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Not Just Key Numbers and Keywords  
Anymore: How User Interface Design  
Affects Legal Research

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## Not Just Key Numbers and Keywords Anymore: How User Interface Design Affects Legal Research\*

Julie M. Jones\*\*

*Legal research is one of the foundational skills for the practice of law. Yet law school graduates are frequently admitted to the bar without adequate competence in this area. Applying both information-foraging theory and current standards for optimal web design, Ms. Jones considers, through a heuristic analysis, whether the user interfaces of Westlaw and LexisNexis help or hinder the process of legal research and the development of effective research skills.*

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“There is regulation of behavior on the Internet and in cyberspace, [and] that regulation is imposed primarily through code.”<sup>1</sup>

### Introduction

¶1 The practical skills of law students and nascent lawyers are a consistent source of concern for our nation’s bar and legal academia.<sup>2</sup> Research and writing

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1. LAWRENCE LESSIG, CODE: VERSION 2.0, at 24 (2006).

2. See AM. BAR ASS’N SECTION OF LEGAL EDUC. & ADMISSIONS TO THE BAR, LEGAL EDUCATION

skills are the bread and butter of the newest members of the profession. Owing in part to ever-increasing starting salaries, more and more law firms expect (or hope) that their fresh hires will be able to conduct time- and cost-effective legal research with little expense or training by the firm itself. They are frequently disappointed.<sup>3</sup>

¶2 Law students do not typically arrive at law school with strong information skills.<sup>4</sup> They are frequently ill-prepared for the complexity and attention to detail required for efficient and successful legal research. Moreover, they often lack a basic familiarity with the most traditional research tools, i.e., indexes and tables of contents. Eschewing these for the one thing they know and love, keyword searching, they have frequently relied upon the “good enough” sources freely available on the Internet. The online legal research environment presents a strikingly different reality.

¶3 This reality has been analyzed at length. Scholars have considered the cost of legal publications and the effects of mergers in the publishing industry.<sup>5</sup> They have examined how people search within databases with the advent of keyword

AND PROFESSIONAL DEVELOPMENT—AN EDUCATIONAL CONTINUUM: REPORT OF THE TASK FORCE ON LAW SCHOOLS AND THE PROFESSION: NARROWING THE GAP (1992) (“MacCrate Report”); ROY STUCKEY ET AL., BEST PRACTICES FOR LEGAL EDUCATION (2007); WILLIAM M. SULLIVAN ET AL., EDUCATING LAWYERS (2007); Gene Koo, *New Skills, New Learning: Legal Education and the Promise of Technology* (Berkman Center for Internet & Society Research Pub’n No. 2007-4, 2007), available at <http://ssrn.com/abstract=976646>.

3. See, e.g., Jay Shuck, *When Associates Come in Green*, LAW LIBRARIANS IN THE NEW MILLENNIUM, Mar./Apr. 2007, at 7 (“We have had some horrendous bills because new associates were just looking around without direction,” observes one senior attorney.”); Tom Gaylord, 2007 Librarian Survey, slides 9, 11, 27 (PowerPoint presentation prepared for the Back to the Future of Legal Research Conference at Chicago-Kent College of Law, May 18, 2007), available at <http://www.kentlaw.edu/academics/lrw/future/handouts/gaylord%20-%20powerpoint.pdf> (librarians surveyed reported that more than 70% of new attorneys are unable to research effectively and efficiently prior to any in-house training, that almost 90% are unable to define or narrow issues with secondary sources, and they identify trends in the diminution of new attorneys’ ability to use tools such as indexes and digests and an “[e]ver-increasing reliance on electronic over print resources”); Sanford N. Greenberg, Attorney Survey 2007, slide 47 (PowerPoint presentation prepared for the Back to the Future of Legal Research Conference at Chicago-Kent College of Law, May 18, 2007), available at <http://www.kentlaw.edu/academics/lrw/future/handouts/greenberg%20-%20powerpoint.pdf> (“We frequently have to write off fee-based research costs because new lawyers don’t know how to use it efficiently.”). See also Sanford N. Greenberg, *Legal Research Training: Preparing Students for a Rapidly Changing Research Environment*, 13 J. LEGAL WRITING INST. 241 (2007).

4. Kathryn Hensiak et al., Abstract, *Assessing Information Literacy Among First-Year Law Students: A Survey to Measure Research Experiences and Perceptions*, 96 LAW LIBR. J. 867, 867, 2004 LAW LIBR. J. 54, ¶3 (“At the commencement of law study, these incoming law students face not simply the challenge of using legal research tools for the first time, but that of using any research tool.”); Ian Gallacher, “Who are Those Guys?”: *The Results of a Survey Studying the Information Literacy of Incoming Law Students* (July 31, 2007), available at <http://ssrn.com/abstract=1004088> (law students overestimate their general research skills, and their legal information literacy skills are inadequate).

5. See, e.g., Bob Berring, *Ring Dang Doo*, 1 GREEN BAG 2d 3 (1997); Mark J. McCabe, *Merging West and Thomson: Pro- or Anti-Competitive?*, 97 LAW LIBR. J. 423, 2005 LAW LIBR. J. 25; *Symposium of Law Publishers*, LEGAL REFERENCE SERVICES Q., 1991, No. 3/4, at 1–166; Susan M. Yoder, *The Rise of the Small: The Effects of Industry Consolidation on Small Legal Publishers*, LEGAL REFERENCE SERVICES Q., 1999, No. 1/2, at 59.

searching,<sup>6</sup> and the effects of online headnoting systems.<sup>7</sup> Few words, though, have been written on how the two dominant legal publishing companies, Westlaw and LexisNexis, may influence and control information-seeking behavior and legal research skills through the design of their user interfaces, i.e., through their code architecture.<sup>8</sup> That this might occur was predicted more than ten years ago:

West Group and LEXIS Law Publishing can change the behavior of legal researchers by changing the code architecture of their software. . . . Choices will be based largely on profit. Which architecture will be the most appealing to legal researchers and produce the most profit? . . . Code architecture constrains by channeling the research process and the behavior of the legal researcher. Code conditions the researcher's access to online data. It does this by facilitating certain actions and making others impossible.<sup>9</sup>

¶4 This article considers how information-foraging theory—the ways in which users gather information—can illuminate our understanding of the work lawyers do as researchers using subscription-based online tools.<sup>10</sup> It then examines how current standards in web design can be used to facilitate optimal navigation of web-based information sources. Combining these theoretical and practical approaches in a heuristic analysis<sup>11</sup> of the Westlaw and LexisNexis web interfaces, the article analyzes whether and how these companies may be affecting the legal research skills and behaviors of law students and new attorneys. Particular attention is given to the two methods of information seeking in an online environment: browsing and searching.

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6. See, e.g., Carol M. Bast & Ransford C. Pyle, *Legal Research in the Computer Age: A Paradigm Shift?*, 93 LAW LIBR. J. 285, 2001 LAW LIBR. J. 13; Barbara Bintliff, *From Creativity to Computerese: Thinking Like a Lawyer in the Computer Age*, 88 LAW LIBR. J. 338 (1996); David C. Blair & M.E. Maron, *An Evaluation of Retrieval Effectiveness for a Full-Text Document-Retrieval System*, 28 COMM. OF THE ACM 289 (1985); Daniel P. Dabney, *The Curse of Thamuz: An Analysis of Full-Text Legal Document Retrieval*, 78 LAW LIBR. J. 5 (1986); F. Allan Hanson, *From Key Numbers to Keywords: How Automation Has Transformed the Law*, 94 LAW LIBR. J. 563, 2002 LAW LIBR. J. 36.

7. See, e.g., Robert C. Berring, *Full-Text Databases and Legal Research: Backing into the Future*, 1 HIGH TECH. L.J. 27 (1986); Robert C. Berring, *Legal Information and the Search for Cognitive Authority*, 88 CAL. L. REV. 1673 (2000); Daniel Dabney, *The Universe of Thinkable Thoughts: Literary Warrant and West's Key Number System*, 99 LAW LIBR. J. 229, 2007 LAW LIBR. J. 14; Lee F. Peoples, *The Death of the Digest and the Pitfalls of Electronic Research: What is the Modern Legal Researcher to Do?*, 97 LAW LIBR. J. 661, 2005 LAW LIBR. J. 41.

8. Code architecture has been conceptualized in other contexts as choice architecture. See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 81–100 (2008) (analyzing the ways default settings, human inertia, and choice presentation affect human behavior in various aspects of life).

