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Section I: The IR System

In his 2004 revision of *Introduction to Modern Information Retrieval* Chowdhury was able to write "…the sole objective of any information storage and retrieval system is to transfer information from the source (the database) to the user" (p.192). In the last decade, however, the objective of many information retrieval systems has become more specific: to ensure that the sites' *users* become *consumers* of the marketed products. The preeminent commercial information retrieval system today is Amazon.com, the largest online retailer in the world. Nearly one third of Amazon's 15 billion dollar volume in 2007 was generated by its original department, Amazon Books (Rosenthal, 2008).

Amazon began business in 1994. When Amazon showed its first profit in 2004, founder Jeff Besoz said, "You can become a bigger part of a customer's life by just simply doing a better job for them. It's a very, very simple-minded approach" (Frey & Cook, An alien life form section, ¶8, 2004). From its inception Amazon Books has focused technology on the user interface. The site uses algorithmically derived relevance rankings based on common purchasing patterns and user preferences to retrieve specific requests efficiently, and to assist customers in moving from browsing to purchase (Delitt & Boston, 2007). Its dense pages offer multiple searching options: a subject menu on the side of the screen, a drop-down below the search window which offers suggestions and corrections, an "Advanced Search" option, and multiple forms of recommendation. Using the "Search Inside the Book" feature, customers are also able to view excerpts of many titles. Each Amazon Book page offers access to all these features, in addition to a plethora of ads.

As discussed in Dr. Edna Reid's Lecture 11 (2008a), information retrieval system designers must be sensitive to the needs and potential difficulties of those who may use the system, and designers should be proactive in creating systems which mitigate these challenges and meet these needs, especially for a retail business. Usernomics does not exaggerate when claiming, "The importance of good User Interface Design can be the difference between product acceptance and rejection in the marketplace. If end-users feel it is not easy to learn, not easy to use, or too cumbersome, an otherwise excellent product could fail" (2008, Efficacy of User Interface Design section, ¶ 4). Scholarly researchers may be motivated enough to tolerate the idiosyncrasies of an academic database; shoppers who find a user interface frustrating can just drive to the nearest store. Amazon's user centered interface design succeeds because it reflects modern theory and research into information seeking behavior.

Carol Kuhlthau's research, as summarized in Dr. Reid's Lecture 12 (2008b) emphasizes the importance of the affective domain in user searches. Users in the early stage of a search are uncertain and anxious, seeking support and direction. As numerous examples below will show, Amazon Books provides a reassuring multiplicity of access, direction, and suggestion. Human computer interaction can be viewed as a communication process (Reid, 2008c)—in this process the Amazon user interface strives to be seen as the user's personal friend.

The typical anxiety of the early-stage searcher may be intensified by some of the traditional assumptions and behaviors associated with book buying. Dr. Reid's Lecture 12 (2008b) discusses Dervin's "sense-making" model, which acknowledges that information seekers bring with them their own frames of reference and models for resolving difficulties based on past experience and cultural assumptions. Shopping for a book, usually an optional purchase, has many traditional cultural connotations connected to education, class, and affluence. For some, this activity may be intimidating and foreign; others may be seeking the reassurance of a familiar experience. Chowdhury (2004) discusses the importance of determining who the users of a particular information retrieval system will be, observing that " the general educational level, awareness of people in a society, etc, are also important determining factors influencing information seeking behavior" (p. 200). My evaluation shows that Amazon Books is predominantly successful in designing a user interface which meets the needs of both the literate, experienced book buyer, and the neophyte purchaser unfamiliar with bibliographic search.

As well as encouraging diverse anxious searchers, a user interface must support researchers at all stages of information seeking, as discussed by Dr. Reid (2008c), in her Lecture 13 summary of Marchionini's work. As the user of a system passes through various stages of the cognitive process, such as brainstorming, defining, and confirming, the user interface must guide the information seeker from the general to the specific. At early stages, the Amazon user interface makes great efforts to replicate the experience of browsing in a physical store, offering, in the form of lists and recommendations, opportunities analogous to the encouragement and advice available from experienced bookstore personnel.

