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# Book Review: Interactive Information Retrieval in Digital Environments by Iris Xie

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# Book Review

**Handbook of Research on Web Log Analysis.** Edited by Bernard J. Jansen (Penn State University); Amanda Spink (Queensland University of Technology); and Isak Taksa (Baruch College, City University of New York). Hershey, PA: Information Science Reference, September 2008. 628 pp. $265.00 (ISBN: 978-1-59904-974-8).

Web log analysis, like my own area of webometrics, is a relatively new Web-based, primarily quantitative set of approaches of growing importance to information scientists. With the shift in service provision to the Web, libraries and archives need to engage with quantitative techniques to assess the impact and effectiveness of their online resources and information. Moreover, information scientists need to research Web use as an important aspect of information behavior, and Web log analysis should be a part of this. Hence, the release of this large volume with multiple log file analysis methods and case studies is particularly welcome to support new teaching in the subject. While the use of Web server log file analysis programs is covered in the professional literature—often described as Web analytics—this volume gives a researcher's perspective in terms of both methods and case studies.

The heart of the book covers Web server log file analysis from individual Web sites, but transaction logs based on user actions across multiple Web sites (recorded by tracking software on PCs or by Internet service providers), and the analysis of search engine query logs also are included. The book is explicitly research-oriented, in contrast to commercially oriented Web analytics manuals. Nevertheless, several chapters are written or coauthored by commercial experts, which gives a welcome additional perspective and emphasizes the wider relevance of the book, despite its research orientation.

This reference work is split into five main sections. The first section (Perspective, Issues, and Directions) introduces the key ideas and generic issues such as ethics. Chapter I sets a research context for "transaction log analysis," drawing on the concept of behaviorism. It particularly emphasizes the advantages of unobtrusiveness, for example, in avoiding the Hawthorne Effect. In contrast, chap. II gives an overview of Web log analysis from a historical perspective, drawing upon pre-Web transaction log analysis. This chapter gives insights into methods and methodological issues. Chapter IV discusses the value of surveys as a complement to Web log analysis. This is a useful addition, although its study does not really engage in a detailed analysis of the kind of extra information that surveys can deliver. Chapter IV makes an intelligent case for limitations for the use of Web log data in research. It mainly addresses the commercial Web analytics literature, so the chapter is actually not primarily tackling the academic Web log analysis that is the main theme of the book. In addition, I am not sure that "the unspoken belief within web-traffic measurement is that those keystrokes and mouse clicks represent the sum total of what there is to know about a web site visitor's experience" (p. 70) is fair and think that the mostly unspoken assumption is probably that keystrokes and mouse clicks provide sufficient evidence on their own to make intelligent decisions for Web site design optimization purposes and perhaps also for Web marketing. Nevertheless, this chapter is valuable context for all academic Web log file analysis researchers, and should serve as a reminder for commercial practitioners and researchers that Web log files do not tell the full story of the user experience. This is well captured by the chapter's final paragraph. Concluding section I, chap. V surveys ethical and privacy issues relevant to Web log file analysis in a very practical way that will aid researchers designing ethical studies.

The second section discusses methodological issues and metrics, giving advice and insights into methods for the three types of Web log analysis covered. This reflects the behavioral orientation of the book that in my view is particularly welcome, and should help Web information behavior researchers to adopt the technology. Section three (Behavior Analysis) explicitly focuses on user behavior, and discusses methods for tracking and analyzing this through Web log analysis. The fourth section discusses methods for analyzing search engine query logs. This primarily deals with commercial search engines, but one chapter instead focuses on MEDLINE. The concluding section introduces some more specialist topics that are probably not relevant to most users and contains a concluding chapter. I do not see how blog analysis can reasonably be claimed as a form of transaction log analysis, and therefore question the inclusion of chap. XXIII. In addition, chap. XXIV seems rather peripheral, except for the section contrasting ethnography and web log analysis on p. 494.