9. Bast & Pyle, *supra* note 6, at 300–01, ¶¶ 57–61.

10. While many librarians and mature attorneys bemoan the lack of use of secondary sources and indexes/digests by new attorneys, particularly in print, Westlaw and LexisNexis are moving more and more of those sources into the online environment. For this paper, I did not consider the efficiencies of print versus online research.

11. Heuristic evaluations of web sites apply recognized design principles (“heuristics”) to the target web site to identify potential problems or issues with the usability of the interface.

## Hunting and Gathering in the Information Wilderness

¶5 Information-foraging theory was developed to provide a better understanding of human information-gathering and sense-making strategies, analogizing from evolutionary-ecological explanations of food-foraging strategies.<sup>12</sup> “The basic hypothesis of information-foraging theory is that, when feasible, natural information systems evolve toward stable states that maximize gains of valuable information per unit cost.”<sup>13</sup> Where information is abundant, as it is for law students, access to more information is not the problem. Rather, the problem is the efficient allocation of attention to the right information: “What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.”<sup>14</sup>

¶6 Information foraging in this abundance is likened to animals foraging for food in the wild. Take, for example, the case of a bear.<sup>15</sup> It has many choices for food, some of which produce more benefits for less effort than others. It could snack for three hours in a nearby blackberry patch, receiving a nominal amount of calories, fat, and nutrition. This option requires little effort besides finding the berry patch, but the payoff may not be optimal. Alternatively, the bear could attempt to catch live prey. This may require a greater expenditure of effort in both locating and trapping the prey, but should yield a greater profit if successful. Different food sources will have different scents, locations, and navigation costs. Optimally, the meal would be both easy to catch and highly nutritious.

¶7 Similarly, an attorney must continually find “task-relevant information”<sup>16</sup> and often is charged with a “knowledge-crystallization task.”<sup>17</sup> That is, she must gather information for a specific purpose, make sense of it, and repackage it for some other purpose. She will have access to many different sources and types of information, in different formats, with different costs and benefits associated with each. Some sources will be easier while others are more difficult to use or access; some will be free and others may cost considerable sums of money; some sources may be in print or online, available at her desk or in the library on a different floor. The “optimal information forager” is the attorney who solves the task presented in the most resource-efficient manner, “maximizing the rate of valuable information gained per unit cost, given the constraints of the task environment.”<sup>18</sup>

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12. Peter Pirolli & Stuart Card, *Information Foraging*, 106 PSYCHOL. REV. 643 (1999).

13. *Id.* at 643. This assumes that the information provider does not benefit from inefficiencies, as subscription database providers that charge clients based on usage do. Or, perhaps the for-profit information environment should be considered an unnatural information system. In the for-profit information environment, companies may directly benefit from the inefficient use of their products, e.g., multiple poorly formed search queries in more expensive databases.

14. Herbert Simon, *Designing Organizations for an Information-Rich World*, in COMPUTERS, COMMUNICATIONS, AND THE PUBLIC INTEREST 37, 40–41 (Martin Greenberger ed., 1971).

15. This example is adapted from Pirolli & Card, *supra* note 12, at 645.

16. *Id.*

17. *Id.* at 647.

18. *Id.* at 645.

¶8 Like food, information often comes in patches or in concentrated bunches. For the lawyer, patches of information may be a treatise, a section of statutory code, a list of relevant cases, or the Shepard's or KeyCite report for a single case. At all times, the information forager must determine the amount of time and resources to be devoted to "between-patch foraging" versus "within-patch foraging."<sup>19</sup>

¶9 In the online legal environment, between-patch foraging can be loosely described as the process of selecting which database to search or browse, while within-patch foraging means navigating within the chosen database. Should I continue plowing through this search result of New York state and federal cases (within-patch), or expand my search to all state and federal cases (between-patch)? Should I use Focus or Locate to narrow my search results (within-patch), or start clicking on these headnote topics (between-patch)? Are the annotations to the code what I need (within-patch), or should I be looking in the CFR instead (between-patch)? Within-patch foraging is generally the simpler of the two, as the patch is a known quantity, though full-text search results can be large, difficult patches to navigate. Between-patch foraging strategies require considerably more energy and analysis, as the user must renegotiate access to a new information patch every time.<sup>20</sup>

¶10 In attempting to navigate through space (even virtual space) to find high-yield patches, animals and researchers alike rely on scent.<sup>21</sup> "Information scent is the (imperfect) perception of the value, cost, or access path of information sources obtained from proximal cues, such as bibliographic citations, WWW links, or icons representing the sources."<sup>22</sup> In the online environment, hypertext links are the most common example of a proximal cue that can possess a strong or weak scent, depending on the degree to which the linked words correspond to the forager's associations.<sup>23</sup> Scent is "based on our mental associations" between words and concepts.<sup>24</sup> It is thus individual to the sniffer to some degree, as people can vary in their associations.<sup>25</sup> "[T]he scent is in the 'nose' of the user."<sup>26</sup> If the scent is weak, the forager will likely not follow the path unless no better choices are available. If the scent is strong, the forager will follow it. If there is no scent, the forager will wander randomly or look elsewhere.<sup>27</sup> With perfect scent, the forager would make no wrong turns.<sup>28</sup> A strong scent that leads to a dead end causes the searcher to con-

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19. *Id.* at 646.

20. *See id.*

21. The concept was previously discussed as residue. *Id.* (citing G.W. Furnas, *Effective View Navigation*, 1997 CHI PROCEEDINGS OF THE HUMAN FACTORS IN COMPUTING SYSTEMS 367, 371).

22. *Id.*

23. S. Shyam Sundar et al., *News Cues: Information Scent and Cognitive Heuristics*, 58 J. AM. SOC'Y FOR INFO. SCI. & TECH. 366, 366 (2007).

24. Jason Withrow, *Do Your Links Stink? Techniques for Good Web Information Scent*, BULL. AM. SOC'Y FOR INFO. SCI. & TECH., June/July 2002, at 7, 7.

25. *Id.* at 8.

26. Marion Walton & Vera Vukovic, *Cultures, Literacy, and the Web: Dimensions of Information "Scent"*, INTERACTIONS, Mar./Apr. 2003, at 65, 71.

27. Pirolli & Card, *supra* note 12, at 646-47.

28. Peter Pirolli, *Rational Analyses of Information Foraging on the Web*, 29 COGNITIVE SCI. 343, 347 (2005).

clude that the information does not exist anywhere on the web site.<sup>29</sup> In web sites like Westlaw and LexisNexis, information scent is critical in helping attorneys and law students successfully complete their knowledge-crystallization tasks.

¶11 Information scent tracking is a browsing behavior. In the online environment users have two methods for finding information: browsing and searching, both of which have pros and cons.<sup>30</sup> Browsing can be inefficient because users must rely on proximal cues (scent). One wrong click and precious time is wasted.<sup>31</sup> On the other hand, browsing can serve as a useful tool to assist users in formulating searches, familiarizing themselves with a topic, and providing an improved vocabulary.<sup>32</sup> “[A] great deal of information and context [can be] obtained along the browsing path itself, not just at the final page.”<sup>33</sup>

¶12 Searching, on the other hand, tends to retrieve too many extraneous results, and results are frequently returned without context.<sup>34</sup> At the same time, searching can retrieve specific documents very quickly and efficiently, especially with informed search terms.<sup>35</sup> While both methods have their advantages and disadvantages, they complement each other when used in combination.<sup>36</sup> Nonetheless, “[s]tandard information access techniques tend to emphasize the search end of the spectrum.”<sup>37</sup>

¶13 In Westlaw and LexisNexis, searching and browsing are used at multiple stages in the information-seeking process. First, users must search or browse to select a database applicable to their task. Second, they must search or browse within a database to solve tasks. As will be discussed later in this article, both Westlaw and LexisNexis encourage browsing to find and select databases, and then encourage searching within databases. This allows Westlaw and LexisNexis, to their potential economic benefit, to steer users toward some databases and away from others, and to promote particular information-gathering behaviors within databases.<sup>38</sup>

29. Jakob Nielsen, *Deceivingly Strong Information Scent Costs Sales*, JAKOB NIELSEN'S ALERTBOX, Aug. 2, 2004, <http://www.useit.com/alertbox/20040802.html>.

30. See Douglass R. Cutting et al., *Scatter/Gather: A Cluster-based Approach to Browsing Large Document Collections*, 1992 PROCEEDINGS OF THE FIFTEENTH ANNUAL INTERNATIONAL ACM SIGIR CONFERENCE ON RESEARCH & DEVELOPMENT IN INFORMATION RETRIEVAL 318 (discussing document clustering algorithms); Christopher Olston & Ed H. Chi, *ScentTrails: Integrating Browsing and Searching on the Web*, 10 ACM TRANSACTIONS ON COMPUTER-HUM. INTERACTION 177 (2003) (the ScentTrails algorithm attempts to bring together the strengths of searching and browsing in a single user interface).

