficial argument that "[a]lternative versions of web sites tend to get out of

date, no longer being maintained, and creating and maintaining them is more expensive than properly applying markup and learning the web accessibility skill properly once."[186]

Full accessibility of the main product is a valid objective. However, if the main site is cumbersome to navigate - like Lexis Advance and WestlawNext's primary interfaces can be at times - then the user experience will suffer. Further, because these services are databases and

it's only the interface that differs, the content would still be updated at the same time for all interfaces, negating some of the concerns regarding dated text only alternatives. With all the advantages of Westlaw Mobile, Westlaw Text Only is likely to see less use from patrons with screen readers who are aware of their other options, so this may be of less importance.

## VI. Looking Forward

### a. Additional Research to be Done

Usability of legal research tools for patrons with print disabilities is an area that has been largely left unexplored. One reason is the presence of a paywall making HTML validation extremely difficult using currently available tools. Thus, legal research databases must proactively seek such testing, or users who already have access must perform any testing that they hope to complete once behind the paywall. Understandably this field has seen little study.

Law librarians at academic institutions who receive flat rate access to legal research databases are in a unique position to evaluate the usability of the databases they, and their patrons, rely on. The elimination of cost constraints, the background knowledge of multiple research strategies, and an ethical commitment

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[185] Neria Nebel, LexisNexis Staff Field Engineer, Apr. 4, 2014 (Email On File With Author).

[186] Marco, *Why Screen Reader Detection is a Bad Thing*, MARCO'S ACCESSIBILITY BLOG, (Feb. 27, 2014), *available at* http://perma.cc/AS6K-2BY7 (last visited June 7, 2014).

to increasing access to legal materials makes law librarians ideal candidates for accessibility testing. Broader testing of Westlaw and LexisNexis as well as testing other common research databases such as Bloomberg, HeinOnline, Legal Trac, Proquest, and CCH, among others, would empower librarians to make informed choices and remove some of the mystery surrounding this issue.

Beyond simply testing websites, additional work assessing the usability of legal research tools for patrons on different platforms with print-disabilities would be useful. For example, e-Readers and tablets are becoming an increasingly common tool, especially among users with disabilities. Research into the new mobile apps available to assist in legal research would be useful in helping law librarians point interested users toward an appropriate platform for their research.

### b. What Can Law Librarians Do Individually and as a Community?

Librarians are uniquely situated to help patrons with print disabilities, particularly law students. Law librarians can provide information to the public without requiring patrons to self-identify. They tend to be actively involved in negotiating contracts with legal research services, and have flat fee access to legal research databases.

### i. Provide Information to Patrons Unsolicited

Librarians with knowledge about the accessibility of the databases, could provide information to patrons in a number of formats. This would serve both patrons who are interested in self-identifying and patrons who would rather their status remain private. For example, when including information about Westlaw on the library's website, a librarian looking to help can include a note about the usability benefits of Westlaw Mobile, reaching both students with disabilities and those without. By providing usability information on the different products the library licenses all patrons get a sense of whether a database is simple or complicated to use, and at the same time, users of assistive technology are directed to the most user-friendly interfaces to perform their research. In addition, when presented with patrons who expressly ask about accessibility or usability, some knowledge of the library's available resources is likely to make patrons feel welcomed and included in the library.

### ii. Negotiate Accessibility and Usability into License Agreements

When it comes to negotiating licensing contracts and selecting new content for the library, law librarians can be proactive in negotiating contract terms.[187] Here are a few initial thoughts on what librarians might consider advocating for to improve usability of library services.

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[187] Alford, *supra* note 4.

