THE POSSIBILITIES OF CREATING AN INTERFACE DESIGN FOR HUMANISTS

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Contents

1. INTRODUCTION

Automated information systems have assisted information seeking behaviors by providing strong physical mechanisms and improved conceptual mechanisms. These two types of mechanisms are used by users to improve information retrieval. Information retrieval is achieved with these mechanisms by negotiating users' search behaviors throughout the system. Infomation retrieval is necessary to develop both physical mechanisms and conceptual mechanisms because support for only one type might cause difficulty for end-user in using computerized system.

The computer has been used in bibliographic information retrieval for more than twenty years. This area of information retrieval and its searching capabilities have become increasingly complex and sophisticated, and user interface design has also developed gradually. The first generation of user interfaces were not interactive, and until recently, interface designers catered to only the needs of expert users

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because costs and other factors limited users to a few trained professionals. Traditionally, online searching was the task of librarians, or information specialists. Online searching required technical skills, and end users needed intermediaries. However, today users have been changed from information professionals to everybody. The increased power of the computing environment in the workstaitions has forced the development of sophisticated interface software which incorporates searching expertise. In this way access to imformation can become easy for the novice as well as the expert.

In the 1960s MARC was introduced to the library world;in the 1970s automated cataloging systems were developed;and in the 1980s came the introduction of online public access catalogs. As each decade passed, the electronic environment in library has changed. Sophisticated new systems were produced and implemented to automate library functions and to provide end users with more efficient and effective services. Today, automated systems are used extensively in many different information environments and online catalogs have found acceptance by the public, replacing the more traditional card catalog.[1] One of the many things that OPAC do is that they make it possible to access to a broader range of information. These days, users can access multiple workstatios (e.g. CD-ROM, various gateways) through OPACs.[2]

In the early 80's, Markey found that users liked online catalog because searching the OPAC is fun, saves time, provides new services (e.g. providing information about circulation), and the OPAC provides new features like keyword searching and search limiting.[3] Users can

1) Beheshti, Jamshid (1992), "Browsing through Public Access Catalogs," *Informaion Technology and Libraries,* v.11, n.3. p.220-28

2) Aken, Robert a. (1988), -Meeting the Patron at the OPAC Crossroads: The Reference Librarian as an Online Consultant." *RQ*, v.28, n.1. p. 42-5.

3) Markey, Karen. (1983), "Thus Spake the OPAC User. "*Information*

improve information retrieval through OPAC use. However, it is not enough to improve information retrieval, the system needs to be user friendly, or it will fail in its function. In this context, the design of user interfaces is a very important factor in helping users enhance their information retrieval, and use search mechanisms fully.

In designing an improved interface, it is necessary to focus on end users since the proliferation of OPAC are based on allowance of end-users' searching.

In the early 1980's the online retrieval situation began to change, and industry leaders spoke of the new age of end-users. Industry leaders predicted a vast expansion of online retrieval markets, enormous growth in the number of people accessing systems, and simple access to information from every home. Development of the microcomputer has been a basis of these changes, and has caused the build-up of intelligent front end software packages. Lately, there has been a proliferation of such packages.[4]

To make system more user-friendly, and user-oriented, user studies have become an important factor in interface design. However, it is important to narrw down the user studies because one of the end-users' chief characteristics is their variety. Their research purposes, interests, experiences, preferences, characteristics are so various. The purpose of front end or interface design is to support various users with various characteristics of access to information retrieval systems with various level of skill. the purpose of this paper is to examine characteristics of humanists, and thing about possibilities for improving interface design for humanists, and to encourage researchers and interface designers to consider the needs of humanists as end users.

Technology and Libraries, v.2, n.4. p.381-7.

4) Hawkins, Donald T. etc. (1985), "Front End Software for Online Database Searching." *Online*, v.9, n.6. p.30-9.