31. See Olston & Chi, *supra* note 30, at 178.

32. Cutting et al., *supra* note 30, at 319.

33. Olston & Chi, *supra* note 30, at 178.

34. See *id.*

35. See *id.*

36. *Id.*

37. Cutting et al., *supra* note 30, at 319.

38. Exact information cannot be given as to the price of any particular database as vendor contracts vary. However, as a general matter, searching large databases is more expensive than searching small databases, and browsing is less expensive than searching. According to 2006 information sheets (on file with author), Westlaw's ALLCASES database costs \$159 to search compared to \$52 for a single state case database. Similarly, TP-ALL (Texts and Periodicals) is priced at \$145 per search. Westlaw and LexisNexis both provide tables of contents for many publications that are arranged by subject, i.e., statutes, encyclopedias, and treatises. Browsing tables of contents and indexes is free on both

## Code Architecture

¶14 In addition to the task of interpreting links (discerning the strength of the information scent), foragers are also confronted with the problem of visually navigating the layout of each new web page. Each link is just one tree amidst a forest of words and graphics, or one scent in a cheese factory. It must be identified before it can be analyzed. If a link's placement on a web page makes it virtually invisible, its scent is irrelevant. According to the eye-tracking<sup>39</sup> firm Enquiro's president and CEO, Gord Hotchkiss, "[T]here's a huge importance placed on where the eyeballs end up on the page. Clicks happen pretty quickly. It just shows that [web design] is a real estate game. It's all about location, location, location."<sup>40</sup> Another web search consultancy company, Eyetools, has this telling slogan: "because people can't click on what they don't see."<sup>41</sup>

¶15 Well-designed web sites place the most important information at the top left, mid-left, and center of the screen,<sup>42</sup> though below any banner.<sup>43</sup> These are the most heavily viewed areas of web pages.<sup>44</sup> This pattern has been called by some the

Westlaw and LexisNexis to users with transactional accounts. Linking within these finding aids incurs a small "find fee" of \$6 for most primary law, law review articles, and news documents. The find fee for most secondary law is \$12 (Westlaw) or \$15 (LexisNexis). While Westlaw and LexisNexis pay no royalties to courts for use of their judicial decisions, the same cannot be said regarding authors who license their publications for online use.

39. The eye-tracking movement dates back to 1879 when researchers first considered how the human eye moved across a page of text or printed picture. See Keith Rayner, *Eye Movements in Reading and Information Processing: 20 Years of Research*, 124 PSYCHOL. BULL. 372, 372 (1998); see also Robert J.K. Jacob & Keith S. Karn, *Eye Tracking in Human-Computer Interaction and Usability Research: Ready to Deliver the Promises*, in THE MIND'S EYE: COGNITIVE AND APPLIED ASPECTS OF EYE MOVEMENT RESEARCH 573, 574 (J. Hyönä et al. eds., 2003). Eye tracking is currently used to determine where people look when they conduct computer searches and browse web sites. See, e.g., Joseph H. Goldberg et al., *Eye Tracking in Web Search Tasks: Design Implications*, 2002 SYMPOSIUM ON EYE TRACKING RESEARCH & APPLICATIONS 51; Laura Granka et al., *Location Location Location: Viewing Patterns on WWW Pages*, 2006 SYMPOSIUM ON EYE TRACKING RESEARCH & APPLICATIONS 43.

40. Eyetools, Eyetools, Enquiro, and Did-it Uncover Search's Golden Triangle, [http://www.eyetools.com/inpage/research\\_google\\_eyetracking\\_heatmap.htm](http://www.eyetools.com/inpage/research_google_eyetracking_heatmap.htm) (last visited Oct. 2, 2008).

41. *Id.*

42. U.S. DEP'T OF HEALTH & HUMAN SERVICES & U.S. GENERAL SERVICES ADMINISTRATION, RESEARCH-BASED WEB DESIGN & USABILITY GUIDELINES 47 (2006), available at [http://usability.gov/pdfs/guidelines\\_book.pdf](http://usability.gov/pdfs/guidelines_book.pdf) [hereinafter RESEARCH-BASED WEB DESIGN] ("All critical content and navigation options should be toward the top of the page."); Granka et al., *supra* note 39, at 43 ("[T]he top left, mid-left and center were the top three regions where users first fixated."). See also Will Schroeder, *Testing Web Sites with Eye-Tracking*, USER INTERFACE ENGINEERING, Sept. 1, 1998, [http://www.uie.com/articles/eye\\_tracking/share](http://www.uie.com/articles/eye_tracking/share) (users typically look center, left, then right).

43. See, e.g., Moira Burke et al., *High-Cost Banner Blindness: Ads Increase Perceived Workload, Hinder Visual Search, and Are Forgotten*, 12 ACM TRANSACTIONS ON COMPUTER-HUM. INTERACTION 423, 423 (2005) ("people rarely look directly at banners"); Magnus Pagendarm & Heike Schaumburg, *Why Are Users Banner-Blind? The Impact of Navigation Style on the Perception of Web Banners*, 2 J. DIGITAL INFO. (2001), <http://journals.tdl.org/jodi/article/view/jodi-37/38> (goal-directed researchers more banner-blind than aimless browsers).

44. See, e.g., Goldberg et al., *supra* note 39, at 51 (emphasizing need for critical site navigation to be placed at left and top of screen); Steve Outing & Laura Ruel, *The Best of Eyetrack III: What We Saw When We Looked Through their Eyes*, <http://poynterextra.org/eyetrack2004/main.htm> (last visited Oct. 2, 2008) (on news sites, users typically fixated first in upper left, then left to right and down). See also note 43.

“F-Shape”<sup>45</sup> or “Golden Triangle,”<sup>46</sup> as computer-generated scan path<sup>47</sup> images illustrate these descriptors quite literally. Participants’ eyes<sup>48</sup> moved along these patterns most frequently, and eye fixations<sup>49</sup> remained in these areas for the longest periods of time.<sup>50</sup>

¶16 While some areas of a page are consistently viewed, others are given significantly less attention by users. The right side of the screen is less frequently fixated and typically viewed last or second to last.<sup>51</sup> Additionally, any information that resides “below the fold,” i.e., requires scrolling to view, is less likely to be seen.<sup>52</sup> When seen, it is given a cursory scan.<sup>53</sup> Some users are scroll-averse.<sup>54</sup> Where it appears that content ends above the fold, e.g., a paragraph ends and the beginning of the next paragraph is not visible, or there is a line with nothing visible below it, users typically will not scroll.<sup>55</sup> While scroll bars do indicate content below the fold, most users do not fixate on the scroll bars and simply register their presence when needed, using peripheral vision.<sup>56</sup>

45. Jakob Nielsen, *F-Shaped Pattern for Reading Web Content*, JAKOB NIELSEN’S ALERTBOX, Apr. 17, 2006, [http://www.useit.com/alertbox/reading\\_pattern.html](http://www.useit.com/alertbox/reading_pattern.html) (using three different types of web pages (Internet search results, product page, and organization home page), users typically scanned left to right across top, down the left a little and across the middle a shorter distance than across top, then down the left side).

46. Eyetools, *supra* note 40 (viewing search results, users’ eye scans form a triangle focused at top left, across to right, and down the left side of the screen).

47. Scan paths are the routes the eyes take when considering a page as a whole. See Rayner, *supra* note 39, at 399 (citing D. Noton & L.W. Stark, *Scanpaths in Eye Movements During Pattern Perception*, 171 SCIENCE 308 (1971)). On regularly visited web sites, the eye may form habitual scan paths. See Sheree Josephson & Michael E. Holmes, *Visual Attention to Repeated Internet Images: Testing the Scanpath Theory on the World Wide Web*, 2002 SYMPOSIUM ON EYE TRACKING RESEARCH & APPLICATIONS 43, 48 (“eye movements may follow . . . habitually preferred path[s],” though acknowledging that further research is needed); Yoshiko Habuchi et al., *The Influence of Web Browsing Experience on Web-Viewing Behavior*, 2006 SYMPOSIUM ON EYE TRACKING RESEARCH & APPLICATIONS 47 (“[R]esults suggest that prior Web-browsing experiences form an individual’s efficient tracking method or mental model of how to view a Web site to get information.”); Brian D. Ehret, *Learning Where to Look: Location Learning in Graphical User Interfaces*, 2002 PROCEEDINGS OF THE SIGCHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS 211, 218 (people learn link locations in a graphical user interface “and can use this location knowledge to improve task performance”).

