

WRITING (AND READING) APPELLATE BRIEFS IN THE DIGITAL AGE

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Readers—appellate judges and appellate lawyers among them—are transitioning from reading paper documents to reading a mix of paper and digital documents.¹ Simultaneously, researchers are studying the impact that this transition has had on the process of reading.² Although these studies rarely focus on judges or lawyers,³ many scientists are studying how our

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1. E.g. Anne Mangen, Bente R. Walgermo & Kolbjørn Brønnick, *Reading Linear Texts on Paper versus Computer Screen: Effects on Reading Comprehension*, 58 Intl. J. of Educ. Research 61, 61 (2013) (“There is an ongoing transition of reading from print to screen[,] and the book is challenged by an increasing number of digital reading devices”); Raymond P. Ward, *How U.S.5th Circuit Judges Read Briefs*, Louisiana Civil Appeals, <http://raymondward.typepad.com/la-appellate/2013/10/how-us-5th-circuit-judges-read-briefs.html> (Oct. 8, 2013) (noting that “most of the [Fifth Circuit] judges read brief[s] on iPads”) (accessed Sept. 10, 2014; copy on file with Journal of Appellate Practice & Process).

2. E.g. Rakefet Ackerman & Morris Goldsmith, *Metacognitive Regulation of Text Learning: On Screen Versus on Paper*, 17:1 J. Experimental Psychol.: Applied 18 (Mar. 2011).

3. Undergraduate and graduate students are the subjects of many empirical research studies, e.g. Geoffrey B. Duggan & Stephen J. Payne, *Text Skimming: The Process and Effectiveness of Foraging Through Text Under Time Pressure*, 15 J. Experimental Psychol.: Applied 228, 230 (2009) (noting research about a group of thirty-two students from England’s University of Manchester, mean age 21.75 years); *but see* Craig Tashman & W. Keith Edwards, *Active Reading and Its Discontents: The Situations, Problems and Ideas of Readers*, CHI 2011, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems 2927, 2929 (2011) (noting the problem of overuse of student populations in studies, and choosing a more diverse group of “knowledge workers” that included two IP Lawyers).

brains work when we read, and they are asking a lot of questions: How do we perceive digital text? How do we interact with it? Do we understand digital text better or worse than hard-copy text? If the answer is worse, what features or behaviors impede or promote comprehension and use of digital documents? How should our reading and writing change to accommodate the impact of the new technology?

In the future, more and more of us will be using more and more digital sources for our reading and writing, regardless of whether or not digital reading is more effective. This essay will consider ways to make that reading easier, but it will usually not make recommendations as to particular software or hardware; instead, it will advise appellate lawyers and appellate judges—all of whom are professional readers and writers—about features they should look for when making decisions about digital reading.

This essay will briefly review a slice of the voluminous research about how human beings read digital as opposed to paper text. In particular, it will discuss studies of knowledge workers (defined to include those who use or generate knowledge in their work)⁴ and those who engage in active reading (defined as a reading process that includes non-sequential reading, searching a text, comparing texts, annotating, bookmarking, and the like).⁵ It will then make suggestions for legal readers, legal writers, courts, and database providers as to how best to accommodate the process of digital reading.

1. HOW IS DIGITAL READING DIFFERENT FROM READING PAPER?

In some ways, digital reading is just like paper reading: We are reading the same alphabet, and our eyes are moving from left to right as we read the words. This essay, however, will address two of the ways in which digital reading is different from paper reading. First, digital reading is different because of how we interact with digital text; our brains work differently when encountering digital text than when encountering paper text.⁶

4. See generally E. Kevin Kelloway & Julian Barling, *Knowledge Work as Organizational Behavior*, 2 Intl. J. Mgmt. Rev. 287 (2000).

5. Tashman & Edwards, *supra* note 3, at 2927–28.

6. E.g. Mangen, et al., *supra* n. 1, at 66.

Second, digital reading is different because by definition, we read digital documents in a digital setting. That digital setting almost always comes with close-at-hand distractions that may interfere with efficient and effective reading and comprehension.

1.1 Digital Reading Realities

To understand the impact of digital reading, it helps to understand some of the realities of paper reading. We read paper texts with more than just our eyes: We encounter paper texts physically as well as mentally. First, we are aware of the heft of the text: We hold a twenty-page handout very differently from a heavy hardbound book like *Harry Potter and the Goblet of Fire*. Our physical awareness has mental benefits. We maintain an awareness of the entire document, even as we focus on just one word or one page. When we turn a page, we feel the action, and we may also hear it. If we drop the book or document, or lose our place, we may see, feel, and hear the pages flip past us.

With a paper document, we sense our approximate location in the document: We know, without conscious effort, whether we are near the beginning, the middle, or the end. Scientists note that “the reader can see as well as tactilely feel the spatial extension and physical dimensions of the text, as the material substrate of the paper provides physical, tactile, spatiotemporally fixed cues to the length of the text.”⁷ Our neuro-spatial awareness of the pages we read can help us to remember and locate text: Researchers have learned that paper readers often maintain a mental image of the physical location of words or information—remembering that an important sentence appeared, for example, in the upper-left quadrant of a page in the open book. This physical awareness also acts as a structural cue, giving us a structural comprehension that makes it easier for us to grasp the organization of a paper document.⁸

Digital text provides far fewer physical cues to the reader. On a tablet, for example, every document “feels” like every

7. *Id.*

8. *E.g. id.* (observing that for digital readers, “their overview of the organization, structure and flow of the text might have been hampered due to limited access to the text in its entirety,” and surmising that this problem might be worse with longer texts) (citations omitted).

other document, whether we are reading a five-page report or *War and Peace*. Some devices may include a swishing sound, or try to use other methods⁹ to tell us when we are turning pages, but if there is no sound, we may unwittingly riff through a dozen or more pages by leaving a thumb in the wrong place while we reach for a cup of coffee.

If we are reading on a screen that requires scrolling, we may have no sense of “pages” at all. The scrolling text moves frequently, giving us no locational anchor for the words that we read. If the document is not well-suited to our device, we may find ourselves skipping ahead of the text and missing information accidentally. The lack of a physical document gives us no structural cues; if the document lacks meaningful headings or other organizational signals, we may have a hard time organizing the information mentally. Even if the document includes headings, the lack of physicality makes it harder to relate those headings to each other. These problems are exacerbated if we are reading on a small screen such as a tablet or a telephone.¹⁰

Despite this list of negatives, there are many positives to digital reading. Modern software allows easy annotation of documents, including text highlighting. Further, “knowledge workers” must often quote text from documents; digital text is easy to block and copy accurately from one document to another. Digital texts are also highly portable: A writer can carry the world on a tablet or laptop; a judge can read briefs or cases anytime or anywhere, without lugging boxes of paper around. Finally, digital texts are searchable: Writers can rely on the computer’s tireless brain to discover each use of a particular word or phrase, without worrying about missing a use due to fatigue or inattention.