Overall, the book is well-written and well-edited, and forms a coherent whole. A couple of the chapters seem a little substandard, but otherwise the level was good. Although some chapters are quite technical, most are quite accessible to the nonspecialist. It seems to give fairly comprehensive coverage of information science research-based approaches to log file analysis. Although the book strays into what I would see as nonresearch, commercial applications, this is actually an asset as long as the reader takes care to differentiate between the two. As a minor niggle, about 9% of the book contains pages of duplicated references because each chapter's references also are collated at the end. While this is useful, the publishers could have edited the work to remove each chapter's reference sections. In conclusion, the editors have pulled together an impressive and useful collection that gives significant value to interested researchers and should help to widen the popularity of Web log analysis. The book is priced as a reference volume for libraries, and fills this role well. It is essential library support for relevant courses and researchers.

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**Interactive Information Retrieval in Digital Environments**, Iris Xie. Hershey, PA: IGI Publishing, 2008. 351 pp. $99.95. (ISBN: 978-1-59904-240-4).

Let me start by admitting I read too few books—nonfiction books, that is. When I travel (by plane; 2–3 times per week) between the two divisions of the Library School in Denmark, I normally treat myself with fiction literature; if my reading is work-related, then it is mostly scientific journal papers and rarely monographs. Which is why my expectations to the present book were relatively high—having finally made time for

the reading of a book, I thought it better be a (very) good book (and not a waste of time).

The big question is how high my expectations were, and did I ever leave the present book a fair chance to meet my expectations and satisfy my need?

There is no need to keep you waiting: I like the book—for good and for worse! Therefore, I have no problems in recommending the book to my colleagues and students (master's and doctoral). In the following, I further explain what I like about the book and what I found less likeable, as it should be no secret that the book did not fully meet my expectations. Nevertheless, it does hold qualities that make it recommendable for others to read. The book is well-written, and has a clear and logical structure [though it does resemble the structure of a doctoral thesis, which is of no surprise as the present book builds on the author's doctoral work (p. xvi)].

The review is structured as follows: First, I present the topic and objective of the book according to the author, and supply my viewpoint. The following section concerns the intended target group of the book. Hereafter, I present how the book is compiled and structured, and let you know how well I think it works. Finally, I present you with my overall opinion of the book, with reference to the expectations I had.

## Topic and Objective of the Book

This is a book on user-oriented information retrieval (IR) and information-seeking (behavior); it is a book that presents a comprehensive review of relevant, previous literature on IR interaction and seeking models and studies undertaken with reference to the various IR environment of OPACs, online databases, Web search engines, and digital libraries.

From the back of the book, it reads that the book discusses ". . . how to evaluate interactive information retrieval systems," and that the reader ". . . will gain the foundation for new research on this subject matter, and guidance to evaluate new information retrieval systems for the general public as well as for specific user groups."

According to the author (p. xvi), the objective of the book ". . . is to develop a theoretical framework for information retrieval (IR) interaction and to further discuss its implications in the design and evaluation of IR systems in the digital age." On page xxvi, the author explicitly notes how the objective of the book—the heart of the book—is to present the author's own model, an interactive IR framework labeled the *planned-situational interactive IR model*. To be precise, the main focus of the book is on reviewing relevant literature in support of the planned-situational interactive IR model, and less on the implications for design and evaluation—to be correct, the book hardly discusses how to evaluate (interactive) IR systems. The objective of the book is to present the author's model and viewpoint. This is achieved very convincingly.

## Target Group of the Book

According to the author, the book is intended for researchers, designers, teachers, graduate and undergraduate students, and professionals who are interested in interactive IR. Taking into consideration the format and the theoretical level of the book, I would personally recommend the book to academic colleagues and students of mine with some knowledge of user-oriented IR and information-seeking (behavior) research. Having just touched upon the book's format, I will continue with the structure of the book.

## Structure of the Book—and the Chapters

The book is composed of 11 chapters (Page counts include bibliographic references.) These are:

chap. I: User-Oriented IR Research Approaches (28 pp.)
chap. II: Interactive IR in OPAC Environments (26 pp.)
chap. III: Interactive IR in Online Database Environments (29 pp.)
chap. IV: Interactive IR in Web Search Engine Environments (32 pp.)
chap. V: Interactive IR in Digital Library Environments (36 pp.)
chap. VI: TREC and Interactive Track Environments (29 pp.)
chap. VII: Interactive IR Models (31 pp.)
chap. VIII: Interactive IR Framework (47 pp.)
chap. IX: Illustration and Validation of the Interactive IR Framework (30 pp.)
chap. X: Implications of the Planned-Situational Interactive IR Model (39 pp.);
chap. XI: Conclusions and Future Directions (13 pp.).