48. The human eye moves incredibly quickly. These movements, or saccades, sometimes approach velocities of 500 degrees per second. No information is processed by the mind during saccades. Rayner, *supra* note 39, at 373.

49. When the eye rests and focuses on an item, or fixates, information acquisition and processing occur. Fixations typically last at least 200–300 milliseconds. *Id.* at 373, 378.

50. Outing & Ruel, *supra* note 44.

51. See Granka et al., *supra* note 39, at 43; Schroeder, *supra* note 42; Eyetools, *supra* note 40, Nielsen, *supra* note 45; RESEARCH-BASED WEB DESIGN, *supra* note 42, at 47 (although right bar navigation has been effective in some tests).

52. RESEARCH-BASED WEB DESIGN, *supra* note 42, at 66 (some users consider the bottom of a screen the end of a web page); Outing & Ruel, *supra* note 44.

53. Outing & Ruel, *supra* note 44.

54. Walton & Vukovic, *supra* note 26, at 67 (novice Internet users do not know that scrolling is possible or that information may exist beyond the screen viewed). See also Schroeder, *supra* note 42 (to users, the “fold” is actually about two-thirds down the page, not at the very bottom).

55. RESEARCH-BASED WEB DESIGN, *supra* note 42, at 53.

56. Schroeder, *supra* note 42.

¶17 Navigation aids should be designed to help users accomplish tasks efficiently and quickly.<sup>57</sup> Horizontal navigation at the top of the page performs somewhat better than vertical navigation on the left or right, though left bar navigation also performs well.<sup>58</sup> The meaning of navigation labels in tabs must be clear and obvious, providing a strong information scent for the user.<sup>59</sup> Organizations sometimes create unfamiliar acronyms or weakly associated labels for their navigation that hinder efficient use of their sites.<sup>60</sup> Horizontal links located above the primary screen space in the banner are less frequently fixated or clicked by users.<sup>61</sup> Westlaw and LexisNexis both use a combination of tabs, category directories, and links within a top banner area for their navigation.

¶18 Users typically don't read on the web, they scan.<sup>62</sup> Visual navigation of a page is significantly improved with lists that are formatted for easy scanning,<sup>63</sup> i.e., vertical, bulleted, and aligned.<sup>64</sup> Lists should be arranged in meaningful order, such as by importance, popularity, or alphabetical,<sup>65</sup> with similar items grouped together.<sup>66</sup> Link lists should be short,<sup>67</sup> with obvious meaning.<sup>68</sup>

¶19 Many web sites feature images or graphic elements.<sup>69</sup> Typically, larger images receive more fixations for longer periods of time than smaller images.<sup>70</sup> While larger images result in more fixations for longer durations, they do not nec-

57. JAKOB NIELSEN & MARIE TAHIR, *HOMEPAGE USABILITY: 50 WEB SITES DECONSTRUCTED* 19 (2002) ("users [should] be able to find the appropriate navigation area effortlessly, differentiate between the choices, and have a good sense of what lies beneath the links."); RESEARCH-BASED WEB DESIGN, *supra* note 42, at 58.

58. NIELSEN & TAHIR, *supra* note 57, at 43 (left bar navigation and tabs favored).

59. RESEARCH-BASED WEB DESIGN, *supra* note 42, at 64, 86.

60. *Id.*; NIELSEN & TAHIR, *supra* note 57, at 19.

61. NIELSEN & TAHIR, *supra* note 57, at 19 ("users often ignore anything within or above a rectangular shape at the top of the screen," also known as banner blindness).

62. Jakob Nielsen, *How Users Read on the Web*, JAKOB NIELSEN'S ALERTBOX, Oct. 1, 1997, <http://www.useit.com/alertbox/9710a.html> (79% of those tested scanned, while 16% read). In determining where to look next, the eye uses what is called parafoveal vision, which includes five degrees of viewing area where no reading or comprehension occurs, but the eye determines where to proceed next and whether nearby words can be skipped. Many words are skipped using parafoveal vision analysis. Two- to three-letter words are fixated only 25% of the time, whereas eight- or more-letter words are fixated 100% of the time. Rayner, *supra* note 40, at 375. With lawyers conducting much of their research online, one wonders what effect this fact alone has on legal research skills, let alone jurisprudence. See also Debra Moss Curtis & Judith R. Karp, *In a Case, On the Screen, Do They Remember What They've Seen? Critical Electronic Reading in the Law Classroom*, 30 *HAMLIN L. REV.* 247 (2007).

63. RESEARCH-BASED WEB DESIGN, *supra* note 42, at 114.

64. *Id.* at 115 (horizontal lists take 20% longer to scan than vertical lists).

65. *Id.* at 49, 112–13, 117.

66. *Id.* at 115; NIELSEN & TAHIR, *supra* note 57, at 19.

67. Outing & Ruel, *supra* note 44 (users look only at left third of news blurb, for less than one second).

68. See NIELSEN & TAHIR, *supra* note 57, at 19 (discussing need for clearly scented links).

69. Graphic elements may be loosely defined as non-content design features. On Westlaw and LexisNexis, search boxes are the most frequently encountered graphic elements.

70. See, e.g., Granka et al., *supra* note 40, at 43.

essarily draw the eye more quickly at the onset of viewing a screen.<sup>71</sup> People often click on photos, even if this takes them nowhere.<sup>72</sup>

¶20 Finally, it is helpful to consider how socio-economic differences affect web behavior. Good design for one person is not necessarily good design for all. There are differences between how the information rich and information poor for a given community approach online research, and differences also between cultures.<sup>73</sup> Law students are generally novices to the world of law and legal research. They are unfamiliar with the nomenclature. Information scents that are strong for lawyers may be weak for law students. The extremely hierarchical structure of the law and of legal research sources is foreign to students and may hinder their use and understanding of advanced materials available in Westlaw and LexisNexis. Thus, in addition to their relatively low information fluency, law students are also legal-information poor, which will affect, probably negatively, their early interactions with these complex information architectures.

### Methodology

¶21 Research experts advocate the use of secondary sources,<sup>74</sup> small jurisdictional databases, and browsing by tables of contents and indexes, where available, as cost- and time-effective strategies.<sup>75</sup> Thus, to assess the usability of the Westlaw and LexisNexis interfaces, I conducted a heuristic analysis of three separate task-based scenarios: 1) finding Alabama statutes, including access to the table of contents or index; 2) locating a database that searches both state and federal cases in

71. *Id.*; Outing & Ruel, *supra* note 44 (particularly on newspaper pages).

72. Outing & Ruel, *supra* note 44.

73. Walton & Vukovic, *supra* note 26, at 70–71. This article focuses on the U.S. environment, but trained attorneys in other countries may also encounter problems in navigating Westlaw and LexisNexis, which have their digital roots firmly planted in the United States, simply based on differences in cultural norms and mores. *See also* Bing Pan et al., *The Determinants of Web Page Viewing Behavior: An Eye-Tracking Study*, 2004 SYMPOSIUM ON EYE TRACKING RESEARCH & APPLICATIONS 147 (gender may affect how users interact with web sites).

74. *See, e.g.*, Patrick Meyer, 2007 Legal Research E-Survey, slide 10 (PowerPoint presentation prepared for the Back to the Future of Legal Research Conference at Chicago-Kent College of Law, May 18, 2007), available at <http://www.kentlaw.edu/academics/lrw/future/handouts/meyer%20powerpoint.pdf> (law firms ranked research in secondary sources second in importance behind only cases/digests); LexisNexis, Workplace Productivity Survey, slide 43 (Feb. 20, 2008), available at [http://www.lexisnexis.com/literature/pdfs/LexisNexis\\_Workplace\\_Productivity\\_Survey\\_2\\_20\\_08.pdf](http://www.lexisnexis.com/literature/pdfs/LexisNexis_Workplace_Productivity_Survey_2_20_08.pdf) (more than 75% of legal professionals surveyed reported that tools that provide analysis and expertise in addition to data are somewhat important or very important).

