

ACADEMIC-WATCHING:

library web usability and information seeking:

a case study at the University of Trieste

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SUMMARY

At the University of Trieste *academics* tend to make use of library resources without the *intermediation* of librarians. As a rule they bypass *reference* services and library *instruction* courses. On the other hand they advise students on how to seek and gather information for their papers and dissertations.

Our library *web site* is becoming more and more “stuffed” with resources and with instructions on how to use such resources. Is our site *usable* (easy to use, easy to learn, supportive) for our “*expert*” users?

Hence, the need to conduct a *task oriented formal usability test with think aloud protocol* on a small group of academics from different faculties. Further detailed evidence was collected through semi-structured interviews, semi-structured questionnaires and informal post-test debriefing and conversations.

While analyzing and interpreting the data, the *emerging theory* determined a *paradigm shift*, thus highlighting the need to pursue further investigations to gain deeper understanding of how to *target* our “expert” users and *profile* our services accordingly.

INTRODUCTION

Background

The High Business School of Trieste was established in 1877; James Joyce was one of the English lecturers between 1904 and 1920. The school was appointed the status of University by royal decree in 1924.

There are presently 12 faculties, ranging from Medicine to Arts, from Law to Engineering, 27,000 students, 2,000 professors and lecturers, 800 administrative and technical staff and 45 librarians (not including the administrative staff working in libraries).

The University Library System was first set up in 1995; it has great autonomy and is coordinated by a chief librarian. Its aim is to manage all the resources (budget and staff) more efficiently and to monitor quality standards by superintending Faculty and Department libraries. We have 5,000 e-journals on subscription and 80 indexes and databases. Our OPAC is a union catalogue of the main libraries of the region Friuli-Venezia Giulia and holds 500,000 bibliographic records. We are library system managers for the local hub of the National Library Service.

Research problem

According to Strauss & Corbin (1998, 38), a good research problem can stem from “personal and professional experience”. As head of the reference service I kept wondering why, according to our records, post graduates accounted for less than 5% and academics for less than 3%. Often students were baffled by the buttons in our homepage linking to:

- libraries
- catalogues
- services
- databases and indexes
- e-journals.

Were “novice” users disoriented because they lacked basic library skills and knowledge of the library system organization? Our library web site was redesigned a couple of years ago by a team made up of four librarians and one computer specialist. It was never tested with real users. The terminology, use of frames, layout of explanatory texts, classification of databases and indexes by discipline, access to e-journals and update of the site were not found entirely satisfactory by reference librarians within and without the team.

Nonetheless academics seem to need no intermediation. How do they cope?

Do they make use of our web site to carry out information-seeking processes, to what extent and with what results?

Aims

- *to analyze the approach of academics to information seeking*
- *to facilitate their searches*
- *to better target our services.*

Objectives

- *to test the site with “expert” users¹*
- *to highlight its major usability problems*
- *to start an evidence-based web redesign.*

¹ Here “expert” implies a scholarly knowledge of how information is indexed, stored and retrieved in a library.

LITERATURE REVIEW

Jakob Nielsen's famous *Alertboxes* provide invaluable practical information on how to conduct a *formal usability test*, why you need to test only with five users and how to avoid major mistakes in designing your web site. According to him, expert users "are just like anybody else ... They have neither the desire nor the time to learn the idiosyncrasies of individual websites" (Nielsen, 2001a).

Formal usability tests have been conducted in academic libraries by Battleson, Booth & Weintrop (2001), Clairmont, Dickstein & Mills (1998?) and Cockrell & Jayne (2002). Pace's report (2002) is entirely devoted to web usability.

Evidence-based web redesign is tackled by Ficht & Cervone (2001) and by Guenther (2000); Fuller & Hinegardner (2001) apply it in a medical library and Shucha in a law library (2003).

As for the *impact of digital libraries*, Bollen & Luce (2002) have studied usage patterns, Cherry & Duff (2002) have made a follow-up survey, Edelson & Gordin (1996) analyze "accessibility vs. availability", Jerabek, Meyer & Kordinak (2001) concentrate on library and computer anxiety, Ray & Day (1998) investigate student attitudes, Smith (2000) search features and Marchionini, Plaisant & Komlodi (1998) illustrate the Library of Congress National Digital Library Program, while Bonthron [et al.] (2003) examine the use of e-journals and Shaw (2001) the use of the Internet in English literature.