Users come from all academic disciplines, but use is related to discipline.[5] Markey noted that one group which might be expected to express an unfavorable attitude toward the online catalog was humanities faculty.[6] Humanists have, until recently, been reluctant to use advantages of technology and these opportunities presented by emerging technologies. A mixture of indifference, skepticism, and in some cases, borderline hostility towards computers results in humanists with a psychological block and philosophical reservations.[7] This paper is to be a foundation for improving these hostile responses to online searching through improved interface design, and encouraging humanists to use technological benefits in libraries.

2. CHARACTERISTICS OF HUMANISTS

The boundaries of the humanities are very ambiguous because of interdisciplinary characteristics. In particular, history may be regarded as a social science and it has been suggested that some humanists would like to be regarded as social scientists. So historians may not fit the following characteristics of humanists, and music and art scholars may not fit following characteristics because of their different information needs like audio, or visual materials. However, religion, philosophy, art, music, literature, linguistics, theology and history seem to be commonly included in humanities. It is hard to make categories for humanists' characteristics since individual humanities

5) Whitlauch, Jo Bell. (1983), "Library Use Pattern Among Full-time and Part-time Faculty and Students." *College and Research Libraries*, v.44, n.2, p.146.

6) Markey , Karen. (1984), *Subject Searching in Library Catalogs:Before and After th Introduction of Online Catalogs.* Dublin, Ohil:OCLC Online Computers Library Center, Inc., p.2.

7) Walker, Geraldene. (1990), Searching the Humanities:Subject Overlap and Search Vocabulary. *Database*, v.13, n.5. p.37-46.

have idiosyncracies. Therefore, the following characteristics may not be fit every humanist. However, the follwing characteristics from broad categories, which may help interface designers to understand humanists. This paper presents what is known about interface design for humanists, and to examine further research which could be done with narrowing down the subject area.

Isolation

The most notable characteristic of humanists is that they work alone. Humanistic knowledge results from "the application of one mind investigating a slice of reality and interpreting it a new in the context of that individual's total experience and understanding."[8] The role of the individuals' subjective awareness on a factual framework causes the personal and individualistic nature of humanities research.[9]The personal and individualistic nature of research results in the isolation of scholars. It creates their unwillingness not to delegate literature searching or to ask for help.[10] Another reason why a humanist may be reluctant to delegate searching is that information searching is an important task in itself.[11] The individualistic and personal nature of humanists' research relies on browsing and searching.[12] Through browsing, they find things on one's subject, or importantly related to it, also on related-terms lists without asking for help.

8) Reagor, Simone and W.S. Brown. (1978), "The Applocation of Advanced Technology to Scholarly Communication in the Humanities." *Computers and the Humanities*, v.12. p.237-46.

9) Stone, Sue. (1982), "Humanities scholars:Information Needs and Uses." *Journal of Documentation*, v.38, n.4. p.292-313.

10) Wiberley, Stephen E. (1991), "Habits of Humanists:scholarly Behavior and New Information Technologies." *Library Hi Tech*, v. 9, n.1. p. 17-21.

11) Stone. op. cit.

12) Walker. op. cit.

Respect for influential peers

For most humanists, conferences have an important role in informal learning of what their peers are thinking and how these scholars evaluated the work of others in the field. Also most humanists want to get the approval of their peers for their writings.[13] The primary publications of humanists are monographs rather than journal articles. In the sciences, paradigms are strong. There is general agreement about the fundamentals of what is known. In the humanities, on the other hand, there are variety in research according to each researcher's knowledge and experiences. To understand a portion of a publication, humanists usually must grasp the context in which it apperars and how the entire work differs from previous treatments.[14]

To support humanists, librarians should provide bibliographic access for old and rare items, for instance, so that the scholar at least knows of their existence, even if they are not available on the spot.[15] Also, there is another need to see an original document or work of art in the humanities. Their most fundamental work depends on the availability of original works.[16] Cullars study showed that humanists often cited the books which were published in 1800's.[17] Having retrospective coverage may be more important to the humanist than having access to current materials. Because works published decade ago might still be definitive works for scholarship in the humanities, the scholar cannot rely on recent material alone, as it may or may not incorporate or build on a previous body of knowledge.[18] It is also

13) Wiberley, op. cit.