Researchers are busily conducting studies to see what kinds of software can help to make up for the downsides of digital

9. E.g. Siriginidi Subba Rao, *Electronic Book Technologies: An Overview of the Present Situation*, 53 *Library Rev.* 363 (2004) (discussing generally the difficulties of providing substitutes for the haptic feedback that paper books provide).

10. And studies indicate that we are likely to be doing important reading in a variety of physical contexts, making it more likely that we will be using smaller reading devices. See e.g. Tashman & Edwards, *supra* n. 3, at 2930–31 (noting that authors of a study were surprised to find active readers “doing work-related [active reading] in bed, at picnic tables, at the kitchen table, and in a car”).

reading. For example, some software displays a table of contents on an embedded screen to the left of a reading pane; other software moves the words along at a set rate of speed.¹¹ Some software highlights headings and other aspects of the text that are likely to contain crucial information.¹² Similarly, researchers are studying the desks and other workspaces that knowledge workers use, seeking guidance to design that ever-elusive “workplace of the future.”¹³

1.2 Indirect Impacts of Digital Reading

Our comprehension of digital documents is affected not only by the way our brains perceive the digital text of the document we are reading; we are also affected by the package that the digital document comes in, and by the way we behave when we interact with digital documents.

Some of the problems with digital reading are related to some of their benefits. Digital readers appreciate the ability to access many different documents at the same time, to move back and forth between reading one document and another, and to move between reading documents and searching the web. This unlimited access, however, imposes a mental cost. Scientists talk about the limits on our mental bandwidth by using the term cognitive load to describe “the mental burden that performing a

11. E.g. Alexandra B. Proaps & James P. Bliss, *The Effects of Text Presentation Format on Reading Comprehension and Video Game Performance*, 36 *Computers in Human Behavior* 41 (2014) (discussing studies involving rapid series video presentation). The authors note that “[c]omprehension of single words and full paragraphs is possible with RSVP, but reading comprehension and retention is often reduced when the rate of presentation increases.” *Id.* at 42 (citations omitted).

12. See e.g. Kasper Hornbæk & Erik Frøkjær, *Reading Patterns and Usability in Visualization of Electronic Documents*, 10 *ACM Transactions on Computer-Human Interaction*, 119, 125–26 (2003) (describing an “Overview + Detail” pane to the left of the working screen).

13. *Id.*; see also Matthew K. Hong, et al., *Microanalysis of Active Reading Behavior to Inform Design of Interactive Desktop Workspaces*, Proceedings of the 2012 ACM International Conference on Interactive Tabletops and Surfaces (2012); Ken Hinckley et al., *Informal Information Gathering Techniques for Active Reading*, Proceedings of the SIGCHI Conf. on Human Factors in Computing Sys. (2012). An electronic version of this article is available at <http://research.microsoft.com/en-us/um/people/kenh/All-Published-Papers/Informal-Active-Reader-CHI-2012.pdf> (accessed Sept. 10, 2014; copy on file with Journal of Appellate Practice & Process).

task imposes on the learner.”¹⁴ Our brains can handle only so many mental tasks at any one time, whether those tasks are deciphering the written word, remembering previously learned information, or deciding between continuing to read a document and clicking a link to read related information.¹⁵

We might believe that if some information—such as the information in a written brief—is good, then more information must be even better. But research has shown that many readers comprehend information more thoroughly if they finish one text and then read another, as compared to readers who must choose how to navigate a path through link after link after link, deciding what information to read and how much of it to read.¹⁶ One study indicated that readers fared better when they faced a limited number of links (from three to seven, as opposed to between eight and twelve).¹⁷ Of course, a judge who links to a court opinion faces an unlimited number of links, as each opinion contains links to documents that contain other links.

Digital readers disrupt their mental processes when they click on link after link, or even when they click on a link, read for a while, and then navigate back to their original text. Scholars have noted that readers of complex documents must maintain a “situation model” that mentally organizes the information they are reading and integrates it with their existing knowledge.¹⁸ Clicking on links can be problematic:

Reading linked information in hypertext . . . requires the reader to assume responsibility for developing a coherent representation of the textbase. It is up to the reader to

14. Pavlo D. Antonenko & Dale S. Niederhauser, *The Influence of Leads on Cognitive Load and Learning in a Hypertext Environment*, 26:2 *Computers in Human Behavior* 140, 141 (2010).

15. *Id.* (analyzing previous studies and concluding that “[t]he additional cognitive and metacognitive processes involved in navigating and making meaning from linked hypertext nodes appears to increase cognitive demands on the reader”) (citations omitted).

16. *Id.* (reporting that “results indicated that learners who used links to compare and contrast concepts tended to have lower scores on learning measures than did those who employed a more sequential approach characteristic of reading traditional print text”) (citations omitted).

17. *Id.* (“[L]earning performance on a multiple-choice test and written summary, as well as subjective ratings of the hypertext system, were better when linking options were limited to 3–7 links, when compared to a comparable system containing 8–12 links”) (citation omitted).

18. *E.g. id.* at 141–42.

develop a coherent understanding of the content by integrating information from the text with prior knowledge, and creating a more sophisticated situation model. To accomplish this integration, the reader must hold conceptual representations encountered in a given node in working memory while considering how the information from a new node might relate.¹⁹

In addition to decisions about whether to click relevant links, digital readers must face other decisions as well: Emails and other work-related disturbances may interrupt their reading. Each time they hear a ding or feel a phone vibrating, for example, they know that they have a new email, and they must decide whether to access that email immediately or later. And of course, digital readers—and writers—face more than work-related distractions. As we all know, readers and writers “can easily be derailed . . . by the compelling and ubiquitous siren songs of . . . the Internet”;²⁰ when digital readers encounter dense or hard-to-understand text, those siren songs can be particularly tempting.

As modern digital readers, we may tell ourselves that we are multi-tasking when we work in front of a television, or when we hop back and forth between reading and browsing, between answering emails and conducting legal research. But scholars report that unless one of the tasks is mindless, multi-tasking is really serial mono-tasking, and it is almost always less efficient than focused attention on one task.²¹ Admittedly, a very few people have brains that are wired for effective multi-tasking; a study that measured function during two high-attention tasks, for example, identified some rare individuals whose use of a cell phone did not impair their driving.²²

19. *Id.* at 142.

20. David A. Rasch & Meehan Rasch, *Overcoming Writer's Block and Procrastination for Attorneys, Law Students and Law Professors*, 43 N.M. L. Rev. 193, 199 (2013).

21. David L. Strayer & Jason M. Watson, *Supertaskers and the Multitasking Brain*, *Sci. Am. Mind* 22, 22 (Mar./Apr. 2012) (referring to a comment attributed to Albert Einstein: “Any man who can drive safely while kissing a pretty girl is simply not giving the kiss the attention it deserves.”).

22. Jason M. Watson & David L. Strayer, *Supertaskers: Profiles in Extraordinary Multitasking Ability*, 17 *Psychonomic Bull. & Rev.* 479, 483 (2010). Readers of this essay should not assume that they are in this group. *Id.* (noting that people who are “wondering whether they too are supertaskers” should be aware that “the odds of this are against them”).