As said previously, the composition of the book resembles a doctoral thesis in that it starts out by reviewing previous research (chaps. I–VII), then presents its case of the planned-situational interactive IR model (chap. VIII), moves on with validation and discussion of the framework/model presented (chaps. IX–X), and closes with conclusions and future work (chap. XI). The consequence of this composition is redundant literature reviewing in the chaps. VIII to X when the proposed model is positioned, illustrated, and validated. Taking into consideration the focus and objective of the book, it would—in my opinion—have been more convenient and effective to simply start out by presenting the planned-situational interactive IR model in chap. I and hereby illustrate the qualities of the model/framework in relation to the digital environments of OPACs, online databases, Web search engines, and digital libraries (chaps. II–V), which are left as rather unsolved cases as it is. Chapters I to VII review relevant literature and provide for support of the planned-situational interactive IR model presented in chap. VIII.

Personally, I like chaps. II to V because they very well describe the various IR system settings (OPACs, online databases, Web search engines, and digital libraries), their characteristics, and previous, relevant work. These chapters will be (should be) of interest to students and younger colleagues to whom the Web with Google as an example is the predominant IR system.

Chapter VII presents and discusses the most essential user-oriented (interactive) IR models: Ingwersen's Cognitive Model, Belkin's Episode Model, and Saracevic's Stratified Interaction model. Followed by central information-seeking models: Ellis' Model of Information-Seeking Behaviour; Bate's Berrypicking Approach; Vakkari's Theory of the Task-Based IR Process; Spink's Model of Interactive Feedback; Hert's Model of IR Interaction in Relation to the Larger Information-Seeking Process; Wang, Hawk, and Tenopir's Multidimensional Model of User–Web Interaction; and Pharo's Search Situation and Transition Method. The models are classified and distinguished as macro- (the models by Ingwersen, Belkin, and Saracevic) and microlevel models (the information-seeking models) with Pharo's contribution positioned as method and Hert's model as the one that unites both the macro- and microlevel models of interactive IR. Figure 7.7 (p. 205) very nicely illustrates the classification of the models, which forms the basis for the introduction of the interactive IR framework of the planned-situational interactive IR model in chap. VIII.

'The planned-situational interactive IR model is depicted in Figure 8.1 (p. 216) and appears at first sight as just as macro-level-oriented as the models by Ingwersen, Belkin, and Saracevic, but is subsequently explained and elaborated on in a very systematic, consistent, coherent, and comprehensive manner. The proposed framework is illustrated and validated in chap. IX, and chap. X discusses the implications of the framework, not the least with reference to design recommendations for interactive IR systems.

The main criticism against the macrolevel models by Ingwersen, Belkin, and Saracevic, presented in chap. VII, is that the models are not empirically validated and do not suggest recommendations for system design. This calls for a closer look at the proposed model and framework. First, it is true that the models by Ingwersen, Belkin, and Saracevic are

not empirically validated but are, however, developed and verified on the basis of previous research—just like the author builds her model on the basis of previous research, including these models. Second, these models are not developed with the purpose of providing system-design recommendations, and can hardly be held responsible for not providing any. As for the proposed framework, the validation of the model is far from sufficient and is by the author appropriately referred to as a pilot study (p. 263). The validation study reported is based on 21 information-study students writing research proposals for a final project, which makes the author note the need ". . . to recruit more subjects representing general users of different types of IR systems with various ethnic backgrounds, education and literacy levels, computer skills, occupations, and other demographic characteristics" (p. 291). Additionally, different search situations, tasks (i.e., types and levels of complexity), information needs, and topical and professional domains could be added. Design recommendations are presented on pages 299–301 and 311–312, with a strong preference towards help support of system usages.