Criteria for assessing the *quality of academic libraries on the net* have been developed by Chao (2002) and by Choudhury [et al.] (2002), while Griffith, Hatley & Willson (2002) focus on user-system interaction.

On *disintermediation* Kyrillidou (2002, 42) warns us that "The driving force behind disintermediation is, in part, the need to make information dissemination more effective and efficient, and technology has facilitated this to a large extent". Fourie (1997) states that "In order to determine the possibilities for disintermediation, the process of information searching should be analysed". The interest of researchers has shifted correctly to "information-seeking towards the satisfaction of needs" (Wilson, 2000) because "... it is important to know how library users think and behave as they seek information, how they learn to use the library, and, more importantly, how they like to learn" (Massey-Burzio, 1998, 208). According to Ehrlich & Cash (1999, 166), "Close analysis of how people actually work and learn now ... offers a rich opportunity to generate new insights into the digital future...Decisions made about disintermediation need to be based on informed evidence, not mere expediency". *Social informatics* is developing "theories and findings that are pertinent to understanding the design, development, and operation of usable information systems..." by pursuing "contextual inquiry" and analyzing the "social context" (Kling, 1999).

According to Fourie (1997, 7), librarians ought to commit to “the improvement of information systems, user interfaces and the training of end-users”. Interfaces may take the form of scholar portals, as in Campbell (2002), or of information gateways, as in Clairmont, Dickstein & Mills (1998?).

The new role of academic Web sites as “surrogate librarian instructor” which have to fulfil “several overlapping roles that combine reference, research, informational and instructional services for a broad constituency” has been thoroughly examined by Cockrell & Jayne (2002, 122)

Focus groups to investigate user perceptions of library web pages have been held by Crowley [et al.] (2002) and by Massey-Burzio (1998, 208), who underlines the risks involved: “Many people, finding the Internet so much easier to use, bypass the library”.

On the other hand Hildreth (2001) has investigated the phenomenon of “*false positives*”, i.e. “users [that] express satisfaction with poor search results”.

As to the attitudes of *academics* towards library services, according to the Day [et al.] (1998) “Many of the services currently available to academic staff and students are not being used to their full potential...The quality of information available via electronic information sources deters many academics not only from using the sources of information themselves but also from recommending the services to their students”.

Often expert users “are not aware and / or are not convinced that the library is a complex, information environment that, in order to utilize it productively, requires knowledge and skill. Faculty admitted that they must not know everything ...They think they should already know how to use the library” (Massey-Burzio, 1998, *passim*).

The issue of technology versus user-friendliness is analyzed in the proceedings of a conference held in Milan in 1999 (Foglieni ed., 2000): see Lancaster (disintermediation), Solimine (user-friendliness), Bolzoni & Santoro (new forms of communication), Scolari (OPAC), Pettenati (user profiling), Pickard & Dixon (technostress), Prasse (usability testing), Tammaro (user empowerment).

As Fourie (1997, 7) puts it “Librarians need to monitor the so-called user friendliness of information systems as part of their core mission, i.e. “to make it possible for patrons to get information easily” and in Massey-Burzio’s words (1998, 215) “we need to focus on our core mission, namely, making it possible for people to *get* information easily”.

METHODOLOGY

“As social phenomena *are* different in kind from physical phenomena” (Wilson, 2000), multiple sources of evidence are needed. According to Strauss & Corbin (1998, 29), research is a “flow of work” and “each of the types of work (e.g. data collection, analysis, interpretation) entails choices and decisions concerning the usefulness of various alternative procedures, whether these are qualitative or quantitative”.

A case study approach seemed most appropriate as the aim was to “get under the skin” of our key informants, to absorb their culture and obtain detailed thick data in context by using different techniques.

No “random sampling” is needed in qualitative research (Strauss & Corbin, 1998, 281); academics were therefore recruited from different faculties among those who had never attended the reference desk (convenience sample).