Further, if we are not paying focused attention as we read, we are hurting our ability to learn the information that we are reading about. This inability to “learn” may seem inconsequential; after all, much of the learning that attorneys and judges do is ephemeral and task-specific. Attorneys may believe that they need to learn only enough to answer the client’s question or make the client’s argument; judges may believe that they need to retain the relevant information only long enough to render a just decision. After all, we are unlikely to need that exact information again.

Yet while the information important to a specific appeal may seem relevant only to a short-term assignment, we all know of attorneys and judges whose years of experience in a particular area of law give them vast stores of knowledge that they may call on to solve new or related problems. Like experienced taxi drivers who know several ways to get from downtown to the airport, their insiders’ knowledge enables them to synthesize new and old information in sophisticated ways that are difficult to replicate in a computer program. But attorneys and judges who don’t master what they read are like drivers who use in-car navigation systems to find their way around an unfamiliar city: They may discover that they have not really learned where they were going. With no mental map to guide them through the unfamiliar streets, they are unable to switch smoothly to an alternate route if they encounter a “Road Closed” sign on the way out of town.

A loss of local knowledge may not be a problem for a driver, as the location of the exit for the airport is an objective truth that is always findable (so long as that in-car technology keeps working). But the jobs of the appellate judge and the appellate lawyer consist of far more than following routes established by computers. If we do not focus our attention enough to learn as we read, we may prevent ourselves, the courts, and our future clients from reaping the benefits of the stored knowledge that we would otherwise amass.

Similarly, when considering retrieval of information or knowledge, scientists distinguish between “remembering” and

“knowing.”²³ Knowledge that is remembered in this technical sense is best recalled in the specific context in which it was learned or, as the scientists say, encoded; knowledge that is known, in contrast, is retrieved more easily and can be called to mind independently of its original encoding.²⁴ Further, scientists believe that in most circumstances, “dividing attention during initial memory encoding impairs long-term retention.”²⁵

Even when digital readers are focused on the text that they are reading, they read differently than when they read paper text. In my own guidance for law students, I have distinguished between readers and what I call users: Under these definitions, a *reader* is reading text sequentially, while a *user* is skimming or scanning the text, looking for a particular bit of information or trying to decide whether a particular paragraph is worth reading.²⁶ To put it another way, readers are more likely to see what the document can teach them; they are more likely to read with an open mind. Users, in contrast, are more likely to have an agenda. They have already decided in some way what they want to get from the document, and they scan through the document searching for it.

All readers are likely to engage in a behavior known as satisficing.²⁷ When we satisfice, we cut our losses if we believe we are wasting time on a particular information-gathering task. For example, if you are in a hurry as you review a menu at lunchtime, you might place your order as soon as you see something good enough, or satisfactory, rather than spend more

23. E.g. Mangen et al., *supra* n. 1, at 62 (discussing the “Remember-Know paradigm”) (citations omitted).

24. *See id.* (“[K]nowledge which is Known is recalled, retrieved and applied without any . . . additional contextual associations.”).

25. Nicholas Gaspelin, Eric Ruthruff & Harold Pashler, *Divided Attention: An Undesirable Difficulty in Memory Retention*, 41 *Memory & Cognition* 978, 979 (2013) (recognizing that “it is well-established that dividing attention during initial memory encoding impairs long-term retention”) (citations omitted).

26. Mary Beth Beazley, *A Practical Guide to Appellate Advocacy* 2, 227 (4th ed., Wolters Kluwer 2014); *see also* Duggan & Payne, *supra* n. 3, at 236 (“In the Skim condition, participants spent more time reading the first half of each paragraph than the second half.”).

27. To satisfice is to adopt a behavior, accept a result, or choose a product that is “satisfactory or ‘good enough’” in a particular situation “without first examining all possible alternatives.” Herbert A. Simon, *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization* 119 (4th ed., Free Press 1997).

time reviewing the whole menu. If you are in a hurry as you are reading a brief, you might be more likely to stop reading when you believe that you have found what you wanted from it.

Users in satisficing mode—whether they are paper readers or digital readers—are likely to read the first one or two sentences of a paragraph and then skip the rest if those first sentences do not reveal the paragraph’s relevance to their reading agenda.²⁸ Likewise, a study targeting readers aged from thirty to forty-five indicated that

screen-based reading behavior is characterized by more time on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and more reading selectively; while less time is spent on in-depth reading and concentrated²⁹ reading, and sustained attention is decreasing.

Some common features of digital reading may make satisficing even worse for digital readers: If digital readers have searched a keyword, for example, they may satisfice by skipping to the next use of that term, a use that may not appear until several pages later. If their software does not include structural signals, digital readers may land in a new landscape with no cues as to their new location, and no cues as to how the information on that page relates to the information on the earlier page.

Further, digital readers may be over-confident about their learning, which may lead them to fail to spend the time needed to learn what they need to know.³⁰ This over-confidence was evident when researchers studied how college students learned from digital and paper documents. When study time was

28. See e.g. Geoffrey B. Duggan & Stephen J. Payne, *Skim Reading by Satisficing: Evidence from Eye-Tracking*, in *CHI '11 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Assn. for Computing Machinery 2011); see also Beazley, *supra* n. 26, at 233–37. Our impatience may well be affected by the size of our screens; eye-tracking studies show that many web searchers will choose to read one of the documents on the first page of results, or will choose the first document that looks useful, not even looking at the descriptions of later documents. In an Australian study of web-search behavior, researchers found a “definite” difference in users’ scanning behavior on differently sized screens. Jaewon Kim, Paul Thomas, Ramesh Sankaranarayana & Tom Gedeon, *Comparing Scanning Behaviour in Web Search on Small and Large Screens*, Proceedings of the 17th Australasian Doc. Computing Symposium 25, 30 (2012).

29. Ziming Liu, *Reading Behavior in the Digital Environment: Changes in Reading Behavior over the Past Ten Years* 61 *J. Documentation* 700, 705 (2005).

30. Ackerman & Goldsmith, *supra* n. 2, at 29.

controlled, both groups learned at about the same rate, but the digital learners over-predicted their learning.³¹ Further, when the students were able to control their study time, the digital learners did not spend enough time studying, and were unable to master the material at the level they desired.³² The researchers' conclusion: "although people are reluctant to study on screen, they can potentially do so as efficiently as on paper."³³

This potential for efficient on-screen learning is crucial. Interestingly, an earlier study had concluded that digital readers were likely to spend more time working when the software contained an overview pane that provided more structural cues.³⁴ The authors of that study reviewed the "satisfaction data" of the subjects, noting that it suggested that the overview + detail interface provided a variety of reader-friendly benefits:

[T]he overview + detail interface supported navigation, was easier to overview, invited exploration, seemed clear and convenient to use, and supported jumping directly to previously read text. The data suggest that subjects are free to concentrate on reading instead of [on] operating the interface. The higher subjective satisfaction might also, through higher motivation, affect the grades given to essays. Thus, although the overview + detail interface might be slower for question-answering tasks, we think designers would be well advised to use overview + detail interfaces for electronic documents.³⁵

Interest in reading more slowly benefits readers and those who rely on their work. A recent study indicates that "the natural learning process tends to be shallower on screen than on

31. *Id.* at 23 ("[A]lthough objectively there was no observed difference in encoding efficiency between the two media, the [screen learners] nevertheless felt subjectively that they had learned the material better than did [the paper learners]"). The documents used in this study were displayed in Microsoft® Word format.