## My Opinion of the Book

What did I expect? I expected an objective book on interactive IR in digital environments for the research field of library and information science: a book that illustrates the need for user-oriented IR and carefully discusses the problems and complexity in the "art" of conducting user (-involving) studies in the context of interactive IR environments, a book that would provide a state-of-the-art overview of this very complex domain, and a book that provides constructive recommendations about how to deal with issues of interactive IR in various digital environments and provides guidance in how to evaluate in settings as complex as these.

So what did I get? I got a less objective book than expected. The present book has a very clear agenda of introducing the author's framework of the planned-situational interactive IR model and of promoting the author as a central contributor to the area of interactive IR research. This clear agenda of self-promotion results in a heavy self-citation practice, which at places become redundant and in other cases overwhelming. As for the author's position, there is no doubt she is a central contributor to the research field of user-oriented, interactive IR. Her framework has potential and is very promising, and further validation will strengthen the model and the future application of it. The qualities of the book are, in addition to the potentials of the proposed framework, the thorough and comprehensive literature reviews in relation to user-oriented IR research approaches, the studies and contribution within the digital IR environment of OPACs, online databases, Web Search engines, and digital libraries. The review of TREC and the interactive track is likewise very good and presents a nice overview. But in particular, I liked chap. VII, which reviews the central interactive IR and information-seeking (behavior) models—all nicely summarized in Figure 7.7.

I also would have liked—and did expect based on the back-of-book-announcement—the book to be more concrete with recommendations about how to evaluate interactive IR systems, but from my own experience, I also know how difficult it is to come up with general recommendations when the context of testing constantly differs according to research focus, test purpose, and system (facilities) in question—not to mention the users.

Though the book did not fully meet my expectations, it did not disappoint me. Reading it reminded me of how many we are who find user-oriented IR and information-seeking research important. The book made me think new ideas for my own research; it "recharged" me and motivated me to continue doing my own research, which is supplementary to the work of the author Iris Xie. It made me acknowledge the contribution of the author and recognize that in fulfilling the ambition of developing a framework for understanding user-oriented interactive IR—a framework that provides recommendations for design and evaluation of interactive IR systems (including users' system usage and interactivity with reference to performance and usability)—we all have to contribute. We will achieve this goal, together, step by step.

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**Paper to Digital: Documents in the Information Age**. Edited by Ziming Liu. Westport, CT: Libraries Unlimited, 2008. 176 pp. $50.00. (ISBN: 978-15915-8620-3).

The chapters in this book are mostly updated versions of papers previously published by the author and his research team. The book provides a useful synthesis of some surveys and literature reviews that address some of the questions that concern librarians dealing with digital resources. One main theme of the book is the reexamination of some of the enthusiastic but unfounded claims of the digital enthusiasts—that the use of paper would diminish, for example. The chapters are organized around aspects of the scholarly communication cycle—creation, generation, dissemination, use, and preservation.

Chapter 2 discusses some of the historical trends in documents and their features, noting how greater information density means that devices (computers in various forms) are required to read them, and, therefore, preservation has become more, not less, problematic with the rate of technological change accelerating. Conversely, the ease of duplication has increased, as has the connectivity of documents through hyperlinking. What one regards as important trends is a personal choice. This chapter works as an introduction to trends in documents and documentation with a focus on the published text, but the author skips over (quite understandably, perhaps) much of the debate about the meaning of document. Therefore, there is less focus on the implications of convergence of information (in all types of media format) and communication technologies, and although the idea of uniqueness is mentioned, the problems of originality and intellectual property are not emphasized.