14) Cullars, John. (1989), "Citation Characteristics of French and German Literary Monographs." *Library Ouarterly,* v.59, n.4. p.305-25.

15) Stone. op. cit.

16) Weintraub, Karl J. "The Humanistic Scholar and the Library". *Libary ouarterly*, v.50, n.1. p.22-39.

17) Cullars. op. cit.

important to track down materials like different editions, successive drafts, gallary proofs, or page proofs.

Humanists' apparent preference for mongraphs rather than articles is supported by Heinzkill's citation analysis. Even though their overall study limited to literary journals, journal citations by humanists show low use of journal articles.[19]

Concentration on research specializations

Siegfried, Bates and Wilde showed through their experimental study that single bibliographic databases overwhelmingly predominated in scholars' selections. It is therefore necessary to provide bibliographies and detailed subject indexes of literary giants. Their study also showed that no one used full text or other nonbibliographic databases.[20]

Characteristics of vocabulary

As many studies show, the vocabulary employed by humanists is often ambiguous. Their vocabulary is "softer" than that of other disciplines, and semantic variations on a concept can make online retrieval nearly impossible.[21] The individualistic nature of humanities' research caused difficulties in vocabularies. The interdisciplinary nature also caused ambiguousity in their vocabulary.[22] Scholars were found to make heavy use of proper nouns in subject searching.

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18) Stone. op. cit.

19) Weintraub. op. cit.

20) Siegfried, Susan, Marcia J. Bates, and Deborah N. Wilde. (1993), "A profile of Ene-User Searching Behavior by Humanities Scholars: The Getty Onlie Searching Project Report No. 2". *Journal of the American Society for Information Science,* v.44, n.5, 273-91

21) Stern, Peter. (1988), "Online in the Humanities: Problems and Possibilities". *The Journal of Academic Librarianship,* v. 14, n.3. p.161-4.

22) Siegfried, Bates, and Wilde. op. cit.

Scholars did few author searches, that is, searches or works by authors rather than about authors.[23] Wiberley analyzed the levels of precision of categories of terms in humanities. He found the most precise terms were singular proper nouns. This is the name of a unique entity, either of a person or a single creative work. Second most precise terms were proper terms used as a collective therms that designate group membership. Least precise terms were general proper terms including collective, cultural, geographical, ideological, and institutional terms.[24]

3. POSSIBILITIES FOR OPAC DESIGN

Matthews and miller(1983) defined the interface in OPACs as follows:

> Interface features are those that involve the "user interface", the interaction between the user and the online catalog system. The salient characteristic of interface features is that they are generally created in a layer of software that lies between the user at the terminal and the actual search and retrieval mechanism in of the catalog.[25]

This definition is a very representative one. Many other researchers made other definitions which include psychological aspects. Traditional definitions of user interface call for interacting designs. Nowadays definitions include both noninteractive and interactive designs. Interfaces are now often referred to as gateways or front ends. They are either software or hardware that strive to make

23) Weintraub. op. cit.

24) Wiberley Stephen E. (1983), "Subject Access in the Humanities and the Precision of the Humanist's Vocaublary". Library ouarterly, b. 53, n.4, p.420-33.

25) Matthews, J.R. et. al. (1983), Using Online Catalogs:Anationwide survey. New York:Neal-Schman. p. 413.

information systems more effective and usable. They are user-friendly transparency aids, which make online systems and databases interactively and non-interactively support easy use.[26] The system can be considered with four aspects to support users : user friendly, intermediary, front-end, and gateway. The userfriendly aspect is simply indicates that it is easy to use and which usually implies easy to learn ; it in some way simplifies use and generally substitutes or reduces the need for a user's manual or online consultation of documentation. The intermediary aspect refers to a system which substitutes for the intermediary searcher. The front-end aspect indicates that the system is used in front of, or between, the user and a target search service or target database. The gateway aspect refers to the ability of one system to provide a pass through to another system.[27] Intelligent systems will reduce the gap between end-user and information systems, and will probably accelerate the new role of the interface as an intermediary between systems and users. This will change the role of information specialists or librarians from intermediaries to advisors or consultants.[28] The goal of front ends was to produce "a prototypical system that provides a user-friendly interface to a wide variety of users while eliminating the need for expert intercession.[29]

26) Neufeld, Lynne and Martha Cornog. (1986), "Database History:From Dinosaurs to Compact Discs". *Journal of the american Society for Information Science,* v.37, n.4. p.183-90.