32. *Id.* at 28.

33. *Id.* at 27.

34. Hornbæk & Frøkjær, *supra* n. 12, at 125–26 (describing a system that provides a "detail + overview pane" to the left of the reading pane.). Students who used Hornbæk and Frøkjær's system took longer to complete their tasks, but they wrote better essays than the students who used other interfaces. *Id.* at 140, 144. The authors hypothesize that the information pane helped subjects to remember the position of information within the overview pane, thus providing neuro-spatial cues. *Id.* at 140.

35. Hornbæk & Frøkjær, *supra* n. 12, at 144.

paper,”³⁶ while another study of web readers noted that “skimming is an effective method for quickly grasping the most important points of a text but . . . text that exclusively supports rapid reading may marginalise the more sophisticated processes present in slower reading.”³⁷ The authors of a study of time-pressured foraging behaviors note that “[w]here a deeper understanding of the text is required, it will sometimes be necessary to read not only the most important elements but also the micropropositions that set the context and provide coherence,” and praised “[t]he value of slower, more extensive reading.”³⁸

Likewise, we generally believe that deeper and broader understanding of the law and the facts will promote justice, and so it is disturbing to think that lawyers and judges may be reading shallowly, or may be skipping important information when they read and work. Fortunately, we know that digital readers can improve their reading, with appropriate time, education, and software. Most of the current studies have not focused on—or even included—lawyers and judges, and until more studies are done about how these readers use digital documents, it is difficult to tell what impact these realities may have on court rulings or on the practice of law. In the meantime, however, we can take our current knowledge of the digital world and try to adjust our behavior in a way that promotes deeper understanding of the written word.

2. COMPENSATING FOR THE IMPACT OF THE DIGITAL WORLD

The shift from paper reading to digital reading has obvious consequences. When the dimensionality of paper is stripped away, readers lose the neuro-spatial connections that promote structural comprehension and make it easier to understand the organization of the documents that they are reading. The lack of dimensionality means either that readers proceed without structural comprehension of large-scale organization or that they

36. Tirza Lauterman & Rakefet Ackerman, *Overcoming Screen Inferiority in Learning and Calibration*, 35 *Computers in Human Behavior* 455, 461 (2014) (reporting study results and suggesting methods for improving on-screen learning).

37. Duggan & Payne, *supra* n. 28, at 1149.

38. Duggan & Payne, *supra* n. 3, at 242.

must use other methods for determining structure, such as checking pagination, taking notes, or reviewing headings before or during the reading process. Even if these steps work well, they inevitably require increased cognitive energy, and thus they increase readers' cognitive load.

Further, as noted above, digital documents are often located in distraction-laden devices that invite the reader to stop the reading process and attend to other concerns. These invitations to multi-tasking also increase cognitive load and impose costs in time and comprehension. These costs exist even if the reader rejects all of the invitations, but especially if the reader doesn't.

Although it is tempting to suggest a return to paper, that resolution is unrealistic. Like it or not, we are moving to an all-digital, or mostly digital, world. What we need to do is to identify how to take advantage of digital benefits and compensate for the costs that digital documents impose.

The analysis in this section discusses how various consumers and producers of digital briefs and other documents can promote comprehension of digital documents. These consumers and producers are (1) readers of digital briefs, such as judges reviewing all of the briefs electronically filed in a particular appeal and lawyers reviewing their opponents' digital briefs; (2) lawyers who write digital briefs; (3) judges preparing digital opinions for electronic release; and (4) database providers.

2.1 What Readers Should Be Doing Differently

Before writers are digital writers, they are likely to be digital readers, as they conduct the research needed to create the digital documents that they send to courts. Likewise, judges and clerks are likely to be digital readers when they "consume" those documents.

Digital readers should take care when choosing a reading device. To counteract the lack of spatial signals, they should try to read on a device that provides fixed pages rather than one that requires scrolling. If the software can display a table of contents or other structural cues on the left side of the screen, so much the better. Generally, digital readers should avoid reading complex information on small screens, particularly on a phone-

sized screen. Bigger screens provide more structural cues; the best screen might display two legible pages of text at a time.³⁹ In the alternative, when reading on a desktop, turning the screen so that it is vertical rather than horizontal might allow more congruent, reading of PDFs and other fixed-page documents.⁴⁰

Digital readers should also choose software that allows easy annotation. Just as courts have often requested working copies so that they could mark up a non-official copy of the text, digital readers might create a working copy of research documents by transferring them from one type of software to another, if doing so will allow greater ease in annotation. Further, if reading on a large screen, they should consider whether enlarging the type will promote comprehension.

To provide a sense of the document as a whole and promote structural comprehension, digital readers should review the document in some way before beginning reading. First, they should note the number of pages in the document. If reading a book, they should read the chapter titles, or the first paragraph in each chapter. If they are reading an article or a brief, they can review the table of contents. If the document does not have a table of contents, they can scan through the document and read the headings, the topic sentences, the roadmap paragraphs, and the conclusions,⁴¹ jotting down thoughts on the overall purpose or content of the document.

Additionally, before beginning to read, digital readers should consciously decide whether they should be reading as a reader or a user. Are they certain about what they need from the document, or do they need to let the document teach them? Readers have always skipped certain portions of the document, but recent research indicates that digital readers are more likely to do so, and that they may be more likely to skip needed information.⁴² Readers who find themselves skimming and scanning through the document should ask if they know what

39. Increased screen size provides obvious benefits, but these benefits must be weighed against the costs in portability. *See e.g.* Tashman & Edwards, *supra* n. 3, at 2931, 2935.

40. I thank Matthew McKenzie, Adjunct Professor at the Moritz School of Law, for this suggestion.

41. *See* Beazley, *supra* n. 26, at 227–47 (discussing how these features of a document provide a template for the reader).

42. Duggan & Payne, *supra* n. 3, at 242 (noting the “increasing temptation to skip text” on the web).

they are looking for. If not, it may be time to stop skimming and start reading.

Further, digital readers should be active readers. They should engage with the text, highlight important passages, and insert annotations or electronic “sticky notes” when a thought occurs to them. To stay engaged with the text, they should use links strategically. Rather than abandoning the document each time they encounter a tempting link, they can annotate those that may be particularly relevant, perhaps identifying what they hope to learn from that link, and dropping a note on the spot so they are able to find it later. Often, the information in the link may appear later in the document; they may also find that several links lead to the same or similar information. By waiting to click, they can click more strategically.