Chapter 3 examines some of the trends in scholarly communication—the increases in production and the growth in authorship and collaboration—, and presents an overview of the demand for older material, published at least 15 years ago. The article on which this chapter was based was published in 2003, which probably accounts for the omission of recent developments in open access publishing. Similarly, the next chapter, on trust in the preservation of digital information, reads, at times, rather strangely to me because perhaps some of the mechanisms by which individuals create trust in digital documents have now had time to become more familiar to the users. People are more accustomed to looking at digital facsimiles of original documents, and should be able to check their origin. More important, perhaps, trust in the preservation of digital documents requires an understanding of what is good enough for the user when dealing with a digital document. And that, in turn, requires knowledge of how knowledge production and use are changing with digital libraries and the availability of information on the Web—the Google effect. There is certainly something to be discussed about trust and credibility of digital information, but this as well requires a theoretical framework derived from social theory (e.g., chapters in Bishop et al., 2003) or a philosophical perspective on trust (O'Neill, 2002). A useful article (Kelton, Fleischmann, & Wallace, 2008) came out too late for this chapter, unfortunately. Perhaps trust in digital information—and the lack of trust in institutions and professionals—need to be seen in wider societal terms. The perceived need for accountability produces reams of information from institutions, but the lack of trust may be due to the lack of proper dialogue. If we

can ask questions from the information provided (metaphorically and practically), then there is a chance trust can develop. That, for me, is a more useful working principle for information producers than excessive worry about the readability or the authority or the quality (as defined by a librarian) of the text. Chapter 7, "Perceptions of the Credibility of Scholarly Information on the Web," again deals with a related attribute: credibility. Because this chapter is based on the findings of survey work among students, the discussion is more focused and certainly resonates with longitudinal survey work of UK students that were asked, among other things, their reasons for choosing particular electronic information sources (Urquhart et al., 2003), and this is one of the reasons why I find the chapter to be credible: It resonates with personal knowledge and beliefs! The list of features and circumstances that affect students' willingness to accept scholarly information on the Web (p. 96) provides some useful guidelines for those designing managed learning environments (course management systems). Priorities should be to relate the resources to the immediate needs of the students, and the verifiability works alongside the need to develop critical thinking. By presenting students with a few related authoritative resources on the same topic, and the occasional less reliable resource provided as a contrast, students should learn to compare, contrast, and critique.

Chapter 5, on reading behavior in the digital environment, has been written around a survey of self-reported changes in people's reading behavior over the past decade. The meat of the methods is contained in a footnote at the end of the chapter; however, the chapter itself focuses on the findings and the discussion of those findings in relation to the literature. More recent discussions of the use of e-books were not included, but more of the research studies on the use of e-books would be useful in expanding the discussion around annotation and use of the text. In addition, the design and use of tools, such as Zotero (mainly for and by historians), tells us more about the use of digital documents and their features. Many faculty are concerned about student plagiarism, and this chapter gives some indications of one root of the problem: clicking to another site, and scanning and collecting, rather than sustained reading. I was a little surprised that no discussion of the costs of printing to the students was mentioned. One theme from a UK study was the ways the students used to avoid paying print costs imposed by the universities (Urquhart et al., 2004). Sometimes the methods used to save documents or parts of documents, cheaply so as to avoid print costs, led to inadvertent plagiarism. As the author acknowledges, the chapter is based on the behavior of US students, and comparison with the UK situation indicates that measures taken by academic library services (to maintain income from services such as printing) may shape student information management behavior in ways unintended. Perhaps future studies of reading behavior in the digital environment need to be alert to the secondary and unintentional effects of some factors in the environment. A good example is the differences in cell (mobile) phone usage among countries—the use of "beeping" to send a signal message to a receiver free of cost and the variations in use of text messaging, influenced by call rate structures. My suspicions are that future reading behavior in the digital environment is likely to be affected by combinations of factors and interactions that are hard to predict at present. Research on digital editing and humanities computing gives some indications of the evolution underway in disciplines traditionally considered to be bound to the print text (Deegan & Sutherland, 2009).