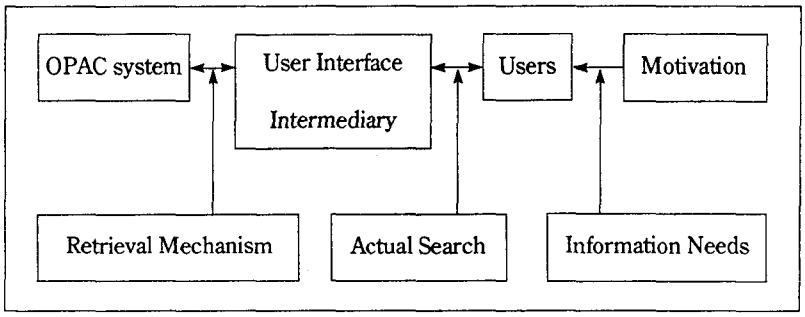
27) Williams, Martha E. (1986), "Transparent Information Systems Through Gateways, Front Ends, Intermediaries, and Interfaces". *Journal of the American Society for Informatio Science, v.37, n. 4, p. 204-14.*

28) *Fox Christopher. (1986), "Future Generatio Information Systems" Journal of the American Society for Information Science, v.37, n.4, p. 215-9.*

29) *Bitwas, Gautan, etc. (1987), "Knowledge-Assisted Document Retriueval I:The Natural Language Interface." Journal of the American Society*

The current trend is to design increasingly intelligent systems to improve performance and usability for a variety of users' needs skill levels, and to make systems sufficiently powerful and flexible while maintaining their usability.[30] However, it is not an easy job since usability is not a single, one-dimensional property of a user interface. Usability has multiple components. Usability attributes can be summarized as learnability, efficiency, memorability, flexibility, and subjective satisfaction.[31] The system should be easy to learn, easy to remember, effective to use, have a low error rate, and be pleasant to use so that the user, whether he is a expert or a novice user, will have valuable result with minmum but pleasant effort. It should also allow them reduce their useless effort in later searches.

In this paper, user interface is defined as software that on OPAC system as a usable system which "lies between the users at the terminal and the actual search and the retrieval mechanism". It should allow users to have low error rates, and be pleasant to use.(Figure 1)



(Figure 1)

for Information Science, v.38, n.2, p.83-96.

30) Henry, Helen k.(1991), "Human-Computer Interfaces and OPACs: Introductory Thoughts Related to INNOPAC."*Library Hi Tech*, v.9, n.2, p.63-8.

31) Nielsen, Jakob. (1993), *Usability Engineering*. San Diego:Academic Press. p. 26-37.

Thimbleby suggested six elements for good interface design:

1. A design should be task-specific. It would be good if users could know what they are getting with a system.
2. A design should have predictable performance. The system should have consistency in performance.
3. Design should be iterative. Iterative design is the term used for the approach to design where the first design is admittedly a prototype, and is used as a starting point for acquiring data and users' comments to improve the design.
4. Design has more control than evaluation. At the design stage, the designer can do practically anything, but once a system is built, it can be evaluated. Thus we cannot rely on iterative design to produce to a good system. Evaluation (and iterative design) are local optimization strategies. Design itself is a global optimization strategy.
5. A design should be simple. A system should be simple enough for a user to be able to perform useful experiments.
6. In summary, a good designer attends to detail in a detailed way.[32]

As Mooers stated, "an information retrieval system will tend not to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it."[33] Automation should make information retrieval easy and effective. Better interface design can make this possible. Keeping in mind these elements, this paper examins five possible areas for user interface design for humanists: search, browsing, search results, gateways into another information retrieval systems, and feedback.