Likewise, if digital readers find that they are multi-tasking or that they are distracted in other ways, they should seek out methods that will cultivate sustained attention.⁴³ Not surprisingly, a study of readers’ levels of sustained attention with different types of software (dynamic and static) and different mobile reading contexts (standing, sitting, and walking) showed that sitting promoted sustained attention; in some contexts, however, there were also benefits to walking while reading.⁴⁴

Finally, digital readers should consider printing a document if they realize that they are having a particularly difficult time understanding it. By reading a paper document, they reduce the cognitive load of these digital coping mechanisms and free up their mental bandwidth for the document’s substance.

2.2 What Writers Should Be Doing Differently

Digital writers, should use their knowledge of digital readers to write and design documents that will be easy to read and to use. If they are writing a document for a court, of course, they must generally follow court rules. But many courts have only minimal standards for submitted documents. Further, many

43. Chih-Ming Chen & Yu-Ju Lin, *Effects of Different Text Display Types on Reading Comprehension, Sustained Attention and Cognitive Load in Mobile Reading Contexts*, Interactive Learning Environments (2014).

44. *Id.* at 9.

court rules require that a document contain certain elements, but do not forbid the inclusion of elements that go beyond those requirements.

This essay is too short to address all of the concerns that a legal writer must consider while writing a brief or other legal document.⁴⁵ Generally, the same analytical elements should be included in any brief, whether it is read in paper or digital form. Likewise, certain structural signals are important for both readers and users. This section will address writing and presentation techniques that should vary for digital documents or that are particularly important for digital documents.

In particular, digital writers should (1) use phrases-that-pay⁴⁶ and other crucial words in a way that accommodates computer searches; (2) choose reader-friendly software, and use digital-friendly enumeration techniques for pages and headings; (3) use internal and external links mindfully; (4) consider delivering digital or paper “working copies”; and (5) ease life for users by including a table of contents and by focusing on the “template” items of headings, topic sentences, roadmap paragraphs, and internal conclusions;

2.2.1 Use Phrases-that-Pay and Other Crucial Words in a Way that Accommodates Computer Searches

In analytical writing like briefs to a court, almost every legal issue focuses on the meaning of a key word or phrase. I refer to this key term as the “phrase that pays,” and I recommend that all writers identify at least one phrase-that-pays in each section of their documents. In legal writing, it is always important to avoid elegant variation—the use of synonyms for mere elegance as opposed to a change in meaning.⁴⁷ The better rule is to use the same term to refer to the same thing, and

45. For more detailed advice, see Beazley, *supra* n. 26 and Mary Beth Beazley & Monte Smith, *Legal Writing for Legal Readers* (Wolters Kluwer 2014).

46. I use this term simply because I find it more appealing to say “phrase-that-pays” than to say “key terms.” Beazley, *supra* n. 26, at 67–71; *see also* Richard K. Neumann & Kristen Konrad Tiscione, *Legal Reasoning and Legal Writing* ch. 2 (7th ed., Aspen 2013) (discussing use of “key terms”).

47. *See e.g.* Richard Wydick, *Plain English for Lawyers* 57 (Carolina Academic Press 1979).

different terms to refer to different things.⁴⁸ This requirement is even more important when writing for digital readers,⁴⁹ who may be using a search function that will light up every use of a term and allow them to hop from term to term to term. In addition to the actual phrase-that-pays for each legal issue, writers should consider what other terms the reader might look for in the document. For example, if the case has crucial factual issues, they should use consistent language to describe those crucial facts.

2.2.2 Choose User-Friendly Software and Use Digital-Friendly Enumeration Techniques for Pages and Headings

Because consumers of digital documents may skim and scan or click through the document by jumping from key term to key term, their lack of physical connection with the document can interfere with their structural comprehension. If possible, writers should use software that displays a linked table of contents along the left side of the screen. Doing so allows the reader to consider how current content fits into the overall argument. Internal links allow users and readers to jump from their current location to an earlier or later section.⁵⁰

When paginating the document, writers should consider using “Page 1 of 16” rather than “Page 1” so that a reader who glances at a page number is given an orientation to the whole document rather than just one part of the document. Likewise, when enumerating headings, writers might appropriately abandon Roman enumeration (I.A., I.B., II.A, II.B), and substitute scientific enumeration (1.1, 1.2, 2.1, 2.2).⁵¹ Digital

48. Lynn B. Squires, Marjorie Dick Rombauer & Katherine See Kennedy, *Legal Writing in a Nutshell* 102–03 (2d ed. West Group 1996). As some readers may recall, Professor Rombauer “founded the teaching of legal writing as a professional discipline.” Mary S. Lawrence, *An Interview with Marjorie Rombauer*, 9 Leg. Writing Inst. 19, 19 (2003). Hers was the first legal-writing textbook to reach a wide audience. *Id.* at 44–45 (noting that Rombauer’s textbook was adopted by thirteen law schools upon its release in 1968, and was still selling as recently as 2003).

49. Beazley, *supra* n. 26, at 249–50.

50. Of course, internal links should always allow readers to easily navigate back to their previous location. *See infra* § 2.2.3.

51. Daniel Sockwell, Student Author, *Writing a Brief for the iPad Judge*, CBLROnline, *Announcements*, <http://cblr.columbia.edu/archives/12940> (Jan. 14, 2014) (accessed June 11, 2014; copy on file with Journal of Appellate Practice and Process).

readers who jump to a phrase-that-pays in a heading labeled “C” will not know where they are in the document; in contrast, if the heading is labeled “2.3,” readers will know that they are in the third sub-section of the second part of the document. Further, if the document also includes a linked table of contents to the left, it is easy for readers to understand how this section fits into the document as a whole, particularly if that table of contents highlights readers’ current location.

2.2.3 Use Internal and External Links Mindfully

The use of links (a/k/a hotlinks or hyperlinks) can provide many benefits to courts or other readers. External links can allow readers to get more details about law and facts, or to easily verify the validity of a writer’s arguments. Internal links can allow the reader to navigate easily within the document.

As noted above, however, links have a cost. When readers or even users encounter a link within text, they have a decision to make: to click or not to click? Each link, therefore, adds to the reader’s cognitive load. Also, external links can lead the reader away from the writer’s document and arguments to other documents that may or may not advance the writer’s goal. If the new external document also contains hyperlinks, the reader may move farther and farther away from the writer’s argument.

Accordingly, careful digital writers should consider avoiding all external links. Rather than creating a link to an external document, writers can copy the needed document into an appendix and create a link to the document there. To avoid increased cognitive load in a brief, writers might also avoid links within the argument itself. As noted above, each link presents the reader with a decision that can interfere with effective reading. To allow access but avoid interfering with reading, writers can include the links within a table of contents (i.e., a table of contents to the appendix) or a table of authorities.