Chapter 6, "Gender Differences in the Online Reading Environment," is based around a survey in a major Chinese University, with discussion of some other literature surveys. It puts forward hypotheses that require further exploration and testing, particularly as so many surveys, including the Chinese survey, are based on self-reported behavior (although the cited studies by Large, Behesti, & Rahman, 2002, are based on observation). This is an area of research fraught with problems of bias, for example, are the females (or the males) more likely to report one type of behavior as that is the behavior they think they ought to be exhibiting according to their perceptions of their gender stereotype? Certainly Table 6.4 (p. 74) has some anomalies: The values for changes in both in-depth and concentrated reading are similar between the genders, but the differences seem to emerge only when asked questions about reading selectively or sustained attention. Is reading selectively viewed as a good thing to do by the men but not by the women? There are some interesting questions and ideas raised in this chapter, but far more work needs to be done to synthesize the research on gender and reading, and the context is important as well. Until we know just what the males are looking for and reading and whether this is quite different from the material viewed by the females, we cannot, as the author stresses, make generalizations. One minor drawback in the organization of the book (for me) is the difficulty of finding out more about the methods used in the surveys. Anyone interested in replicating a survey would need to consult the source material, and then obtain and review the content of the survey questions. There are some suggestions given at the end of most of the chapters that are based around surveys done by the author, for future research directions, but it would have been a bonus to have had a list of some questions for postgraduate students to address in theses or dissertations, as set out in the survey instrument.

Chapter 8, on cultural differences in credibility assessment, might be a heaven-sent opportunity for some postgraduate studies in different countries and cultures, and there is a lot more information about the questions used and the comparisons given in this chapter. Careful comparisons of the similarities and differences should give us a better understanding of the assessment of credibility, and this needs to be done for different disciplines as well as ways of thinking and practice differ (Urquhart & Rowley, 2007). This affects not only the type of materials used by different disciplines, but also the attitudes of faculty towards those materials and, in turn, the role modeling they practice (often unconsciously) for students in the assessment and use of materials.

I approached Chapter 9, "Print Versus Electronic Resources: User Perceptions, Preferences and Use," with some trepidation. The question of print or electronic haunts those in charge of purchasing resources, for good reason, but the reader does not divide up the world of information searching in quite that way. Thankfully, the survey work was more concerned with preference elicitation and the type of trade-offs made, and the literature review continued this theme. This is, in fact, far more useful to library managers than simple questions on preference for paper or electronic. Tables 9.6 and 9.7 on the perceived barriers of digital and traditional libraries and circumstances affecting the use of digital and traditional libraries provide a useful checklist for library managers, who may be able to assess how their student mix, and recent developments in library services, map to the preferences listed.

I had the same mixed feelings about the title of Chapter 10, on the future of paper in the digital age. A sensible question for the paper producers, of course, and for conservation of the environment, but I am less sure about the debate, framed in this way, for librarians and libraries. As I write this review, I am sitting at a computer in Spain with an attached printer that consumes expensive print cartridges so quickly that I have changed my method of working to use far less paper. I never thought I would manage without printing out e-mails as a reminder of things to do, but, amazingly, the new system is now working for me, with a few hiccups on the way. In the chapter, the question, thankfully, is less about one or the other, print or electronic, but how the new technology complements the old technology, and how the new and old technology may become appropriated for particular purposes. Probably the term appropriation is a better description of the way technologies, old and new, are taken on and adapted for particular uses.

When pondering the question of whether this book works as a collection, as opposed to a collection that one could amass of the original papers, plus a do-it-yourself literature review to update, I was faced with a comparison between a paper document collection and the electronic collection. Although the literature collection has been updated, I think the updated literature has been added and worked into the existing text, rather than making major changes to the structure or argument. A book often works better as a way of understanding an author, and this book certainly helps to understand the vantage point of the author. It is much easier to understand the author's interest in cultural differences, and the questions the author asks of the often-unstated assumption that new is better among resources, and that new technology is inherently superior to old. The book would be useful for postgraduate teaching, in seminars

where students might debate some of the concerns of practicing librarians, and query some of the common assumptions about digitization.

What was missing? Sometimes I thought the hypotheses might be spelt out more clearly, and the gaps more clearly defined. Probably this is laziness on my part, but one of the distinct benefits of this book is that some chapters come with good ideas for postgraduate students to develop and test, but that definition could be clearer in a few of the chapters.