Data collection

1. **Preliminary face-to-face semi-structured interviews** set the scenario and provided rich qualitative and subjective data. After a few preliminary closed questions, the interviewees were let free to talk at length about their feelings on technology, library services and their own approach to information seeking. The interviews were tape-recorded with the consent of the interviewees and subsequently transcribed.
2. Observation took the form of **task-oriented formal usability testing with the “think aloud”** protocol. Only five users were tested, according to Nielsen’s algorithm (Nielsen, 2000), and were video-taped. At the beginning of every individual session the meaning and purposes of the test (the usability of our web site was under question, not their performances) were duly explained. It was difficult to follow the pre-determined script and taking a non participant stance was hardly possible – especially for a reference librarian. Furthermore the verbalization of users took the form of a flow of consciousness often leading to outspoken doubts and actual questions; everything was accurately transcribed. Academics were much more cooperative and eager to know than expected. This procedure gave deep insight of what was on the mind of the user while seeking information.
3. **Post-search semi-structured questionnaires** gave both quantitative and qualitative data on how users perceived the difficulties in performing the tasks assigned and on how users judged the quality of the Web site itself. As Nielsen puts it (1998), “Watch what people

actually do. Do not believe what people say they do...users self-reported data is typically three steps removed from the truth”.

4. **Debriefing and informal conversation** over a cup of coffee afterwards gave deeper understanding of the habits and procedures of an academic trying to find information and on his appreciation of the library services.

Data analysis and interpretation

Field notes and memos helped not to lose the thread and sense of direction, though keeping an open mind proved even more essential to let the theory emerge from the evidence collected.

Rerunning videotapes and tapes, analyzing the transcripts and classifying the data, thus making sense of it, was a lengthy but rewarding business.

All the quotations from the interviews and the tests were translated from Italian into English trying to find a balance between “overtranslation” and “undertranslation” (Newmark, 1988, 24) and to convey the spontaneity of the original utterances.

FIELD WORK: FINDINGS**Interviews**

Let us introduce our key informants, all professors:

USERS	FACULTY	SUBJECT TAUGHT	HIGH SCHOOL	COMPUTER SKILLS
A	Law	Tax law	Scientific studies	Word-processing, Java, Java script, online indexes, web designer
B	Engineering	Design and methodology of industrial engineering	Technical studies	FORTTRAN, Mathcad, analyst programmer, Windows 2000 prof
C	Modern languages	Translation from English into Italian	Classical studies	Word-processing, Internet, "I don't understand how the PC works at all but I use it"
D	Medicine	Physiology	Scientific studies	Programming, Basic ("when I was young"), word-processing, Excel
E	Arts	Economic and social medieval history	Classical studies	"I am a monkey at the keyboard", "I use the PC to write", e-mail, Internet
AGE	IMPACT OF TECHNOLOGY		LIBRARY "AWARENESS"	
30	"Once upon a time even finding the judgement of a Court could be an Odyssey...now I just have to look it up in a jurisprudence database."		"I could perceive while attending University that libraries were changing... before automation and after automation."	
49	"A crazy escalation in quality."		"I mainly borrowed books during the first two years at University... when you say indexes do you mean journals?"	
47	"Technology helps but as soon as there is a delay I lose my temper, I know it is not sensible of me but I cannot help it."		"When I needed something in the library there was always someone I could turn to."	
51	"I no longer read on paper. I only use e-journals and do not even print out articles. I have a feeling that if something is not there [i.e. in e-journals] it is worthless."		"I did not attend libraries a lot as a student... then, at the beginning of my academic life, I had to deal with heaps of paper."	
50	"I now can check the OPAC from home... but please do not get rid of the card catalogue."		"I was involved in purchasing books for the library... I labelled them too... I am fond of paper."	