75. *See, e.g.*, AMY E. SLOAN, BASIC LEGAL RESEARCH: TOOLS AND STRATEGIES 333–43 (3d ed. 2006); J.D.S. ARMSTRONG & CHRISTOPHER A. KNOTT, WHERE THE LAW IS: AN INTRODUCTION TO ADVANCED LEGAL RESEARCH 226–35 (2d ed. 2004); Harvard Law School Library, Research Methodology, [http://www.law.harvard.edu/library/services/research/guides/united\\_states/basics/research\\_method.php](http://www.law.harvard.edu/library/services/research/guides/united_states/basics/research_method.php) (last visited Oct. 2, 2008); Georgetown Law Library, Secondary Sources Research Guide, <http://www.ll.georgetown.edu/guides/secondary.cfm> (last visited Oct. 2, 2008); Georgetown Law Library, Finding Statutes, <http://www.ll.georgetown.edu/guides/statutes.cfm> (last visited Oct. 2, 2008); Cornell Law Library, Basics of Legal Research, <http://library.lawschool.cornell.edu/WhatWeDo/ResearchGuides/Basics.cfm> (last visited Oct. 2, 2008).

Alabama; and 3) finding an Alabama civil procedure treatise, including the table of contents.

¶22 The databases selected are sources that should be of high value to lawyers and first-year law students in completing knowledge-crystallization tasks. Alabama was chosen simply because it is the first state alphabetically; every state has comparable primary and secondary materials. For a treatise, I chose a state civil procedure because it is a topic for which many attorneys are likely to need assistance from a secondary source on a fairly regular basis. Each provider carries only one Alabama treatise on topic: *Alabama Evidence* (Westlaw) and *Alabama Civil Procedure* (LexisNexis). The various features included were chosen to highlight the relative availability of browsable (as opposed to searchable) content from each of the two providers.

¶23 For each scenario, primary attention was given to page layout, navigation, links, and graphic elements. Because I was specifically considering the needs of law students and lawyers, great attention was given to likely information-foraging behavior and the relative strength or weakness of information scents. Access cost, i.e., the amount of work necessary to reach the designated target, was evaluated by the number of clicks and scrolls needed to locate the desired database or database feature.<sup>76</sup> My observations were made using a nineteen-inch flat screen desktop PC monitor, resolution set to 1024 by 768 pixels. Scrolling of any length was counted as a single click.<sup>77</sup> By ascertaining the access cost for each scenario, we can see how code architecture may be guiding information-foraging behavior.

### Analyzing Westlaw

¶24 Westlaw's user interface allows numerous navigational routes designed to suit various audiences and practice areas.<sup>78</sup> For each of the three target databases, I

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76. "The ratio of . . . screens visited to minimum number required to complete a task is a . . . measure of task difficulty in eye tracking studies." Goldberg et al., *supra* note 39, at 57; *see also* Pirolli, *supra* note 28, at 348 ("Search cost refers to the number of pages a user must visit before arriving at the desired page."). In Westlaw and LexisNexis, each click takes the user to a new screen. Similarly, scrolling brings a new area of screen into view. Thus clicks and scrolls combined should act as a suitable proxy for difficulty, i.e., cost.

77. Some people use scroll-wheels, while others may need to click multiple times on the scrollbar. In individual situations, the number of "clicks" will vary depending on a user's computer hardware and settings.

78. In the course of my research, Westlaw's user interface changed frequently. Notably, Westlaw has implemented a number of suggestions that I made when presenting this topic at the Back to the Future of Legal Research Conference at Chicago-Kent in May 2007. *See* Julie Jones, *Critically Assessing Subscription Web Design: Teaching Students How Website Design Affects Search Results and Research Costs* (PowerPoint presentation prepared for the Back to the Future of Legal Research Conference at Chicago-Kent College of Law, May 18, 2007), *available at* [www.kentlaw.edu/academics/lrw/future/handouts/Julie%20Jones%20Critical%20Web%20Design.pdf](http://www.kentlaw.edu/academics/lrw/future/handouts/Julie%20Jones%20Critical%20Web%20Design.pdf). However, it was too difficult to re-edit continually to keep abreast of their re-coding. To acknowledge this, I make note of recent alterations in footnotes, recognizing at the same time that the subject of my analysis is a moving target, and readers may encounter a different interface than that described here. Additionally, the changes can be seen as illustrating that the companies can and do change their code architecture. More minor changes have been made to LexisNexis; these too are noted in footnotes.

looked at three primary routes likely to be utilized by law students and lawyers: (1) the Law School Tab, (2) the Alabama Tab, and (3) the Directory.

### Law School Tab

¶25 For law students, Westlaw displays the Law School Tab as the default first page. A tab dedicated to law students tacitly implies that Westlaw deems the information provided on the page to be the best and most appropriate databases for law students. Why else would they be included here?

¶26 The Law School Tab presents the largest and most expensive databases first: all federal cases, all state cases, all state statutes, all forms, all news. This may encourage students to search in the largest, easiest to find, most expensive databases without conscious thought to jurisdiction or client needs. Because Westlaw (and LexisNexis) access is provided to law students on a flat-rate, unlimited use contract, there are no information costs aside from the students' time. This environment may create inefficient and expensive habits that are carried over into the "real world."<sup>79</sup>

¶27 Primary sources are placed in premier screen real estate where the eyes first visit.<sup>80</sup> This encourages students to search case law first, and perhaps statutes second, without considering secondary sources as an optimal starting point. Law schools implicitly collude in this belief and practice, which is antithetical to most actual legal research strategies, at least for novices to law or to a particular subject. Students are trained through the Socratic Method to discover the law by reading case after case, relying upon themselves to discern the majority rule and possible circuit splits, instead of relying upon authoritative commentary and analysis typical in treatises, looseleaves, and the like.

### Alabama Statutes

¶28 Looking for Alabama statutes, the information gatherer would likely click on "Statutes by State" and be linked to a page that provides a prominent search box at the top of the page, with a list of states below. There are check boxes next to each state, allowing the user to search multiple state statute databases at once. The states listed are nicely formatted for easy scanning. The search box, a rather large graphical image, is front and center in prime viewing real estate, with the word "search" printed around it in three locations. Given this encouragement and the fact that large images are fixated upon longer and more frequently, it is likely that users will be highly search-centered in their thinking on this page. For the user, the clear message is that they should use keyword searching in these statutory databases. There is no other option available.<sup>81</sup>

¶29 As will be described shortly, for each of the states listed, a table of contents, popular name table, and index are available if a different access route is taken.

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79. See *supra* note 3.

80. Westlaw recently added customizable features that allow users to add databases to this and other tabs.

81. Recently, Westlaw added links to the table of contents for all state statutes in this list. This is an improvement, though indexes are a more useful finding aid for statutes.

However, these browsing options are inaccessible via the Law School Tab. An information forager would likely deduce, given the fact that the information scent led them easily to this page, that this type of information is not available, and further, that this type of information-seeking behavior (i.e., browsing) is not a possibility or, perhaps, is undesirable, at least in regard to statutes. It took one click to access this page, which is very cost-efficient for the information forager. The information scent is strong and it appears to the user that no other options are available. However, the goal was not reached, as the index or table of contents was not located.<sup>82</sup>

### *Alabama Cases*

¶30 To find Alabama cases from the Law School Tab, the information forager would likely click on “Select Cases by State.” As with the interface previously described for statutes, a large search box is presented in a prominent location, followed by a list of states. There are no links to indicate that subject searching using West’s digest system is available, nor is there any link to allow subject browsing within the digest system.

¶31 In this case, the user has efficiently found a way to search Alabama cases. However, the user is not presented with the full range of databases available that might be of interest, including our goal database containing both state and federal cases for Alabama.<sup>83</sup> If searching state and federal Alabama cases is the goal, from the Law School Tab users are led only to a database where they can search state and federal cases for every jurisdiction combined. As will be described below, other more tailored, and less expensive, options are available elsewhere. Again, it took only one click to access this page and the information scent is strong. However, the user was not allowed to search just state and federal cases for the state of Alabama, so the goal was not reached.<sup>84</sup>

### *Alabama Treatises*

¶32 On the Law School Tab, secondary sources are listed on the right side of the page. This is slightly less visually grabbing real estate, but it is near the top of the screen and the list format makes scanning the page easy. One-click access is provided to the major secondary sources discussed in a first-year lawyering course, e.g., *Black’s Law Dictionary*, *American Jurisprudence*, *American Law Reports*, journals and law reviews, and Restatements. As with the presentation of statutes on the Law School Tab, links to tables of contents are not provided, although they may be available.

¶33 Because no state secondary materials are listed, foragers might select “Additional Materials” to explore their options. The next screen contains the standard prominent search box as well as a rather limited list of secondary sources. Federal materials dominate the list, with no state-specific materials listed. Few trea-

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82. With recent updates to Westlaw, the table of contents is accessed with two clicks. A savvy user might find the index with three clicks.