I also wondered whether some further development of ideas would require techniques and frameworks more commonly found in the information systems and social informatics literature. I could have missed this, but I found little reference to the literature on acceptance of technology, and some of those frameworks, or even the proposed unified framework (Venkatesh et al., 2003), might help illuminate the barriers towards use (or not) of electronic documents when, as the author stresses, the use and method of access to the content cannot be separated easily. The unified model, for example, proposes factors, many of which are discussed in this book—performance expectancy, effort expectancy, social influence, facilitating conditions, and these moderated (in whole or part) by gender, age, experience and voluntariness of use. Future work might benefit from a theoretical framework that drew on some of the research in information systems and some of the social sciences and uses of technology. The author has access to more data to comment critically on such frameworks than many of the social science researchers working in the field, and I would strongly recommend that this be the next stage in the development of the research.

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**From Papyrus to Hypertext: Towards the Universal Digital Library**. by Christian Vandendorpe. Translated by Phyllis Aronoff and Howard Scott. Urbana: University of Illinois Press, 2009. pp. 186. $65.00 (ISBN: 978-0252034350).

This is a fascinating book that is not well served by its title. To elucidate: This book was originally published in French as *Du papyrus à l'Hypertexte. Essai sur les mutations du texte et de la lecture.* However, in this new English translation, the subtitle has been changed to *Towards the Universal Digital Library* rather than using the literal translation of *An Essay on Changes in Text and Reading*. To dwell on this at the beginning of a review might seem unnecessarily pedantic if it were not for the possibility that this title change seems likely to have a profound effect on the book's readership, both intended and actual. It is possible that readers of *JASIST* may be interested by the title of Vandendorpe's work, perhaps expecting a discussion of digital libraries; however, this book has almost nothing to do with them beyond a brief mention of mass digitization projects in the last chapter. It is not, therefore, the right book for those looking to read about digital library protocols, development, or technical aspects. Yet, it is a fascinating book for readers interested in its actual subject—that of textuality and reading practices, and how these have changed as a result of various technological advances. This curious change of title is significant and regrettable since it would be a great pity if it results in this valuable book missing its intended audience only to confuse or disappoint readers looking for material on digital libraries.

Having established what the book is not, we move on to a discussion of what the reader interested in electronic textuality should expect to find. This book is written very much in the tradition of humanities scholarship rather than that of information science. As Bates (1996) observed, humanities scholars do not usually create their own data. Rather, their work consists of finding patterns in data that already exist and creating novel syntheses of previously unconnected facets of their research topic. In this, Vandendorpe excels. The book covers a huge range of research areas, from the history and sociology of books and texts to cognitive psychology; from post structuralist and semiotic theory to human–computer interaction; and from electronic textual theory to usability studies—and this is by no means an exhaustive list. Experts in any one of such disciplines may not find very much that is genuinely unknown to them; however, the value of this book is in its range of reference and its ability to combine information from so many different areas to produce a thoughtful and original discussion of texts and reading practices. For example, Vandendorpe combines discussion of the history of papyrus production and early printing with experiments in cognition and eye tracking in his consideration of why it is that we prefer reading columns of a certain width—a fact that was already recognized in ancient Greece. His analysis moves from the history of reading ancient scrolls to the production of the codex in manuscript and print, and back to the virtual scrolling of a computer screen. In so doing, he provides his readers with a new, thoughtful perspective on reading. The complexity of the issue, once set in historical perspective, also helps explain why the act of reading on screen still presents such problems for the producers and users of e-reading devices.

The book consists of numerous short chapters, which are in many ways reminiscent of blog entries since they are relatively short and focused on a single issue or problem. There also is no sense of an absolute narrative or necessary reading order. This in itself is the result of an experiment in the form of book production and reading since Vandendorpe originally wrote the text on an early hypertext writing tool developed for this purpose. As he admits in the introduction, this means that the printed book lacks some of the original facility for users to make associative links, or for the writer to suggest them, using hyperlinking. The codex may allow pages to be flicked through, but still requires a more linear reading style. As a result, the book has a structure that is not strictly linear but proceeds, with various digressions and literary excursions from the main plot line, from considerations of oral cultures through the advent of writing, and with it the invention of scrolls

and codices, to the age of manuscript distribution, printing, and finally hypertext and electronic publication.