The Amazon Books web site also recognizes the idea laid out by Marcia Bates as discussed in Dr. Reid's Lecture 12 (2008b), that information seekers may not search as system designers had earlier assumed. Rather than conducting a structured and sustained search, users seem to 'berry-pick' the best bits from varied sources. Before turning to a database search, they may in fact look for support from peers, or may mine for information within sources that they already have. This type of information seeking is highly supported by Amazon features such as "Frequently Bought Together", "Customers Who Bought This Also Bought", and especially, as will be discussed in more detail in Section II, by the social networking aspects of Amazon Books.

Section II: Evaluation of the Amazon Books User Interface

The table below displays a summary of my evaluation.

Table: Evaluation of the User Interface of Amazon Books

Principles	Descriptions	Point scale
1. Aesthetic and minimalist design	The Amazon home page is crowded and cheesy-looking. However, this online impression of a busy mall is suited to the varied users and diverse purposes of the site. The length of the top page can cause brief difficulty.	4= high
2. Consistency and standards	Amazon assures purchase through consistency: the top toolbar, linked thumbnail book covers, and subject list are available from any page. Site will suggest "Related Searches" for	4= high

Principles	Descriptions	Point scale
	problematic search vocabulary. Targeted marketing occasionally adds a step to searches.	
3. Documentation	For locating books, the Search window is so flexible and assistive that little documentation is required, but there is an "Advanced Search" link, always visible on the top toolbar, which provides limited searches in fields, and has Search tips listed.	4=high
4. Flexibility and efficiency of use	Search window provides instant access for the focused, experienced user; the busy Books homepage gives myriad options for the neophyte browser seeking direction. "One Click" shopping completes an order from the initial display page, bypassing 'checkout'.	5 = perfect
5. Help	Always visible "Help" assists mostly with shopping concerns. For search help, the window offers a drop-down of suggestions as terms are entered—this gives both spelling guidance and reveals preferred terms.	5=perfect
6. Help users to recognize, diagnose, & recover from errors	An unsuccessful search produces a clear "Your search does not match any products", but no suggestions—dead end. The UI offers spelling and search suggestions throughout the process, however. Besides the back button, links to different areas of the website are always visible.	4= high
7. Match between system and the real world	The Books area is analogous to a brick and mortar store, with common subject areas for browsers, familiar retail features such as The NY Times Best Seller List. Labels are succinct but text-reliant; site favors the print-learner.	4= high
8. Recognition rather than recall	All options are displayed on each page. Departments and Subjects are always listed on the left side. The "Advanced Search" page displays the "Search Tips" next to the search fields. Virtually no recall required.	5= perfect
9. User control and freedom	User can move freely from page to page with no 'undo' required. Keyword Search window and subject/ department links always visible. Users cannot eliminate the bombardment of advertising.	4= high
10. Visibility of the status of the system	Incredibly fast--2 Seconds average.	5 = perfect

Social Networking

Both Bates and Kuhlthau acknowledge the importance of peer interaction and support: social interaction in information seeking lowers affective filter concerns; it supports alternative, 'berry-picking' strategies as described by Bates (Reid, 2008b). It also provides information in varied, familiar forms, which fit within the individual's frame of reference as discussed by Dervin (Reid, 2008b). Though often called impersonal, Scott Lipsky, a former Amazon executive said, "Amazon was probably the first truly worldwide community that was built online" (Frey & Cook, The dark ages of e-commerce section, ¶8, 2004). Amazon Books offers chances to post reviews, to engage in discussion with other readers, to join online communities focused on a particular genre or author. Readers can also tag books or authors, which offers another search help for users. Lipsky feels that Amazon Books' community of users is one reason why Amazon continues to gain on their competition (2004, Frey & Cook, The dark ages of e-commerce section, ¶8, 2004).

Section III: Analysis and Conclusion

Because Amazon has such a varied clientele, I searched as different imaginary users, deciding before I began what the user's goal would be. I tried to design searches which would not be outlandish, but might be problematic.