83. Westlaw recently added the option to search state and federal cases for each individual state.

84. With the new updates, the goal is reached in one click.

tises are listed, and those that are do not provide links to tables of contents. This effectively ends the information scent for the forager who receives the message that these are all the secondary sources available in Westlaw. A strong information scent was established, followed, and ended. The desired treatise was not found. The likely conclusion is that it does not exist within Westlaw.<sup>85</sup> This is a false conclusion.

### Alabama Tab

¶34 Navigating to the Alabama Tab, which would probably be a commonly utilized tab for an attorney practicing in that jurisdiction, takes no effort if it is designated the default tab, or one click if it is not, but if it is already set up as a tab in the user's account. The search box again resides in the choicest real estate for the screen, front and center, surrounded by the word "search," thus encouraging searching as the primary method for information seeking. Primary sources are still signified as the most important databases, with cases listed first and all other materials falling below the fold. Secondary sources are listed at the bottom of the page. This indicates to the user that these are less important databases; some users may not scroll to find them at all. Nevertheless, more options are available here than when using the Law School Tab.<sup>86</sup>

### Alabama Statutes

¶35 In scrolling down the list of databases presented on the Alabama Tab, a user should fairly quickly find the Alabama statutes. Here it becomes clear that Westlaw has the technology to make tables of contents and indexes available for databases arranged by subject. The placement of these links directly next to the name of the database is obvious, clear, and easy to see. The user has located the desired database, and can easily identify alternative methods that are available to find information by browsing instead of searching. The goal is reached with one click.

### Alabama Cases

¶36 Under the Alabama Tab, the information forager is presented with multiple, nuanced choices for accessing Alabama cases in various combinations of state and federal jurisdictional boundaries. The list begins with narrowest jurisdiction and moves progressively toward larger jurisdictions. The user is also given the option to search just headnotes (the digest database) for Alabama. This type of subject-based searching was not available within the Law School Tab. Here, the information scent is strong, and the goal is reached in an efficient manner without a single click.

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85. When this topic was presented at the Back to the Future of Legal Research Conference, *see supra* note 78, several audience members who teach legal research reported students who demonstrated this exact behavior and conclusion.

86. Individual jurisdictional tabs are now highly customizable, but perhaps not highly intuitive.

### *Alabama Treatises*

¶37 A few treatises and practice materials are listed at the very bottom this page, and for some of those, links to their tables of contents are provided. Westlaw contains considerably more secondary sources specific to Alabama than are indicated here, but without an additional link to those sources, the information scent dies, and the goal of finding an Alabama treatise on civil procedure fails.

### Directory

¶38 Navigating from the Directory, the primary gateway to all Westlaw databases, gives the user the full story. However, the access cost for finding databases through this gateway is significantly higher than for any of the tabs. Nevertheless, information foragers are proportionately rewarded with more content and information-seeking options.

¶39 To enter the Directory, the user must first click on “Directory.” This, in itself, is no small feat, since the Directory is the middle element in a list of links at the very top of the page, within the banner.<sup>87</sup> By comparison, the tabs below are located in more prominent screen real estate and are more noticeable. At the top, the user is presented with: “Find & Print / Keycite / Directory / Key Numbers / Court Docs / Site Map.” The first item, “Find & Print,” does not indicate primary navigational organization, and so implies that this group of links is not a primary source for information or navigation. Additionally, the strength of the information scent for the word “Directory” will likely vary considerably among users depending upon their individual associations with this word. Thus, simply finding Westlaw’s Directory can take time, energy, and training, an unhappy situation for the hungry information forager.

¶40 On the Directory page the user sees a small search box at the top of the screen that allows the option to find databases using a keyword search. This feature is prominently placed within the page, but the search box graphic does not dominate as it does on the pages previously discussed, minimizing its relative importance. Below the search feature, available databases are grouped based on type of source and jurisdiction. Little or no scrolling is needed to survey the entire page. Subsequent pages within the Directory can be difficult to navigate because Westlaw places folders for further drilling at the bottom of each list. This requires the information gatherer to know both that folders may exist out of sight beyond the fold, and that there will likely be better information within those folders.

### *Alabama Statutes*

¶41 Accessing the Alabama statutes database can take between four and six clicks, depending on the route.<sup>88</sup> Navigating to this database via the Directory is the

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87. I frequently advise my students to click on Directory. The inevitable response is “Where?”

88. Possible routes include:

- Directory > US state statutes > statutes folder/individual states > Alabama statutes (four clicks)
- Directory > US state materials > Statutes & Legislative Services > Statutes annotated > Alabama (five clicks)
- Directory > US state materials > other US states > Alabama > Statutes and Leg Materials > Alabama Statutes (six clicks)

most labor intensive for the information forager, even assuming all the correct links are selected. For those in the know, users can simply enter “alabama statute” in the directory search box, retrieving a list of databases, and click on the desired result. For this search, the database would probably be the first or second result listed. This is a much more direct and efficient route.

¶42 Once the user reaches the statutes, links to the full array of information-seeking options are presented: full-text searching, find by citation, table of contents, index, popular name table, and fifty-state surveys. Accessing this very same database through other routes yields either none or just two of these five options. To put it plainly, depending on the access route, a single Westlaw database may have up to three different interfaces containing three different versions of what is available.<sup>89</sup> The most difficult and labor-intensive route (the Directory) provides the most choices.

¶43 The choices are available, but are they visible? The links to these extra options are on the right-hand side of the page, one of the last-viewed areas by users. In real estate terms, they are in a bad neighborhood. Like the quest for “Directory,” this list begins and ends with the least relevant choices, hiding the best options in the middle of the list: “Find by Citation / Table of Contents / Statutes Index / Pop. Name Table / 50 State Surveys.” Furthermore, their location and text color minimize their importance compared to the prominent search box. To access these other options, the user must identify and interpret the links, then click yet again to gain entry. While this page represents the best berry bush for the database available, the access cost is extremely high. A strongly motivated bear willing to click four to six times is needed for success.

### *Alabama Cases*

¶44 Accessing Alabama cases presents similar issues when navigating from the Directory. On this particular trail, the user is presented with numerous choices with questionable scents. Making no false moves, it requires four to five clicks to obtain the desired database.<sup>90</sup> Once here, the information forager is only allowed to search this database. There are no links to search headnotes or other digest features. However, the intended goal is reached with a moderate access cost. From the Directory, searching for “Alabama state federal cases” retrieves the desired database with less effort.

### *Alabama Treatise*

¶45 As with Alabama cases, navigating from the Directory to find the Alabama civil procedure treatise can be confusing and require significant energy.<sup>91</sup> Both

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89. As has been noted, Westlaw is making additions to tabbed access that help novice users identify alternate methods of information seeking within certain databases.

90. Available routes potentially include:

- Directory > U.S. State Materials > Case Law > Combined State and Federal Cases by State > Alabama (five clicks)
- Directory > Cases > Combined State and Federal Cases by State > Alabama (four clicks)

91. Two routes which, based on information scent, skilled users would likely travel, are:

- Directory > Treatises, CLEs, Practice Guides > [scroll] > Texts & Treatises in TEXTS & TP-ALL > Databases beginning with A > [scroll] > Alabama Evidence (seven clicks)

routes require seven clicks. The second route rewards the user with a complete list of all secondary sources available for the relevant jurisdiction. From this list, the information forager may select Alabama Evidence. As when accessing Alabama statutes from the Directory, users are presented with a large, prominent search box surrounded by the word “search” in two areas on the page. Browsing options via the table of contents are again relegated to the far right-hand side of the screen in the least-viewed area of the page. The goal is accomplished with a significant access cost. Searching the Directory for “Alabama evidence” would quickly retrieve the desired database.

### Westlaw Summary

¶46 Comparing the access costs of the various navigation routes, figure 1 makes it clear that browsing using the tabs is more effective, when successful, than browsing via the Directory. Reaching the desired goal using either the Law School Tab or the Alabama Tab required between zero and two clicks. Reaching those same targets with the Directory required between four and seven clicks. However, locating the treatise failed at both tabs, with success coming only through the Directory and with the highest access cost. Figure 2 illustrates that searching for these same databases required little analysis of the result list, as the target source appeared within the first two results for each search.

¶47 The Westlaw interface presents a mixed bag. It offers a great many resources that allow information foragers to accomplish knowledge-crystallization tasks efficiently, such as tables of contents, indexes, and popular name tables. Many pages are nicely formatted, with lists presented in an easy-to-skim layout. This makes for simple information access, if you know where to look.