Writers who believe that the information at the link may be needed during reading can consider using some form of a pop-up note. Many kinds of software allow the writer to “attach” a note to a particular location in the document. When the reader hovers the mouse over the note icon, the information “pops up” into the text, allowing the reader to see the information in

context, with easy navigation back to the text after finishing the note.

A final note about footnotes: For reasons too numerous to list here, I side with the majority of judges who dislike the use of footnotes in the text of a brief.⁵² If a footnote is necessary, however, writers have two digital-friendly options. First, they can use a pop-up note, as recommended above. If a pop-up note is inappropriate, they can create a linked footnote, and make sure that the footnote has a link back to the text. This method reduces cognitive load and ensures that the reader spends less time navigating and more time reading.

2.2.4 Consider Delivering Digital or Paper “Working Copies”

In the past, many courts included requests for “working copies” in their court rules or guidelines. Because courts could not mark up the official copy filed with the court, they needed extra copies that they could highlight and annotate, and the working copies filled the bill. Now, in contrast, many courts forbid counsel from submitting paper working copies. These rules are probably a result of the movement for paperless chambers, a movement that has the laudable goal of reducing the environmental impact of litigation.⁵³

As I indicate below, however, I think that courts should consider requesting digital working copies. Many courts still have paper-based formatting rules that require double-spacing, one-inch margins, and the like. Courts may keep those rules as they desire, but writers should be able to submit digital working copies that are formatted in a more digital-friendly way. Double-spacing, for example, is rarely reader-friendly to the digital reader because digital documents are typically read on smaller screens. Further, wider margins on the right side allow readers to annotate documents without changing original pagination.⁵⁴ If

52. Beazley, *supra* n. 26, at 144–45.

53. The use of printed briefs has a significant impact on the environment. Ruth Anne Robbins, *Conserving the Canvas: Reducing the Environmental Footprint of Legal Briefs by Re-Imagining Court Rules and Document Design Strategies*, 7 J. Assn. Leg. Writing Dirs. 193, 195 (2010).

54. Professional designers generally recommend leaving the right third of a page free for optimal line length and white space; this conventional wisdom, of course, provides the serendipitous benefit of giving readers room for comments.

courts allow—or do not explicitly forbid—the submission of digital working copies, writers should consult with the appropriate court personnel to determine how best to submit these documents.

2.2.5 Include a Table of Contents and Focus on the Template

Other than providing appropriate content, the next most important thing the legal writer can do is to send accurate signals as to the structure and content of the document, and to do so in the places that the reader (and user) will be looking for those signals. Likewise, digital writers should write and design their documents to make it easy for the reader to find those elements.

As noted above, I recommend that digital readers review a table of contents to give themselves context before they begin to read. Many courts, however, require a table of contents only if documents reach a certain length. Most digital writers would be wise to include a table of contents for all documents of more than a few pages, both to help orient readers and to provide finding tools for users. Further, if writers are aware of the reader's software, they should be sure to format their documents to take advantage of any features such as linked tables of contents and the like.

I have long advocated particular attention to a list of items that I refer to as “the template” of the document. The elements of the template mark the places in the document that readers are most likely to consult when deciding where and whether to continue reading: the headings; the topic sentences; the roadmap paragraphs; and the internal conclusions.⁵⁵ By exploiting the items in the template, writers make it easier for digital and paper readers to find, read, and comprehend their documents.

2.2.5.a Use Substantive Headings of an Appropriate Length, and Use Bold-Faced, Mixed-Case Type

Legal writers have long been advised to use substantive headings, and this advice grows ever more important as we

55. See generally Beazley, *supra* n. 26, at ch. 10.

move to the digital world. Ideally, each heading will be a focused sentence that conveys the substance of the information that follows, and uses relevant phrases-that-pay. In the fact statement, headings should include fact-based key terms; in the argument, the headings should convey the structure of the argument. By reading the headings alone, the reader should be able to understand not only the issues that the brief addresses, but also the writer's position on those issues.

The most effective headings tell the court either something that the advocate wants the court to do ("This court should find that Officer Perek provided adequate Miranda warnings") or something that the advocate wants the court to believe ("Officer Perek's Miranda warnings were adequate"). When possible, the heading should, like Example 3 in the following series of sample headings, also provide a reason for the action or the belief. The following examples, which proceed from a less-effective minimalist approach to a comprehensively informative construction, illustrate these points.

Example 1, signaling the subject but not the writer's position:

1.1 Reasonable suspicion is established by examining the totality of the circumstances.

Example 2, signaling both the substance and the writer's position:

1.1 Officer Perek had reasonable suspicion that justified the dog sniff.

Example 3, providing a reason for the action or belief at issue:

1.1 Reasonable suspicion justified the dog sniff because the behavior Officer Perek cited was sufficiently connected to Defendant.

Writers must also consider heading length, for many readers will skip a heading that is too long. The definition of “too long” may be a bit hard to pin down, however. Conventional wisdom has held that most readers skip headings that are longer than three lines, and that many skip those that are longer than two lines. This advice may not hold for digital readers, however, and especially for digital users. If users are skimming and scanning, dipping into the text to review a heading and then decide whether to read the text, they may be willing to read a longer heading. Thus, writing a heading of four or even five lines may pay off: *Readers* may skip those headings, but they may catch the attention of *users*. Even if the user does not read the accompanying text, the longer heading gives the writer a better chance to communicate content to the skimming and scanning user.

Some courts, alas, still imply or require that point headings should appear in all-capital letters.⁵⁶ The standard evolved in this way for many reasons,⁵⁷ but none of them are relevant now. What is relevant is that readers often skip all-caps text—or leave the document—rather than try to decipher it, simply because all-caps text makes the meaning of words hard to grasp.

56. *E.g.* N.Y. S. Ct., 2d Jud. Dept., App. Div. R. § 670.10.3(a) (providing that “[e]xcept in headings, words may not be in bold type or type consisting of all capital letters”); N.C. R. App. P., Appx. B (providing that “[t]he various sections of the brief or petition should be separated (and indexed) by topical headings, centered and underlined, in all capital letters”); *see also* Ohio 11th Dist. App. R. 16(C)(4) (illustrating correct statement of assignment of error by rendering example in all-capital letters: “The Assignments of Error shall assert precisely the manner in which the trial court is alleged to have erred, e.g., ‘THE TRIAL COURT ERRED IN OVERRULING APPELLANT’S MOTION TO SUPPRESS HIS CONFESSION FROM THE EVIDENCE.’”). Further, a quick review of briefs recently filed online reveals that many writers are still using all-capital letters, especially for main headings. *See e.g.* Br. of Appellant, *Hapting v. AT&T Corp.*, No. 06-17132 (9th Cir. Mar. 9, 2007) at 22 (rendering the first main heading in the argument section thus: “LITIGATION MUST BE DISMISSED WHEN THE STATE SECRETS DOCTRINE PRECLUDES THE PARTIES FROM FULLY AND FAIRLY LITIGATING THE THRESHOLD ISSUE OF STANDING”) (available at https://www.eff.org/files/filenode/att/att_opening_brief.pdf) (accessed Oct. 7, 2014; copy on file with Journal of Appellate Practice and Process).