Before selecting new databases law librarians should ask critical questions about the product's usability. Many companies prepare a document called a Voluntary Product Accessibility Template.[188] "VPATs assist procurement officials in making preliminary assessments regarding the availability of commercial, electronic information products by highlighting features that support the Section 508 accessibility criteria."[189] Some products such as HeinOnline and BloombergBNA publicly release their VPATs.[190] Others, like Westlaw and LexisNexis maintain them as internal documents, which are challenging to procure.[191] Karl Groves, an Accessibility Consultant explained that the problem with VPATs submitted "by vendors [is that they] are often laughably bad and tend to be subject to ridicule in the 508 offices of government agencies. The bad information in them ranges from woefully inadequate to laughably uninformed to maddeningly false. Some VPAT submissions give the appearance of being filled out by someone in a hurry while others appear to be filled in by the marketing department."[192] If libraries were to ask for a VPAT created by a qualified, independent, third party,[193] prior to signing licensing contracts they would have a powerful tool to make more informed decisions.[194] This would also encourage vendors to fix usability problems once they are identified, resulting in better products.[195]

As mentioned earlier, libraries should require that licensing agreements minimum accessibility standards as a contract term.[196] This could be done with form language requiring that certain standards are met and requiring remediation should any future changes affect the agreed level of the product's usability.

In 2001 the IFLA released a set of licensing principles that it suggested "should prevail in the contractual relationship and written contracts between libraries and information providers."[197] Despite containing requirements of a "user friendly" interface for remote access and download in "multiple standard formats," the IFLA Licensing Principles fail to expressly include accessibility and

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[188] *VPAT Form*, U.S. DEPARTMENT OF STATE, *available at* http://perma.cc/6H2P-Y8BX (last visited June 7, 2014) (containing the actual form to be filled out).

[189] *Voluntary Product Accessibility Template (VPAT) Section 508 (Web products only)*, BLOOMBERGBNA *available at* http://perma.cc/YDY6-K9Y4 (last visited June 7, 2014).

[190] *Voluntary Product Accessibility Template*, HEINONLINE (May 4, 2003), *available at* http://perma.cc/GWB2-W4LR; *Voluntary Product Accessibility Template (VPAT) Section 508 (Web products only)*, BLOOMBERGBNA *available at* http://perma.cc/5NLM-P6QM.

[191] LexisNexis claims not to have completed one for Advance. Neria Nebel, LexisNexis Staff Field Engineer, Apr. 4, 2014 (Email On File With Author).

[192] Karl Groves, *Why A Third Party Should Prepare Your VPAT/GPAT*, KARL GROVES (Jul. 7, 2011), *available at* http://perma.cc/QQH9-JFMY.

[193] It is important to note that this measure would likely need to be taken by consortiums or law libraries en masse as vendors are unlikely to be willing to shell out the money for a consultant to perform such a test unless presented with a critical mass of demands.

[194] Karl Groves, supra note 192.

[195] *Id.*

[196] RLI *supra* note 34 at 17-18.

[197] *IFLA Licensing Principles (2001)*, IFLA, *available at* http://perma.cc/GLD7-BDLF (last visited June 7, 2014).

usability for individuals with print disabilities as a core value.[198]  In April of
2013, AALL released a Procurement Toolkit and Code of Best Practices for
Licensing Electronic Resources.[199]  The language states that "The license terms
should reflect any and all anticipated uses," yet the sample statement does not
expressly include print disabled users or users of assistive technology.[200]  Adding
a suggested provision requiring a minimum usability standard might be
appropriate.

Finally, law librarians should require the contact information for a single
individual or department within each legal research database's customer service
center who will be knowledgeable on accessibility.  Clearly distributing contact
information for a knowledgeable resource would be useful both for librarians
seeking more information about the product that they license and for users who
may run into difficulties using the products and need assistance.  A representative
that is readily available to talk a user through navigating an unfamiliar page with
assistive technology is an important resource for first year law students just
learning to do legal research.  In addition, these reps might be able to help users
choose the most beneficial interface (for example pointing a student toward
Westlaw Mobile for an easier browsing experience).

### iii.  Take a Resource for a Test Drive and Share Your Findings

With screen readers built into Apple products at no additional charge
(complete with a tutorial on how to use them) and free web accessibility software
patches for browsers, basic accessibility testing can be performed without
expense.  Law librarians generally have access to legal research databases that is
not charged by the minute or the click.  By taking advantage of this ability to get
behind the paywall and use legal research tools, librarians can perform
accessibility testing with the needs of their specific users in mind.   Sharing these
results within the library community would allow librarians considering new tools
to share information with their patrons and to make more informed choices about
what resources to acquire.  Just a few dedicated law librarians indulging their
natural curiosity about the electronic resources that are such a large portion of
library resources could make a huge difference.