In James Hobart's "Principles of good GUI Design" (2004), display of too many features on the top screen is listed as a negative; in this he is in accord with Neilsen's principle of Aesthetic and Minimalist design (n.d.). It is also Hobart, however, who reminds designers of user interfaces not to design for themselves, but for their users' needs and knowledge, and this principle applies to Amazon's user interface. The top page is bright blue and orange, and covered with ads, links, and information. It is cluttered and garish, but lively. Some research supports the impression that shoppers actually prefer an environment which is slightly crowded and visually dense (McQuitty, Shanahan, and Pratt, 2000). Marketing to a diverse group of shoppers, Amazon attempts to bring a little of the cheerful public shopping experience into the home.

As I searched the interface in my various personae, I found Amazon Books to be highly consistent. When I typed in 'physicans', as Dr. Reid did on Google, 272 thousand matches were found. Amazon also suggested the 'related search' for 'doctor' which gave me almost 500 thousand matches. Clicking on 'doctor' also brings 'related searches': 'medicine' and 'nurse'. The 'related search' gives controlled vocabulary without emphasizing control, which, as Hobart (2004) so rightly reminds us, nobody likes. No matter how far I wandered in these related search modes, I always had the same control bar and subjects lists, and could follow a different path at any time, without worrying about retracing via the back button. I could also consistently reach further bibliographic and purchasing information about a book by clicking on its thumbnail.

I found the Search window to be so supportive that little documentation was required, but there is an "Advanced Search' option available. It doesn't offer the kind of error support that the Search window has, but does allow users to search for combinations of attributes, such as binding or condition. There are limited foreign language search options, and a good list of search tips, such as "Too many keywords can constrain your search" (2008b, Search Tips section, ¶ 2) .

Amazon Books is extremely flexible and efficient. The site remembers and records search and browsing history for at least several days, so material can be quickly revisited. There are

accelerators on Amazon Books, but they facilitate purchase, rather than search—the 1-Click option allows a customer to purchase a book directly from the product page, skipping the checkout process (2008a) . Again, the keyword, relevance ranked search provides the flexibility, tailoring itself to the knowledge level and search methods of the user. For instance, as a hypothetical high school student in search of a popular book, I only had to enter "Vam" before the dropdown suggested 'vampire', which I clicked directly to *Twilight* at the top of the search list. As my academic user alter-ego, I could enter either War and Peace Garnett or War and Peace Volokhonsky, to be taken directly to my desired translation.

Help and error recovery are the keystone of the Amazon experience. As the academic linguist I searched for "Children's books written in Arabic", and received a pop-up "Search Tip", recommending that I use fewer words. The amount of support for error correction was amazing. As a high school student searching for material mentioned by teachers, I tried to retrieve books by Czeslaw Milosz. Typing 'Chezlaw Milosh' got me just "Your search didn't match any products. However, if I got the 'Cz' correct, or typed in only 'Milo', the name appeared in the drop-down. I browsed for books on "Captain Cook's ship". 161 books were returned, sorted on the side into subject categories, such as "transportation" or "philosophy". Since the site searches interior text as well as traditional field, the search is exhaustive rather than specific (Chowdhury, 2004), so that toward the bottom of the list I had *The African American Book of Values*, because it contained the text "found the ship's captain and cook asleep on the deck". By that point, however, I had far more useful listings than I could use. Irrelevant hits do not inconvenience the searcher on Amazon Books.

Matching a real book store, with subject sections, best seller display, etc, Amazon Books was easy for me to navigate, but not all users have wide experience in book stores. Hobart (2004) reminds designers to be concise in labeling, and Amazon's labels are succinct, but Amazon is a text-based site.—only the book cover thumbnails and the little sled on the checkout provide visual alternatives.

For Neilsen's criteria 9 and 10 I found Amazon to be excellent. Navigation is always easy; the toolbar is always at the top of a page with all options available. I do feel assaulted by the ever-changing ads, and would like to be able to screen or remove them. Of course, I am actually able to do this because, like many Amazon users, I automatically screen out the many portions of the page which are not relevant to my purpose.