32) Thimbleby, Harold. (1990), *User Interface Design*. New York: ACM Press. p.188.

33) Moors, Calvin. (1960), "Mooers' Law, or Why Some Information Systems are Used and Others Are Not." *American Documentatio*. v.11. p.ii.

Search

In search, three things can be considered, search fields, search options and search history. The Search field enters descriptors for author, title, key words, and subject. "Key words" include the words that are used in contents tables, abstracts, and indexes since humanists prefer monographs rather than journals. To meet the humanists' information needs, in addition to more traditional terms, "subject" also should include the following categories : works or publications as subject, individuals-all sorts of people, including authors, as well as fictional, mythical, or religious characters, and geographical names (noun form, Adjective form).[34]

Because of isolate characteristics, humanists are reluctant to ask to librarians, and they do not delegate their work. They might, however, listen to sound recordings by using the image of a tape recorder on the computer monitor, or ask questions from a "librarian" that is an animated image. By asking the animated librarian, they may be made to feel comfortable for the process is anonymous and nonjudgemental.

Graphical user interfaces, automatic spelling of the search terms, and the creation of automatic links among related subject headings and alternative terminology will help the users to use more advanced retrieval techniques. Also subject search should allow the user to negotiate the search term. If queries are too broad or too narrow, the following automatic performance will be helpful; (1) if two or more terms appear in the same subcategory, "OR" them together rather than "AND". (2) drop or add one of the terms based on knowledge logic, (3) replace a term by its parent or by subcategories.

Search options can be used to limit searches. The bibliographic form of the desired materials should be selected. Humanists prefer monograph rather than journal. They should be able to limit their

34) Wilde, and Siegfried. op. cit.

search to specific material formats. Usually humanists' interests are limited to specialized area so that they might want particular forms of materials. Also, humanists' most fundamental work depends on the availability of their original work. Search options should allow to limit by publication date or date range of desired materials. Humanists need access to old and rare items. So it is very useful to have interfaces assign dates in which the users are interested. Also it should allow users to track down different editions, successive drafts, and gallies.

It is desirable that as queries are stored or related searches are performed, the user establishes a hitory that is accessible through the search history field. If new searches are created and performed, it will be stored automatically in the account of each user. Old searches can then be viewed or revised and used for another search. Results of searches from old searches can be redisplayed via a query history feature. The search history provides access to the results of previous searches for possible revision, and a mechanism for combining the results of completed searches.

One more potential possibility is a concept of "infobot". As robots perform duties for people, infobots perform information seeking behavior for users. An animation of a librarian performs the information seeking behavior in accordance with the requests the user. It also allows the user to do several searches in accordance with the user's requests, while the user is free to do other searches.

Browsing

Browsing is an important and integral part of the information-seeking activities of library patrons, especially for humanists because of their ambiguous vocabularies and a "isolate" characteristics. Browsing usually consists of scanning lists of index terms, subject headings, shelflists, or brief bibliographic records. To improve the browsing function, graphical user interfaces have cognitive and psy-

chological advantages. The concept of simulating bookshelves on the screen helps users to be comfortable with machine, also it is easy to perform the search. Users may choose to "zoom in" on the specific item, and if interested, they would pick it from the shelf with mouse.[35]

Browsing is an important element since one of the characteristics of humanistic knowledge tends to be interdiciplinary. Browsing systems should allow users to move easily beyond boundaries of an area or subject, also, it should allow users leveless moving in hierarchical systems. For while Hierarchical systems are useful, they can cause confusion about where they are, and how they can be in the right place. The interface design should make seamless connections between subjects and between hierarchical levels. Subject listings should be narrow, because humanists are specialized in specific areas, and they should have related-term lists.