57. *See e.g.* Ruth Anne Robbins, *Painting with Print: Incorporating Concepts of Typographic and Layout Design into the Text of Legal Writing Documents*, 2 J. Assn. Leg. Writing Dirs. 108, 116 (2004) (referring to lawyers’ desire to introduce contrast into the typography of their briefs and the ability of typewriters to create it only through capital letters).

There is some controversy about the reasons for the difficulty; a recent theory, which could be called the letter-shape model, makes sense to me. Scientists who have studied the process of reading believe that when we read, we see only a few letters sharply.⁵⁸ But that is not all that we see. At the same time that we are seeing a few letters sharply, our peripheral vision is sweeping ahead to see what is coming. Unfortunately, our peripheral vision is unfocused and blurred.⁵⁹

When seen through unfocused eyes, then, capital letters appear to be fuzzy rectangles: All capital letters start at the baseline and rise to the top of the line; when blurred, they are hard to distinguish from each other. Lower-case letters, in contrast, have distinguishing features that make them easier to identify. Many lower-case letters (b, d, f, h, i, j, k, l, and t) have ascenders that rise, or ascend, above the middle of the line. Others (g, j, p, q, and y) have descenders that dip, or descend, below the baseline. Because their shapes are more distinctive, lower-case letters can be read even when blurry. Thus, when we read a paragraph of text set in all caps, we feel as though our reading has ground to a halt because we can read only the few letters that appear directly before our eyes; our peripheral vision is useless.⁶⁰

Accordingly, instead of using all-caps text for emphasis, use bold-faced type. Bold-faced type draws the attention of both readers and users; it can be spotted even by those who are scrolling rapidly through the documents. It is better for emphasis than italics, which can be missed by scrollers, and is also better for emphasis than underlined text, which can obscure descenders.⁶¹

58. See e.g. Ralf Herrmann, *How Do We Read Words and How Should We Set Them?* <http://opentype.info/blog/2011/06/14/how-do-we-read-words-and-how-should-we-set-them> (June 14, 2011) (accessed Sept. 15, 2014; copy on file with Journal of Appellate Practice & Process) at 2.

59. *Id.*

60. See *id.* at 7–8 (discussing difficulties associated with decoding all-caps text).

61. E.g. Robbins, *supra* n. 57, at 118 (citations omitted).

2.2.5.b Use Phrases-that-Pay in the First Sentence of Each Paragraph

Skimmers and scanners will look to the first sentence in each paragraph to determine whether the paragraph is worth reading. Focus that sentence on the paragraph's thesis, and think of it like the label on the drawer.⁶² Make sure that it accurately signals the paragraph's contents. Like headings, thesis sentences in the argument section should be substantive and argumentative. By including phrases-that-pay in thesis sentences, digital writers can draw attention to these sentences from readers who are using keywords to skim through the document.

2.2.5.c Include Explicit Roadmap Paragraphs, with Numbers to Signal Upcoming Segments

Roadmaps perform the crucial role of providing context for all readers.⁶³ Digital readers are more likely to notice roadmap paragraphs for two reasons: (1) Roadmap paragraphs appear early in each section of the argument; writers should include a roadmap anytime they are breaking a segment of an argument into two or more subsections. The presence of a small section between two bold-faced headings can thus draw the reader's eye. (2) The use of enumeration (rather than word signals such as "first" and "second") can also draw the reader's eye. Readers who are skimming through the document and trying to decide which sections to read can look to the enumerated roadmap to provide an overview and inform their decisions as to what section of the document to go to next.

2.2.5.d Include Explicit Internal Conclusions that Connect the Current Section to the Overall Thesis

Digital readers in satisficing mode tend to read beginnings and sometimes middles rather than conclusions. Nevertheless, explicit internal conclusions can be useful for digital readers. By

62. *E.g.* Beazley, *supra* n. 26, at 233–37.

63. *E.g. id.* at 239–41; 243–46.

definition, internal conclusions appear above the heading for the next section of the document. A digital reader who starts at a heading and needs more context can review the internal conclusion in the preceding paragraph. If it is effectively written, the internal conclusion will not only include the conclusion to that section of the document; it will make clear how that conclusion affects the document's goal.⁶⁴

2.3. *What Courts Should Be Doing Differently*

Appellate judges and their clerks act as digital readers when they consume digital briefs, and they might consider the behaviors recommended above when they read. Courts also, of course, design the local rules and standing orders that attorneys must follow when they write and submit digital briefs. Courts can thus make their cognitive load lighter by mandating rules that make their reading easier. Courts looking to amend their local rules can consider a variety of digital-friendly changes:

- Digital readers will have an easier time if they review a table of contents before starting to read. Accordingly, courts might require a table of contents in all documents.
- Although scientific numbering is an aid to the digital reader, attorneys might not feel free to switch from more traditional numbering systems. Accordingly, courts might explicitly recommend scientific numbering as a way to promote comprehension.⁶⁵
- Courts have always used personal preferences when enacting rules for working copies. Accordingly, courts might take into account the devices used in the courtrooms of particular judges, tailoring requirements for digital-friendly formats such as single-spacing, wide right-hand margins, or

64. See e.g. *id.* at 246–47.

65. See Sockwell, *supra* n. 51.

particular fonts to the particular devices that their judges use.⁶⁶

And when judges themselves are writers, they can take steps to improve the digital readability of their opinions. This means following the writing advice noted above—in particular, the advice to use substantive headings—and the publishing advice noted below. Many courts are now publishing their opinions on court websites, and they should take advantage of the versatility of the digital platform to promote readability and increase reader comprehension.

*2.4. What Digital Databases Should Be Doing Differently*⁶⁷

Like most legal readers, appellate judges and appellate lawyers do most of their research on digital platforms. They may encounter court opinions on Lexis, Westlaw, or Bloomberg Law; they may use platforms such as Casemaker, which is available as part of many state bar memberships; or they may go directly to court websites. These digital platforms provide many benefits to readers, including searchability and ease of access through many different devices. But digital providers should consider what else they can do to use digital features to bridge the gap between digital reading and hard-copy reading. In particular, digital publishers should include features that (1) help researchers identify the best authorities from among those that fit the search; (2) help researchers refine and improve their searches as they go; and (3) help researchers when they return to a previously-completed search or previously saved and annotated materials.

66. Regardless of the rules regarding digital working copies, courts should hesitate before mandating a completely paperless process. If a particular document is hard to understand, some readers might benefit from reading a paper version of the document.