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[198]    *Id.*

[199]    Executive Board, *Procurement Toolkit and Code of Best Practices for Licensing Electronic Resources*, AALL, *available at* http://perma.cc/HJE5-GVL3.
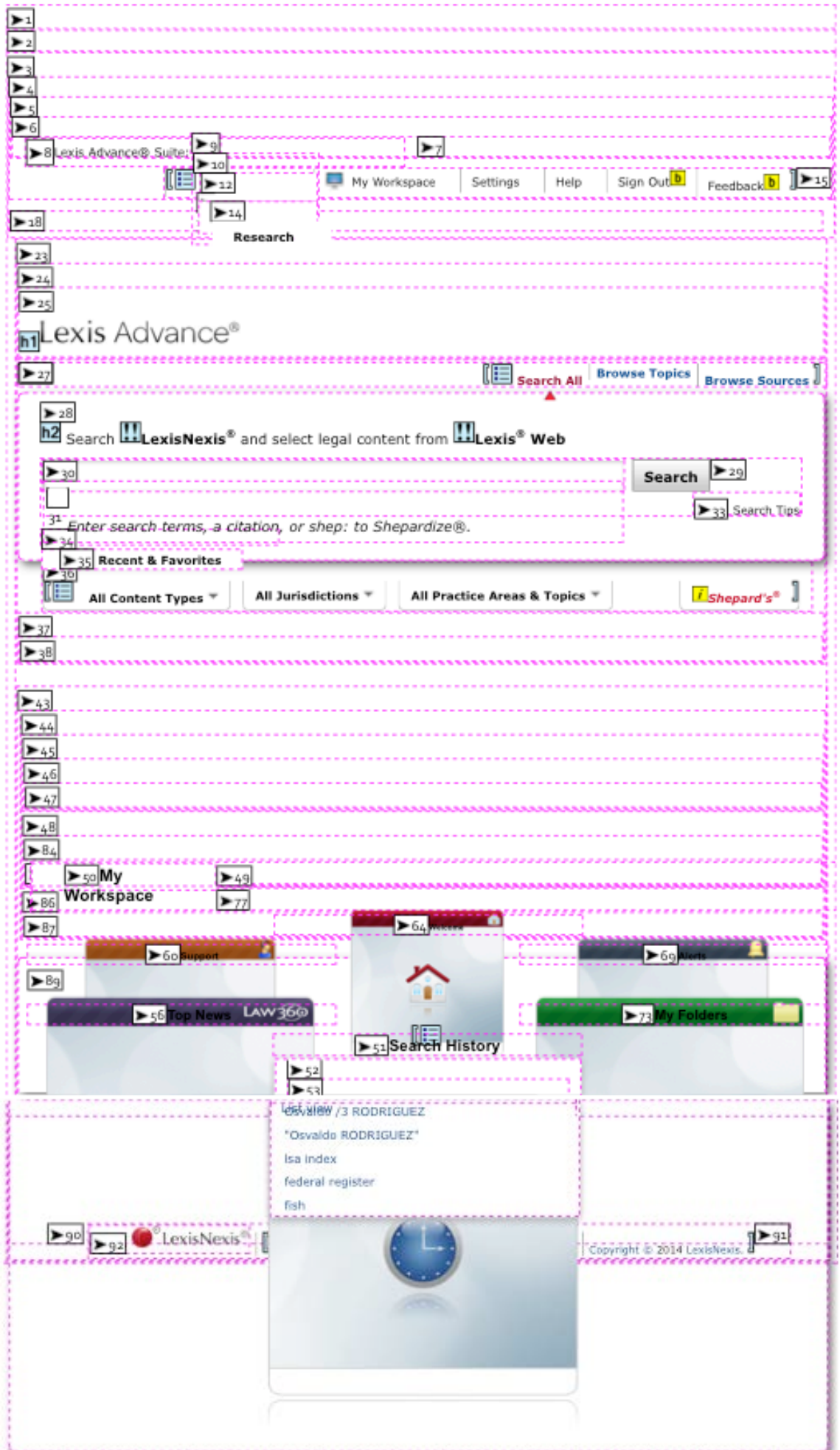
[200]    *Id.*