I compared Amazon Books to Powells.com. Although Powells.com is, like Amazon, listed in the top 50 online outlets (Internet Retailer, 2008), it is also linked to a physical "City of Books" in Portland, Oregon, and sells used books as well as new. Since I did not investigate Amazon's affiliate used booksellers in detail, I investigated only searches for new books on Powell's. On opening the Powell's website, it is immediately clear that a different aesthetic rules, and a more specific clientele is courted. The top page has much more modern graphics than Amazon has. The muted grey-blues and browns are more sophisticated and less garish. There are the changing ads, but the books featured are not the mega-sellers prominently placed on Amazon. Powell's features promising, unusual work, not algorithmically targeted at me, but chosen by the staff as worthy of attention.

Amazon's user interface works hard to lose the intimidating cultural baggage of the bookstore. An examination of Powell's user interface reveals that what is sometimes a design error can also be an intentional marketing device—the Powell's user interface seems designed to make users feel that they are part of an exclusive, elite group. Read their comment in the Holiday Catalog section: "And since Powell's prides itself on our cut-above-the-rest clientele, why not follow their lead?" (Top 50 Books for Friday, December 5 section, ¶ 1, 2008). On the one hand, Amazon is more democratic. On the other, as an educated book purchaser, Powell's user interface is targeted to my taste and seems more trustworthy. I would never buy a book on a recommendation from Amazon, but just did from Powell's.

Besides appearance and marketing, the level of help available is the big difference between the two sites. Powell's offers good search help, including both a "How to Browse" link, and a downloadable set of search plug-ins which looked very intimidating (2008). When users are less expert, however, Powell's abandons them. As an imaginary high school student who has been listening to class lectures on archetypes, I typed in 'Karl Yung'. On Amazon a message popped up: "Did you mean Carl Jung?" It also listed a book by a Karl Yung. On Powells' I just got the book by Karl Yung. On Amazon my aurally educated student alter-ego typed in W.B. Yates. Amazon took me to Yeats without even asking what I meant. For W.B. Yates, Powells took me to one listing for a foreign language version of Yeats' work where his name had been misspelled on the page title. Powell's seems to feel that if you don't know how to spell it, maybe you shouldn't have it.

Aware of the importance of an easy, positive, and supportive online experience, the technological resources of Amazon have focused with tremendous success on the user interface. So successful has the relevance ranked search developed by both Google and Amazon become, that large libraries such as Australia's national system (Dellit & Boston, 2007) increasingly turn to the retail world for the newest search technology and innovation. Amazon Books has its problems however, in both graphic design and interface content. First, in its efforts to be appealing to all, it goes too far toward the lowest common design denominator for many users' taste—I don't want to look at a Kung Fu Panda DVD ad on every screen while browsing. Next, pages are too long. The main book page was 8 frames—sometimes it was difficult to relocate things I had already seen. Some of the material on the top page could be relocated to links or removed entirely.

 In the content on the interface there are more serious problems. Though admittedly a competitor, Powell's raises concerns about Amazon's online recommendations, writing: "Unlike most online booksellers, Powells.com does not sell promotional placement of books or merchandise" (Powell's Books Celebrates a Decade of Innovation in Online Bookselling section, ¶ 7, 2004). Even when Amazon recommendations are done in good faith, they can look absurd. Based on some gift purchases, Amazon frequently informs me of my desire for the latest Captain Underpants book. I would rather receive the general recommendations chosen by an acute individual than the algorithmically derived shopping hints currently available on the first level of Amazon. There are many other kinds of recommendations on Amazon Books, of course, but these too have been controversial. A 2004 *New York Times* story reported that many of the anonymous positive reviews on Amazon were written by the authors themselves or their family and friends; anonymous reviews are still posted on Amazon (Harmon). This practice does not inspire confidence, and user confidence in the interface system is crucial.

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