	Law School Tab	Alabama Tab	Directory
Alabama Statutes TOC/Index	Fail / 2 clicks	1 click	4–6 clicks
Alabama State & Federal Cases	Fail / 1 click	0 clicks	4–5 clicks
Alabama Treatise TOC	Fail	Fail	7 clicks

**Figure 1.** Access costs in Westlaw by browsing via tabs and Directory

Note: Under Law School Tab, past/present performance is indicated.

	Search Terms	Location in Result List
Alabama Statutes TOC/Index	Alabama statutes	1st
Alabama State & Federal Cases	state federal Alabama cases	2nd
Alabama Treatise TOC	Alabama evidence	2nd

**Figure 2.** Access costs in Westlaw by searching via Directory

- Directory > U.S. State Materials > Other U.S. States > Alabama > [scroll] > Forms, Treatises, CLEs, and Other Practice Materials > Alabama Evidence (seven clicks)

¶48 At the same time, the interface places numerous obstacles between the forager and some of these same resources. Within tabs, misleading information scents in the form of artificial dead ends are a great hindrance to information seekers attempting to find relevant databases that will fit their needs. Similarly, difficult access to and through the Directory means that users may never appreciate the full range of sources available on Westlaw. Through code architecture, information foragers are encouraged to browse to find databases and then keyword search within them, even when searching to find databases and browsing within them may be preferable methods of information-seeking behavior. Furthermore, through page design, access costs for primary sources are smaller than for secondary, and for students, large multijurisdictional database searching is encouraged over single-jurisdiction.

¶49 What is particularly disturbing with Westlaw is the high variability in the level of access to databases provided, depending upon the intended audience. For each access method discussed, a different interface with different options is presented for a single database. The Law School Tab presents students with the most limited choices, both in terms of the number of databases available, as well as the ways in which the content within these databases may be accessed. In the not so distant past, students had been presented with a single option—searching—which likely predisposed them to believe that searching was the only option available on Westlaw. Recently, Westlaw has begun adding links to tables of contents for select databases. This is a good beginning, but more can be done, particularly in our Web 2.0 environment.

### Analyzing LexisNexis

¶50 Unlike Westlaw, LexisNexis has no Law School Tab. The default entry tab for LexisNexis, regardless of whether you are a lawyer or law student, is the Legal Tab, which is the LexisNexis counterpart to Westlaw's Directory, providing a gateway to all LexisNexis databases. Because LexisNexis does not offer a Law Student Tab, I considered how information foragers can navigate to the three target databases using two routes: the Legal Tab and the Alabama Tab. In addition to the smaller number of tabs examined, LexisNexis does not provide the same range of alternate information-seeking options as Westlaw, and also does not create some of the same hindrances. Because of this, their code architecture requires less discussion.

#### Legal Tab

¶51 Having the Legal Tab as the default entry gateway to LexisNexis is helpful for researchers. Access to all databases is possible from here, and law students are tacitly encouraged to explore all available resources, not just those preselected through a dedicated tab. The search feature available on Westlaw to locate databases is also present on LexisNexis, though in a less obvious location. Users must navigate to the "Find a Source" Tab to search for LexisNexis databases. The relatively weak information scent of this label may be an issue for a considerable number of users. Furthermore, the tab is formatted to always be the last tab presented,

implying that as a database-finding tool, it has less value. This is unfortunate, as searching for databases can be considerably quicker and easier in some situations than browsing for them. Additionally, LexisNexis offers the added benefit of retrieving in its “Find a Source” search results all static pages on which a database appears anywhere in LexisNexis.<sup>92</sup> These cues may help the information forager locate other useful groups of databases, heretofore unknown berry patches, worthy of exploration.

¶52 On many pages, the LexisNexis method of formatting lists is an issue. It is often unclear whether a source is listed on one line or two lines. Within lists, lines are sometimes double-spaced, sometimes single-spaced, sometimes black, sometimes blue. Due to this formatting, skimming the page quickly is difficult, and it requires more work and energy to analyze and interpret the various information scents and cues. The vertical lists also take up more screen space, which in turn makes most pages extend below the fold.<sup>93</sup> As on Westlaw, LexisNexis places its largest, most expensive primary law databases first in the prime viewing area of the screen. The links to smaller, less expensive jurisdiction-specific or secondary source databases are below the fold and out of sight.

### *Alabama Statutes*

¶53 To access Alabama statutes from the Legal Tab, there is only one clear route.<sup>94</sup> Along the way, links are well tagged, resulting in a strong information scent and making it less likely that the information hunter will get lost along the way. Once at the desired database, the user is presented with a simple and clear layout. A small search box consisting of a single line is clearly visible, but does not dominate the page. This allows the eye to move past it more easily to consider other aspects of the page. Immediately below this is the table of contents for the entire publication. The user need click on nothing nor scroll, but is immediately presented with the browsing option. LexisNexis does not offer statute indexes or popular name tables, so those aren't listed.<sup>95</sup> What LexisNexis does offer is the table of contents, and here that is obviously displayed for transparent information-foraging access. Our legal bear has successfully navigated to the correct page, and all options available for both searching and browsing are presented. The goal is achieved in four clicks, a moderate access cost. Searching for “Alabama statutes” from the Find a Source Tab retrieves the desired database as well.

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92. LexisNexis has since changed this feature, simply returning a list of results containing the searched-for terms, many times in questionable order of relevance.

93. I once witnessed a LexisNexis representative attempt to locate a particular database via the Legal Tab. The desired source resided below the fold and it took the rep a few tries, navigating to multiple pages, and considerable searching to locate the source because, even to an expert searcher, it wasn't obvious that scrolling was needed.

94. [scroll] > States Legal U.S. > Alabama > Code of Alabama or Alabama Constitution, Court Rules & ALS, Combined (four clicks)

95. LexisNexis recently added fifty state surveys to its service, but these are not made available from this page as they are on Westlaw's comparable page.

### *Alabama Cases*

¶54 A variety of avenues are available for navigating to state and federal Alabama cases on LexisNexis, most with fairly clear information scents.<sup>96</sup> Once at the desired database, the user is presented with a large search box. Browsing or searching by LexisNexis's headnote system is not included as an option. The goal is achieved in three to four clicks. Interestingly, searching the Find a Source Tab for "state federal alabama cases" is unsuccessful. Multiple search queries were attempted, and all failed.<sup>97</sup>

### *Alabama Treatise*

¶55 Navigating to the desired secondary source is quite a bit trickier for the information forager. For some secondary sources, LexisNexis provides extremely weak information scents by labeling sources by the publisher's brand name rather than by the type of material provided. For example, treatises are not called treatises. Rather they are called "Matthew Bender," "Mealey," "Aspen," "John Wiley," and "BNA," to mention just a few. For new researchers, this leaves the information scent cold from the start. For experienced researchers, the scent may be strong or weak depending on their individual knowledge.

¶56 The access cost to reach this treatise is considerable.<sup>98</sup> Furthermore, the information scent goes cold at least once in any single route. In the first, it goes cold when the user must choose between numerous obscurely named resources. Only someone who knows that Matthew Bender is LexisNexis's treatise publisher will easily make that link. It is also unclear whether other proprietary names might also include relevant treatises. Foragers are left wondering if they have missed something, perhaps something important. Additionally, because of how the list is formatted and the need for scrolling, finding the link to state-based materials on a subject is likely to be challenging for many information seekers.<sup>99</sup>

¶57 Once at the database page, the user is presented with an interface nearly identical to that of the Alabama statutes—a relatively small search box is followed by the table of contents. Again, this allows the forager to make an informed decision as to which method of information seeking she will use within the selected

96. These include:

- Cases U.S. > All Courts by State > Alabama Federal & State Cases, Combined (three clicks)
- [scroll] > States Legal U.S. > Alabama > Alabama Federal & State Cases, Combined (four clicks)

97. This has changed with LexisNexis's new "Find A Source" functionality—the correct database appears first on the list when "state federal alabama cases" is entered.

98. Routes to the desired treatise include:

- [scroll] > Secondary Legal > Matthew Bender > By Jurisdiction > Alabama > Alabama Civil Procedure (six clicks)
- [scroll] > Matthew Bender > By Jurisdiction > Alabama > Alabama Civil Procedure (five clicks)
- Area of Law by Topic > Litigation Practice & Procedure > [scroll] > By State > Alabama > Alabama Civil Procedure (six clicks)

99. The author missed the link during her first and second looks at the page.

database. The goal is accomplished in five to six clicks if perfectly navigated. Searching for “Alabama civil procedure” identifies the target database more easily.