# APPENDIX 1

## Access STEM: *Web Accessibility Checklist*

1. Are Alt Tags present and sufficiently equivalent to the graphic content?
2. Does the page use structural elements such as headings effectively?
3. Can all links, navigational elements, and controls be accessed using the keyboard?
4. Does link text provide a reasonable description of the link target?
5. Are form elements explicitly associated with labels?
6. Are frames appropriately titled?
7. Is information in PDF available either as tagged PDF or in other more accessible formats?
8. Does the site avoid conveying meaning with color alone?
9. Is there sufficient contrast between text and background?
10. Are data tables marked up as required?
11. Is multimedia content captioned (or if audio only, transcribed)?
12. Is flickering content avoided?
13. Is the page functional when scripts are disabled?[201]
14. Is the page functional when style sheets are disabled?
15. If a page requires a timed response, can users request more time?
16. Does the page pass HTML validation?[202]

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[201] Note that concerns about Javascripts are relatively outdated and this is no longer regularly used for accessibility or usability testing purposes.

[202] *Web Accessibility Checklist*, Access STEM, *available at* http://perma.cc/TYY5-827M (last viewed June 7, 2014).

**L e x i s   A d v a n c e**

►1
►2
►3
►4
►5
►6
►8 Lexis Advance® Suite:  ►9  ►7
►10
►12   My Workspace   Settings   Help   Sign Out [b]   Feedback [b]  ►15
►14
**Research**
►18
►23
►24
►25

h1 Lexis Advance®

►27  Search All   Browse Topics   Browse Sources

►28
h2 Search LexisNexis® and select legal content from Lexis® Web

►30                                          Search  ►29

►33 Search Tips
31
►34  *Enter search terms, a citation, or shep: to Shepardize®.*
►35 **Recent & Favorites**
36
All Content Types ▼   All Jurisdictions ▼   All Practice Areas & Topics ▼   [i] Shepard's®

►37
►38
►43
►44
►45
►46
►47
►48
►84
►50 **My Workspace**  ►49
►86  ►77
►87
►64 Welcome
►60 Support
►89
►56 Top News  LAW360  ►69 Alerts
►73 **My Folders**
►51 **Search History**
►52
►53
overview /3 RODRIGUEZ
"Osvaldo RODRIGUEZ"
lsa index
federal register
fish

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# WestlawNext

**WestlawNext**

**h1** Browse

|  | **h2** | **h2** |
|---|---|---|
| | Federal Materials | State Materials |
| All Content **h2** | | |
| | Practice Areas **h2** | Tools **h2** |

Cases

Statutes & Court Rules

Regulations

Administrative Decisions & Guidance

Trial Court Orders

Secondary Sources

Forms

Briefs

Trial Court Documents

Expert Materials

Jury Verdicts & Settlements

Proposed & Enacted Legislation

Proposed & Adopted Regulations

Arbitration Materials

Practical Law

Public Records

Public Records (Classic)

Dockets

News

Business Law Center

Company Investigator

Sample Agreements

Legislative History

Trial Transcripts & Oral Arguments

Intellectual Property

International Materials

Directories

News and Insight from REUTERS

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REUTERS | 02/28/2014

Attorneys defending Jesse Litvak at the former trader's federal fraud trial accused the firm of firing him and then helping prosecutors out of concern that it might otherwise lose a major client.

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\*     Each pink box indicates an area where the user must use a keyboard stroke to move forward.  The numbers indicate the order in which content will be read aloud by the screen reading software.  Ideally the numbers should appear in a logical order.