Search Resuts

The search results should provide basic bibliographic information, and allow users to examine abstracts and other short descriptions. Bibliographic information should include location of old, rare materials, information about different editions, information about successive drafts, and so forth. Also, results should sort by authors, title, and date. Users would want to be able to revise or refine the search, in addition to examining it in relation to the results. Search results also should be automatically stored in each user's account. If one relevant citation is found, the searcher should be able to connect to other items by that author, to that item's place in the title or series index for browsing, or to the subject index under any of that item's subject headings. Any items found provide a place for another "bridge" by author, title, series, or subject.[36]

35) Beheshti. op. cit.

36) Rice, James. (1986), "The Golden of Reference Service:Is It Really Over?" *Wilson Library Bulletin,* v.61, n.4. p.17-9.

Gateways into another information retrieval systems

It is useful to the OPAC support communication with other information retrieval systems since humanists work alone, and they are reluctant to ask. Also, since they believe that informal communication with peers is important, it might be useful to connect individuals who have common interests. ANLI (The Adaptive Network Library Interface) is a good example of that feature. ANLI may be the first system to explore the possibility of incorporating a communication channel between members of a common interest group in an existing online information system, and to study the patterns of adoption of it and users' response to it.[37]

Scholars in the huma-nities have interests which are specialized in narrow subject area, and OPAC should provide links between humanists and specialized databases. Frequently humanists have to make interlibrary loan requests. The OPAC should provide a function to file requests and log the resulting searches to users' accounts.[38]

Gateways to other systems can be assigned in a database selection part. As a user selects a gateway, it will lead users to lists of databases which are categorized by subjects. Steps should make communication with other systems simple, attractive, and transparent. For many humanists, the online catalog will be their first hands-on experience with telecommunications. They will not want to spend time studying documentation, and they will not want to learn new protocols when their screen lands them in a different library's catalog or when they travel to another library.

37) Zhao, Shuyuan and Kantor, aul B. (1993), "Development of an Adaptive Network Library Interface:Progress Report and System Design Issues." *Proceedings of the ASIS Annual Meeting,* v.30. p. 211-6.

38) Crawford, David. (1986), "Meeting Scholarly Information Needs in an Automated Environment:A Humanist's Perspective." *College & Research Libraries,* v,47, n.6. p.569-74

Feedback

If the user performs the search, the computer will ask whether he or she wants to receive bibliographic information of new materials about the topic he or she searched. If the user what to receive information about new materials, this information will be stored automatically to the user's account, and can be retrieved anytime and deleted as appropriate.

One of the characteristics of a usable system is the participation of users in its design. Users' evaluation should also be included in the system design. However, it is necessary to be concise in order not to bother the users. It is better to have two categories of satisfactory and unsatisfactory. If a user was not satisfied through the search, he or she can write the reasons and recommendations for better interface design, and improved retrieval support. This information should be collected, and used to the revise the system.

4. CONCLUSION

Today's technological advances enable us to design and implement systems that simulate libra-ries on computer monitors, simulate librarians on computer monitors, and allow the user to perform searches using improved information retrieval techniques without any knowledge of computers. As the user interface gets better, the computer becomes more transparent. Improved technological application to the library is the beginning of advancement, and will make OPAC more powerful. However, we still have many problems with these systems. We have to have more specialized databases, and have to invest more energy in creating more improved systems. Also, we can not ignore the financial problems. We may not deal with those systems right now. However, we can handle those possibilities in every OPAC in the near future.

BIBLIOGRAPHY

Aken, Robert a.(1988). "Meeting the Patron at the OPAC Crossroads: The Reference Librarian as an Online Consultant." *RQ*, v.28, n. 1. P.42-5

Beheshti, Jamshid. (1992). "Browsing through Public Access Catalogs." *Informaion Techonology and Libraries*, v.11, n.3.p. 220-28.