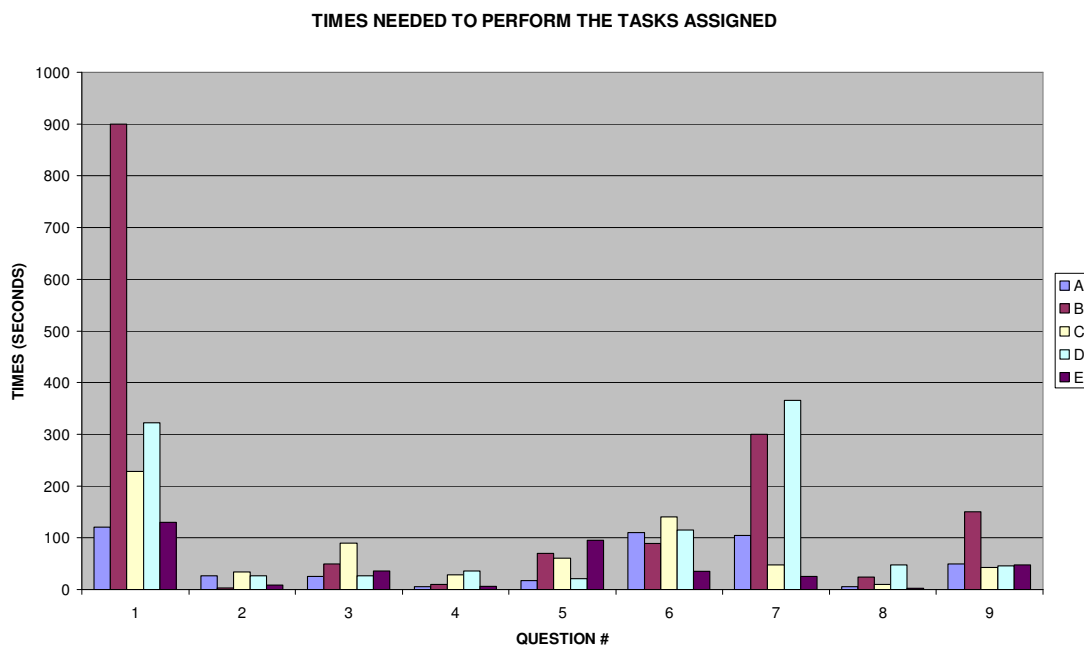
Observation (formal usability test)

Our informants were asked to use the site to accomplish the following tasks:

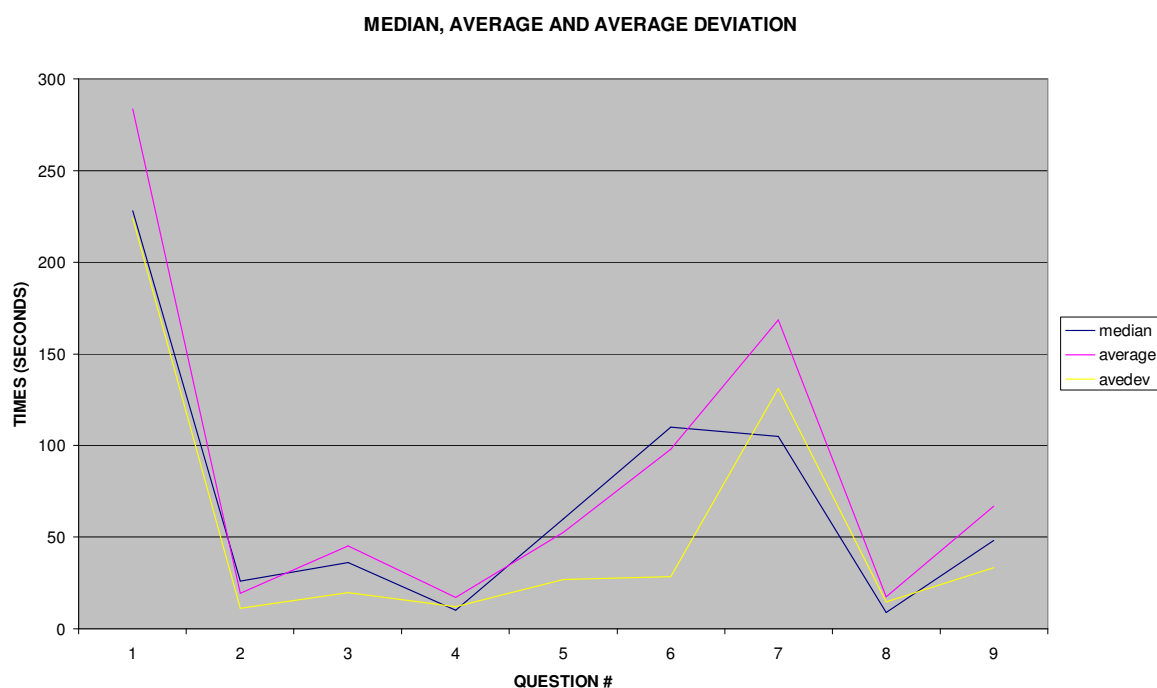
TASKS	QUESTIONS
a) Discovering factual information (e.g. a library opening hours or services)	#2, #4, #8
b) Finding an e-journal that belongs to the libraries' collections	#3, #5

c) Locating the most appropriate resource for finding bibliographic references on a specific topic	#6, #9
d) Verifying the existence of an article on the basis of a bibliographic citation	#1, #7

Here is a chart of the times needed by each user:



Here is a chart of the median, average and average deviation of the times needed:



Instead of scoring the answers correct or incorrect it was considered more significant to determine whether the task had been performed with or without support from the librarian (N. S. stands for NO SUPPORT, S. stands for SUPPORT):

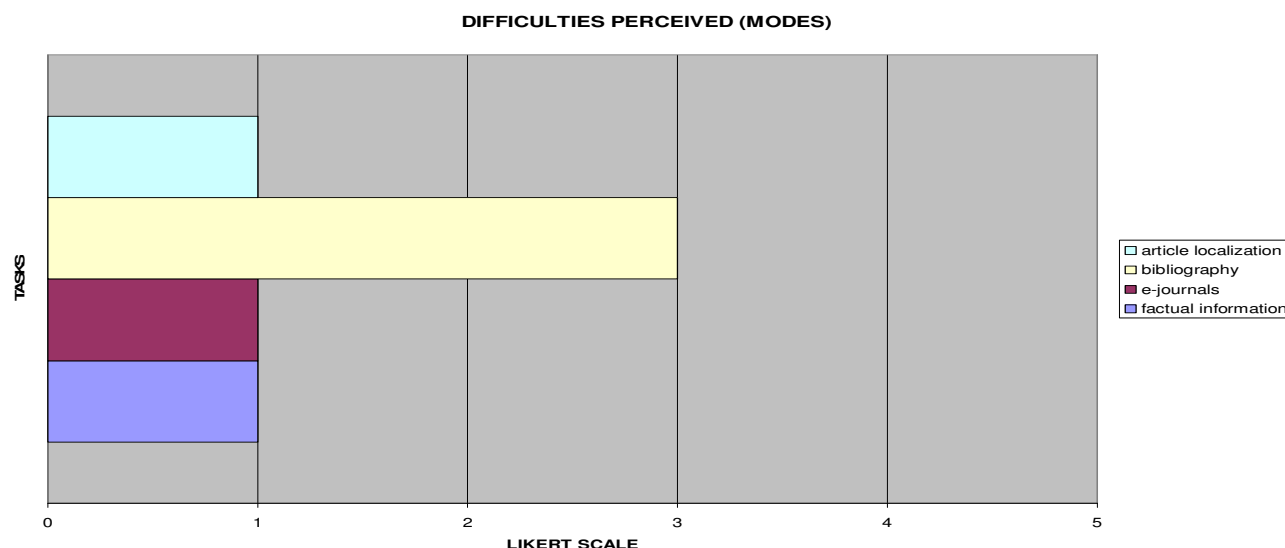
Users	I	II	III	IV	V	VI	VII	VIII	IX
A	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
B	S.	N. S.	N. S.	N. S.	N. S.	N. S.	S.	N. S.	S.
C	S.	N. S.	S.	N. S.	S.	S.	N. S.	N. S.	N. S.
D	S.	N. S.	N. S.	N. S.	N. S.	S.	S.	N. S.	N. S.
E	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.

All results point to minor difficulties or no difficulties in finding factual information and finding an e-journal that belongs to the libraries' collection (a and b type questions); on the contrary major difficulties were encountered in locating the most appropriate resource for finding bibliographic references on a specific topic and in verifying the existence of an article on the basis of a bibliographic citation (c and d type questions).

Users A and E (40% of the sample) managed to perform all tasks with no support.