### **Alabama Tab**

¶158 Navigating to the Alabama Tab takes just one click, or no clicks if the user designates it as the default tab. Because this dedicated page lists more individual databases, the formatting allows for easier scanning. As with the Legal Tab, primary materials are given the choicest real estate in the top and mid-left of the screen. However, unlike on the Legal Tab, secondary sources are visible above the fold. Many other materials still require scrolling, though. Oddly, LexisNexis has recently renamed what was “Secondary Legal” to “Search Analysis & CLE Materials.” For many users, this terminology may be non-intuitive. Upon reflection, it is clear that LexisNexis did this because they have separated law journals and periodicals from the larger secondary sources grouping for this page. However, foragers may be left with a relatively weak information scent to follow. Most law students will have little idea what CLE stands for, or what types of resources are indicated by “Analysis.”

### *Alabama Statutes*

¶159 Depending on the user’s computer screen size, some scrolling may be needed to access Alabama statutes from the Alabama Tab. However, the links are easily located on the left and can be accessed with a single click. The user is presented with the exact same interface seen when accessing the database from the Legal Tab. The goal is achieved with a low access cost: one click.

### *Alabama Cases*

¶160 Alabama cases are presented in the prime real estate for this tab. The Alabama Federal and State Cases database is listed second after All State All Federal Cases Combined. If the user desires more choices, he may select “View more sources” to see further divisions of cases by court type or jurisdiction. Searching by area of law or subject is also allowed. After selecting Alabama State and Federal Cases, the user is presented with the exact same interface seen when navigating to this database from the Legal Tab. The goal is accomplished with one click.

### *Alabama Treatise*

¶161 Alabama Civil Procedure is the first database listed under the Analysis and CLE category. Clicking on the link, we are taken directly to the source. The format of the page is identical to the one seen when accessing the same database from the Legal Tab: goal accomplished with one click.

### **LexisNexis Summary**

¶162 Access costs for LexisNexis were generally less than for Westlaw. Again, subject or jurisdictional tabbed browsing performed better than navigating through the main gateway, as demonstrated in figure 3. All target databases were reached with a single click using the Alabama Tab. Accessing the same databases via the Legal Tab required between three and six clicks. As with Westlaw, accessing the treatise was the most expensive for the information forager. Searching for the desired sources was not always successful, as evidenced by figure 4. Alabama stat-

	Law School Tab (Not Applicable)	Alabama Tab	Legal Tab
Alabama Statutes TOC/Index		1 click	4 clicks
Alabama State & Federal Cases		1 click	3-4 clicks
Alabama Treatise TOC		1 click	5-6 clicks

**Figure 3.** Access costs in LexisNexis by browsing via tabs

	Search Terms	Location in Result List
Alabama Statutes TOC/Index	Alabama statutes	1st
Alabama State & Federal Cases	state federal Alabama cases	search failed / 1st
Alabama Treatise TOC	Alabama civil procedure	1st

**Figure 4.** Access costs in LexisNexis by searching via Find a Source

Past/present performance indicated if applicable.

utes and the Alabama treatise were located as the first item in the result list. However, the search failed to find the needed case law database.

¶63 Like Westlaw, the LexisNexis user interface has both positive and negative characteristics. LexisNexis's consistent presentation of databases to all audience types, as well as the obvious display of browsing options, where available, is excellent. It is clear that no matter which route is taken to access a database, the same search and browse options are available and clearly presented. However, like Westlaw, LexisNexis consistently exhibits larger primary source databases more prominently than small primary or secondary sources, subtly encouraging use of the former and discouraging the latter.

¶64 The primary drawbacks of LexisNexis are its weakly scented links and cumbersome lists. Use of secondary sources is particularly disadvantaged by LexisNexis's reliance on brand-name links. For users who prefer browsing to access their desired database, significant knowledge of LexisNexis proprietary products is required, as is scrolling, since most pages contain lengthy, poorly formatted lists of links. Combined, these factors may render navigating LexisNexis quite difficult, particularly for the law student.

## Conclusion

¶65 As information foragers, law students and attorneys alike benefit from the efficient accomplishment of knowledge-crystallization tasks. The authority of treatises and other secondary sources is of great value in this process. Additionally, browsing materials arranged by subject or accessing materials via an index can reap significant information-gathering rewards, making subsequent searches within primary sources, particularly case law, more effective. Westlaw and LexisNexis both provide a vast array of excellent primary and secondary law databases, sophisticated search capabilities within databases, and methods to browse into select databases. They are, in essence, indispensable for the modern legal information gatherer.

¶166 However, the use of secondary sources and browsing within databases is discouraged by these legal information providers. Through code architecture, information foragers are led to keyword search within easily accessible primary law databases. In Westlaw in particular, available browsing options within certain databases are sometimes made quite cumbersome to access. More effort is almost always required to locate smaller databases and secondary sources, and more effort still to access non-keyword foraging features. This makes it more onerous for law students to learn how to intelligently select databases, rather than relying on those conveniently provided. It also impedes their learning efficient online legal information-seeking strategies beyond the ubiquitous keyword search.

¶167 To assume that economic reasons underlie Westlaw and LexisNexis's code architecture is, in a word, easy. A company's profits may well be boosted by simply manipulating navigational choices, database selection, and access costs to guide users into keyword searching of the most expensive databases. Leading the user to content obtained for free (cases and statutes) may benefit the bottom line more than leading the user to licensed content requiring royalty payments to the copyright owner (treatises and other secondary sources). This strategy of encouraging keyword searching in large multijurisdictional or combined primary law databases would presumably result, particularly for the novice researcher, in multiple ill-formed searches, adding to the company's bottom line. One might expect more seasoned researchers to take advantage of alternative foraging and berry patch selection behaviors provided in Westlaw and LexisNexis. But the apprentice user, the law student or new associate, is an easy target for these choice architecture influences.

¶168 Is it all about the money? Perhaps Westlaw and LexisNexis have conducted focus groups that communicated users' love of their interfaces. Westlaw may have asked students to which resources they want easy access on the Law School Tab.<sup>100</sup> Or maybe these megaliths of code are unaware that they have created such influential choice architectures.<sup>101</sup> Certainly, there is limited screen space, and web design for such massive information aggregators is no facile undertaking. However, these theories ring somewhat hollow. The amount of revenue that can be generated by manipulating database selection and information gathering is surely a considered factor.

¶169 As these companies face increased competition from free online primary law sources,<sup>102</sup> tools designed to aid legal researchers,<sup>103</sup> alternate subscription-

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100. Though the wisdom of making design choices for such sophisticated systems based on the desires of the newest users with the least amount of training might be questionable.

101. Westlaw's most recent interface updates indicate that they are listening to client concerns. They have implemented customizable tabs, allowing users to rename and add groupings and databases to their specifications. While the use of indexes and tables of contents is available from these tabs, these features are still not visually optimized, resulting in higher access costs than those for searching.

102. See, e.g., AltLaw, [www.altlaw.org](http://www.altlaw.org) (last visited Oct. 13, 2008); Public Library of Law (PLoL), [www.plol.org](http://www.plol.org) (last visited Oct. 13, 2008); Justia, [www.justia.com](http://www.justia.com) (last visited Oct. 13, 2008); PreCYdent, [www.precydent.com](http://www.precydent.com) (last visited Oct. 13, 2008); Legal Information Institute (LII), [www.law.cornell.edu](http://www.law.cornell.edu) (last visited Oct. 13, 2008).

103. See, e.g., Cornell Law Library, Legal Research Engine, <http://library.lawschool.cornell>

based sources,<sup>104</sup> and other resources yet to be invented, they will hopefully become more responsive to concerns such as those presented in this article. There are many improvements that could be implemented that would increase functionality and ease of use, decreasing the access costs for valuable databases and features. In the meantime, those who teach research can help incoming legal foragers examine these information providers with a critical eye, thereby increasing their information fluency and research efficiency.

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.edu/WhatWeDo/ResearchGuides/Legal-Research-Engine.cfm (last visited Oct 13, 2008); LLRX, [www.llrx.com](http://www.llrx.com) (last visited Oct. 13, 2008).

104. *See, e.g.*, Bloomberg Law, <http://about.bloomberg.com/professional/blaw.html> (last visited Oct. 13, 2008); FastCase, [www.fastcase.com](http://www.fastcase.com) (last visited Oct. 13, 2008); LoisLaw, [www.loislaw.com](http://www.loislaw.com) (last visited Oct. 13, 2008); VersusLaw, [www.versuslaw.com](http://www.versuslaw.com) (last visited Oct. 13, 2008).