Bitwas, Gautan, etc. (1987). ""Knowledge-Assisted Document Retrieval I:The Natural Language Interface." *Journal of the American Society for Information Science*, v.38, n.2, p.83-96

Crawford, David. (1986). "Meeting Scholarly Information Needs in an Automated Environment:A Humanist's Perspective." *College & Research Libraries*, v,47, n.6. p.569-74

Cullars, John. (1989). "Citation Characteristics of French and German Literary Monographs." *Library Ouarterly,* v.59, n.4. p.305-25

Fox, Christopher. (1986). "Future Generation Information Systems". *Journal of the American Society for Information Science,* v.37, n.4, p.215-9

Hawkins, Donald T. etc. (1985). "Front End Software for Online Database Searching."*Online,* v.9, n.6. p.30-9

Henry, Helen K. (1991). "Human-Computer Interfaces and OPACs: Introductory Thoughts Related to INNOPAC." *Library Hi-Tech,* v,9, n.2. p.63-8

Markey, Karen. (1983). "Thus Spake the OPAC User." *Information Technology and Libraries,* v.2, n.4. p.381-7

Markey, Karen. (1894). *Subject Searching in Library Catalogs:Before and After the Introduction of Online Catalogs.* Dublin. Ohio: OCLC Online Computers Library Center, Inc., p.2.

Matthews, J.R. et. al. (1983). *Using Online Catalogs:A nationwide Survey.* New York:Neal-Schuman. p.413.

Moors, Calvin. (1960). "Mooers' Law, or Why Some Information Systems are Used and Others Are Not." *American Documentation*. v.11. p.ii.

Neufeld, Lynne and Martha Cornog. (1986). "Database History:From Dinosaurs to Compact Discs" *Journal of the american Society for Information Science,* v.37, n.4. p.183-90

Nielsen, Jakob. (1993). *Usability Engineering.* San Diego:Academic Press. p. 26-37.

Reagor, Simone and W.S.Brown. (1978). "The Application of Advanced Technology to Scholarly Communication in the Humanities." *Computers and the Humanities*, v.12, p.237-46

Rice, James. (1986). "The Golden Age of Reference Service:Is It Really Over?" *Wilson Library Bulletin,* v.61, n.4. p.17-9.

Siegfried, Susan, Marcia J. Bates, and Deborah N. Wilde. (1993). "A Profile of End-User Searching Behavior by Humanities Scholars:The Getty Online Searching Project Report No. 2". *Journal of the American Society for Information Science,* , v. 44, n. 5, 273-91.

Stern, Peter. (1988) "Online in the Humanities:Problems and Possibilities". *The Journal of Academic Librarianship,* v.14, n.3, p. 161-4.

Stone, Sue. (1982). "Humanities Scholars: Information Needs and Uses." *Journal of Documentation,* v.38, n.4. p.292-313.

Thimbleby, Harold. (1990). *User Interface Design.* New york:ACM Press. p.188.

Walker, Geraldene. (1990). Searching the Humanities: Subject Overlap and Search Vocabulary. *Database*, v.13, n.5. p.37-46.

Weintraub, Karl J. "The Humanistic Scholar and the Library". *Library Ouarterly*, v.50, n.1. p.22-39.

Whitlauch, Jo Bell. (1983). "Library Use Pattern Among

Full-time and Part-time Faculty and Students." *College and Research Libraries,* v. 44, n. 2, p.146.

Wiberley Stephen E. (1983). "Subject Access in the Humanities and the Precision of the Humanist's Vocaublary". *Library Quarterly*, v.53, n.4. p.420-33:

Wiberley, Stephen E.(1991). "Habits of Humanists : Scholarly Behavior and New Information Technologies" *Libranу Hi-Tech*, v. 9, n.1 p. 17-21.

Williams, Martha E. (1986). "Transparent Information Systems Through Gateways, Front Ends, Intermediaries, and Interfaces". *Journal of the American Society for Information Science,* v.37, n.4, p.204-14.

Zhao, Shuyuan and Kantor, Paul B. (1993). "Development of an Adaptive Network Library Interface:Progress Report and System Design Issues." *Proceedings of the ASIS Annual Meeting,* v.30. p.211-6.