Questionnaires

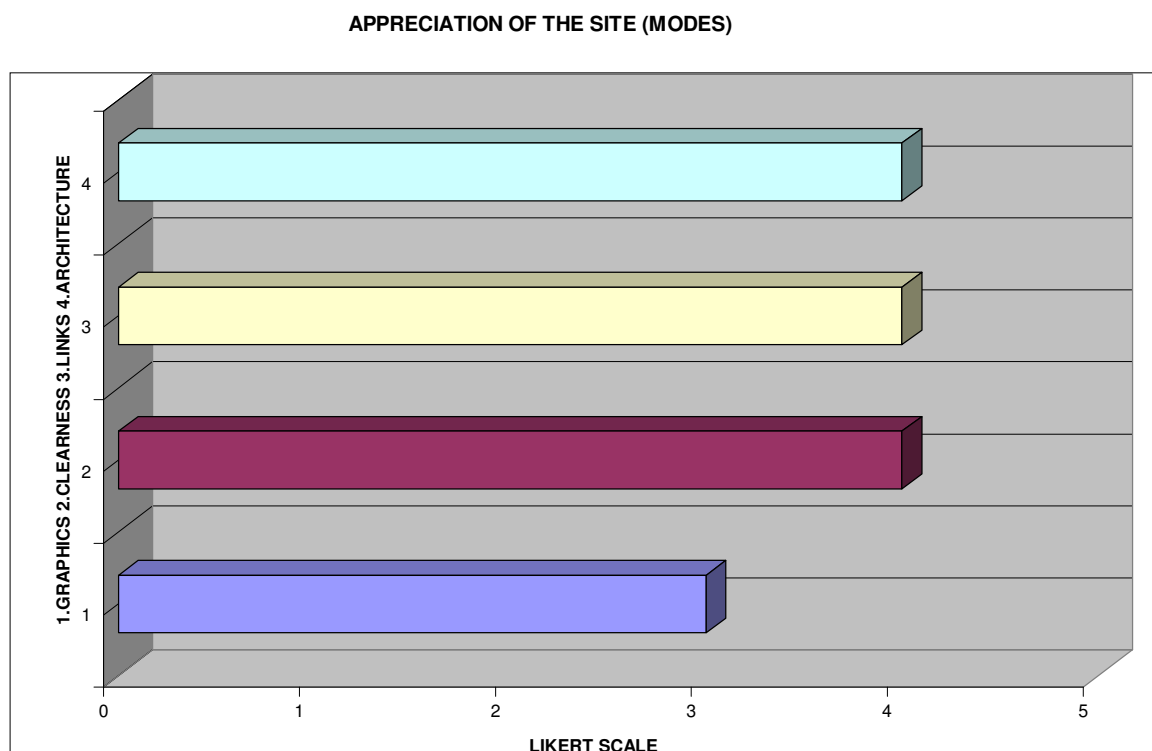
Our users were asked to rate the difficulty perceived in performing the tasks assigned on a five-point Likert scale (*not at all difficult; a little difficult, rather difficult, very difficult, very difficult indeed*). The following is a chart of the modes of the difficulties perceived for the tasks:



Finding bibliographic references was the only task rated “*rather difficult*” (mode). Locating articles was rated “*not at all difficult*” (mode). Comparing such results with the times and support needed to perform the tasks assigned, it can be said that our users tended to underrate the difficulties met.

They also tended to be generous when evaluating our site. Here are the most recurring values (modes) scored on a five-point Likert scale (*not at all, a little, quite, a lot, very much indeed*) related to:

1. GRAPHICS: are they pleasant, do they aid navigation?
2. CLEARNESS: is the terminology used comprehensible?
3. LINKS: if I click a button is it clear which resource I am accessing?
4. OVERALL SITE ARCHITECTURE: is the logic of the site clear?



Debriefing and informal conversations

Luckily enough, our informants found the interviews and test entertaining as well as intriguing. The climate was pleasing and relaxed. They showed interest in the project and asked to be kept informed about its outcomes. All of them lingered and conversed amiably after the test, thus supplying further data on their “real” routine work and habits.

FIELD WORK: DATA ANALYSIS AND INTERPRETATION**Interviews**

The academics belonged to different subject fields and that was done on purpose. They turned out to have very different experiences with library services:

“Nowadays books and paper articles are still of paramount importance because, unlike Anglo-Saxon countries, in Italy there are no extensive law digital libraries. Nonetheless, online databases and indexes have made the library become the place where one looks up also what is not physically owned by the library itself”.

“I use google a lot, I think it’s the best search engine. I use the Internet every day”.

“I find all I need in my department library”.

“I have subscribed to alert services and mailing lists, such as Biomednet, there is a user profile, you just have to say what you are interested in and they keep you updated, I am not able to do a bibliographic research all by myself, I just can’t do it”.

“I have not yet understood certain things my colleagues can do so well. They are always better informed than me on what has been recently published. Publishers send me brochures and I browse through them”.

Usability tests

The tasks assigned intentionally referred to library and information sciences, a subject unfamiliar to all of them so that the results could not be flawed by preconceived notions. This choice disoriented our users. A physician who knew when to use Medline could not think that there must be an equivalent for other subjects.

80% of them could not focus on the process and method of information seeking and kept referring to their own microcosms. They were all professional researchers but 60% of them had an idiosyncratic approach to bibliographic research, lacking flexibility and methodology, relevance and precision. They actually did not know how our web site was organized, and consequently could not select and exploit all the relevant resources offered by the library system.