67. This section addresses only a few of the possibilities for digital-database providers. Readers should be aware that scholars are continually conducting significant research on how readers actually conduct and use digital research. *See generally e.g.* Michitsugu Yamauchi & Akifumi Tokosumi, *Three Behavioral Models of Web Searching for Legal Information*, in Proceedings of the 10th Intl. Conf. on Info. Integration and Web-based Applications & Servs. 579 (2008); Bhuva Narayan & Michael Olsson, *Sense-Making across Space and Time: Implications for the Organization and Findability of Information*, in *Proceedings of the 76th ASIS&T Annual Meeting: Beyond the Cloud: Rethinking Information Boundaries* (2013).

When researching, digital readers benefit from features that aid their decisionmaking process. For example, two of the most important data points about court opinions are the date of the decision and the level of the court. Most databases display the caption in a format that starts with the citation and the name of the case. The reader may be able to deduce something about the level of the court from the citation, but may need to scan through the citation information to find the crucial specifics about the court and the date. Providers should recognize the significance of this information, and they should create a “validity stripe” at the top of the page that highlights the date, the court, and the publication status (i.e., reported or unreported) of each case.⁶⁸ The validity stripe could even float at the top of the electronic display of each page, even in the middle of the opinion, as may be true when a reader enters an opinion by clicking on a link from another document. And providers might also consider using specific background colors of validity stripes for cases reported from specific levels of courts, uniformly using one color for the highest court in the jurisdiction, another for its intermediate appellate courts, and a third for its trial courts.

In addition to knowing the court and the date, researchers and other readers need to know whether particular information is in the majority or dissenting opinion. Most databases let readers restrict Boolean searches to majority, dissenting, or concurring opinions. However, if a reader has linked to the middle of an opinion, the only way to verify whether language is part of the majority opinion is to scroll or page up, looking for a line of text that signals the move from majority to non-majority opinion. Admittedly, researchers should never rely on language from an opinion without reading the entire opinion, and reading an entire opinion is undoubtedly the best way to verify the validity of a court’s language. The reality, though, is that legal readers are in a hurry, and current technology may link them to a dissenting opinion, either via a link from another document, or by letting them jump to the various uses of a search term in a single reported case. Database providers should accordingly develop a system of signaling non-majority opinions. They could, for

68. The idea of a validity stripe comes from Professor Anne Enquist, of Seattle University School of Law.

example, use no shading for majority opinions, but run light grey shading behind the text of plurality opinions, light blue shading behind the text of concurring opinions, and light red shading behind the text of dissenting opinions. The line of demarcation between different colors, or between no shading and some shading, would make it easy for digital readers to identify the start of any non-majority opinion. In addition—or in the alternative—providers could use electronic watermarks or similar running labels to differentiate types of opinions from one another.

Database providers can also help support researchers' decisionmaking by expanding the way in which a list of search results shows a portion of the key words in context. Because this list is usually limited in some way, all of the listed documents tend to look the same. But if each entry showed *all* of the uses of the key words in context,⁶⁹ researchers could tell at a glance which of the documents discussed their search terms in the most depth or detail. Likewise, they could instantly assess the types of results that their searches were drawing, and make a judgment about the effectiveness of each search.⁷⁰

This kind of feature is particularly helpful because digital researchers must decide on a breadth-or-depth approach. Studies of Google-type searches, for example, show that researchers decide whether to satisfice, and read the first document that seems to be helpful, or to review search results before making a choice. In an Australian study, searchers using larger screens usually explored more choices before clicking on links (a breadth-first strategy); searchers using a smaller screen were likely to click through to the first apparently useful link (a depth-first strategy).⁷¹ Researchers hypothesize that searchers on

69. The “show hits” feature on Lexis displayed this information; Lexis Advance features a set of hits that displays the documents as seeming very similar to each other, which does not support decisionmaking nearly as effectively.

70. Some have suggested that database providers hope to draw researchers into more clicks, and thus more cost, by giving them less-than-helpful information. If this is the case, providers should not be so certain that researchers will continue to click after being directed to a few unfruitful cases. The database provider that allows more useful search methods and delivers more useful results may draw more customers. If most researchers conclude that for-profit database providers are purposefully using techniques that inhibit effective legal research, they may turn to government databases or providers of ad-supported databases, who may upgrade their products to fill the gap.

71. Kim, et al., *supra* n. 28, at 29.

the small screens chose a depth-first strategy because they could see only three or four results on the initial screen (as opposed to ten on the large screen).⁷² Data that signals the usefulness of the source—like court, date, and volume, or number and context of search-term hits—can help researchers to make better decisions when they encounter that first screenful of results.

Database providers should also consider both neuro-spatial and behavioral issues when they design annotation, folder, and searchability functions. For example, hard-copy researchers may amass piles of cases with highlights and notes that mark important language: They may not remember the names of particular cases, but may remember language that was in an important case, or have a neuro-spatial memory of approximately where the case sits in the stack or where on the page the important language appears. With a physical stack of cases, the researcher can easily flip through the cases, looking at the remembered spot on various pages, trying to find the appropriate language.

Digital databases, in contrast, allow readers to create a virtual stack of documents in files or folders, often without providing a way of searching these virtual document stacks. It would be helpful if databases could be engineered to enable researchers to search for key terms in their stored files or in the annotations to those stored files. Likewise, it would be helpful if researchers could scan through a list of terms that they have highlighted in stored documents, and then click on particular terms to in order to be linked to the stored cases in which those terms are discussed.

As technology advances, more and more databases are likely to allow for sophisticated search techniques. The most useful databases will be those that provide realistic support for the research and writing of busy—and human—judges and attorneys.

3. CONCLUSION

We can't let the development of the computer chip do to our brains what the development of the wheel has done to our

72. *Id.*

bodies. In prehistoric times, people didn't have to worry about the health of their cardiovascular systems. We stayed in shape by hunting and gathering, building fires, and running away from wild animals. With the invention of the wheel, the car, the television, and the sofa, however, the physical exercise that used to happen naturally has all but disappeared. To stay in shape in the twenty-first century, we have to affirmatively seek out opportunities to move our bodies.

Likewise, lawyers can't stop reading and thinking deeply just because it's easier to do a new search every time we need to know something. Some of the new technologies mentioned in this article can help us to maintain our mental abilities, but we have to do our part. Gym memberships don't keep our bodies in shape unless we actually go to the gym and exercise. Likewise, better software won't keep our brains in shape unless we commit to being active readers, and mentally engage with the law and the facts.

It is crucial that scholars gain an increased understanding of how appellate lawyers and appellate judges read and use digital writing so that we can ensure that our legal system does not sacrifice substance or effectiveness to ease and accessibility. By understanding how our brains work when we read and write legal documents in digital form, digital readers, writers, and content providers can better design these documents, and judges and lawyers can better use the information that they contain. Current studies have focused almost exclusively on students, and on knowledge workers other than lawyers and judges. It is time to broaden that research so that we can have a valid understanding of how the legal system can best to move forward with modern reading and writing technologies.

In the interim, current research indicates that our brains may work better—and we may work harder—when we use paper documents than when we use digital documents. But these behaviors are not necessarily permanent. And because digital documents are not going away, appellate lawyers and appellate judges need to learn how to read them—and write them—more carefully.