It is not surprising, therefore, that such concerns as the different reading experiences brought about by hypertext as opposed to the codex are central to the book. Such issues were relatively new and challenging in literary studies in the late 1990s when the original French version of the book was published. Although this translation also is, in effect, a new edition of the book, it might be expected that the text might have a rather dated feel. However, this is not the case. This is partly due to the numerous updates and changes made to the text of the new edition, but it also may be because some of the best work on the theory and phenomenology of electronic text was done in the mid- to late-1990s, when such things as hypertext, the Internet, and e-books were being considered for the first time and before the Web had made them so ubiquitous as to be almost disregarded as objects of textual study. Although technology has moved on in the last 10 years, the theories behind the consideration of such textuality remain as relevant now as ever, perhaps because we now have a tendency to regard electronic textuality with less wonder and so are less likely to give it the attention of such writers as Bolter (1991), Landow (1994), Nunberg (1996), and Vandendorpe himself. Thus, to read a book first written in the first area of electronic textuality is refreshing and challenging at the same time, reminding us of how our relationship with texts and the act of reading itself has changed fundamentally in the intervening period.

Vandendorpe's consideration of the history of textual technology and reproduction provides an essential context for issues that we may assume to be essentially contemporary. For example, in the age of Facebook, there is a certain level of anxiety about the way that Web delivery of information, pervasive social networking, and mobile phone use may be affecting our brains and the ability of children to concentrate and process information (Wintour, 2009). However, Vandendorpe reminds us that the advent of writing itself brought with it fundamental changes to the way that we encounter and process information. His investigation begins with a consideration of how the cultures of writing and orality differ, and makes it clear that it was as writing itself developed that significant changes in the way we process information began, millennia before the invention of the Web. Readers, he argues, have more control over a text than do listeners: They can decide at what pace to read, when and where to do so, when they stop and start, which parts to choose, and what to ignore. Reading also allows information to be processed much more quickly since the eye can take in text much more rapidly than the ear can process sound. This, he stresses, was the real beginning of the information revolution, and it was at this point that the relationship between humans, information, and cognition began to change. And inevitably there were critics, notably Socrates, who alleged dumbing down and the death of scholarship as the result of the coming of writing. Vandendorpe continues to track the changes wrought by the coming of print and the way that the page has changed physically to facilitate reading, such as running heads, chapter numbers, tables of contents, and even punctuation and white space. He tracks the move towards intensive reading, whereby readers began to assemble different pieces of information from many sources, which might be skimmed or used selectively rather than the intensive reading of one canonical text that they were expected to study and know intimately. This, he argues, became prevalent in the 18th century, and although he does not labor the point, it requires little imagination to make links between modern concerns about the superficial use of multiple Web resources by today's students and the changes that mass publication of cheaper books brought about during the Age of Enlightenment. In fact, he provides no commentary on the implications of this movement towards eclectic idea-gathering, merely putting the facts before his audience and allowing them to draw their own conclusions from it.

This is one of the great strengths of this book. It is neither a hype-driven utopian vehicle for the praise of electronic information technologies nor is it a lament for some past golden age of reading. If anything, Vandendorpe's thesis appears to be that there was no such golden age but that at every time of major technological change, some commentators have nevertheless lamented its passing. Though he is a literary scholar, Vandendorpe remains immune to such temptation. He argues that all textual technologies take a considerable amount of time to adapt to fit their purpose. This process has taken hundreds of years for the codex, and he remains confident that the electronic text also will come to maturity, given time. This remains an optimistic vision, but never a blinkered or jingoistic one. This is very much to be welcomed since it avoids the lazy assumption that there must be an opposition between a conservative faction of book readers, who prefer their information on paper and are thus essentially backward-looking, and the new generation of techies, who espouse electronic text whatever its faults and at whatever price. Vandendorpe's beautifully balanced consideration of these issues makes it clear that no such opposition need exist, and that he is at once an admirer and enthusiastic user of new textual technology who also has a deep knowledge of and appreciation for printed texts.

*From Papyrus to Hypertext* therefore has a many valuable things to say about its real subject without the need to invoke spurious links to digital libraries. Rather than being disappointed not to read about them, it is to be hoped that readers will be fascinated by a thoughtful, scholarly consideration of the text, and how it and the reading process have been changed by mutations of technologies throughout their history.

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