40% tried to switch to google to find information even though they had been warned they could only use the resources within the library system web site.

A few hints on the information seeking behaviours of our users:

A	critical use of all indexes and databases; skills in using all the OPAC facilities; knowledge of search strategies
B	google for every need, does not know OPACs cannot be searched by web spiders
C	“I want to search only the catalogue of my library. I do not want to see the other libraries holdings”

D	only e-journals (even for articles dating back to the Seventies)
E	only paper (even though there are e-journals relevant to the subject taught)

Only user A (20% of the sample) was aware of the most appropriate strategies to carry out a bibliographic research. 60% used the same strategy for every information need. User E (20%) was hampered by the medium (paper vs. digital). 40% said “I’ve never done such a thing before” when confronted with a routine task such as localizing an article in the OPAC. 60% could not tell the difference between what would be found in the library catalogue as opposed to periodical indexes. 80% had difficulties in interpreting or accessing serials information, they behaved as “serial illiterates” (Cockrell & Jayne, 2002, 123).

User E (20%) thought that the current OPAC did not contain serials descriptions because in the past the monographs card catalogue was separated from the serials card catalogue. She managed to find the relevant information with no support by trying all possible OPACs.

Actually all this information is given in the site and our users said they liked our site “a lot” as for clearness, links and architecture. However 80% of our sample seemed not to read the instructions and preferred to proceed by trial and error.

This attitude is well-known in literature as the “paradox of the active user”: “users would *save* time in the long term by taking some initial time to optimize the system and learn more about it. But that’s not how people behave in the real world...” (Nielsen, 1998).

Contextual conditions

80% of our users had a vague notion of what the library system was and how it worked, relied on the department or faculty library only and had a “reliable person” there to turn to just in case. Unfortunately the Department staff do not belong to the library system; they are usually administrative staff who lack professional library skills. As a rule, the organization chart at the University of Trieste requires no specialized librarians in department libraries.

According to Strauss & Corbin (1998, 132), “*Contextual conditions* are the specific sets of conditions (patterns of conditions) that intersect dimensionally at this time and place to create the set of circumstances or problems to which persons respond through actions/interactions”.

In our case, the department staff cannot help academics make explicit their information needs, as usually happens during the interview before a reference session.

This is why the formal usability test turned into a sort of elite interview where interviewees somehow turned into interviewers. It was a forced situation which did not reproduce the way

academics behaved when seeking information in real life. The test was based on how students usually behave when seeking information after being instructed at the reference service.

The quantitative data gathered through the usability tests and questionnaires converged with the qualitative data gathered through the interviews, usability tests and informal conversations. The data collected on our users' seeking behaviours to satisfy their information needs determined a paradigm shift whereby the site usability became less and less of a priority.

The “invisible library”

The Library System of the University of Trieste is not yet visible and accredited within its parent organization notwithstanding its efforts to improve library services. In Italy there is no deep and pervasive culture of how to use libraries. The newly-published 158-page report on the state of innovation and digital technologies in Italy by the Department of for innovation and technologies² hardly mentions libraries and very superficially. Academics take it for granted that they know how to use libraries; some of them believe that no special skills are needed to use them. The initial hypothesis that academics did not attend the reference service because they found all they needed in our site was disproved by the findings. Their needs are latent; they are not able to express them because they are not aware of them. They are conscious of those needs only when they can discover and assess the benefits deriving from their satisfaction. It is true that academics are not required to have the same expertise as librarians. On the other hand academics act as supervisors and tutors when students have to write their theses and dissertations.

A similar situation was found at Washington State University: “Do difficulties in locating articles result from lack of knowledge of the concepts and processes involved in indexing and retrieving articles or because users are unable to find the resources they seek among the library’s Web pages?

The first instance might be addressed by providing targeted instructional materials, whereas the second might be corrected with improved Web design and simplified page layout”

(Cockrell & Jayne, 2002, 123).

Variation

“When a contradiction is found it is important to note whether the data represent a true inconsistency or whether they denote an extreme dimension or variation of the phenomenon in question. Discovering contradictions leads us to question our data further to determine what is really going on, whereas discovering variations extends the dimensional range of a category and gives it greater explanatory power (it accounts for differences).” (Strauss & Corbin, 1998, 135).

² <http://www.innovazione.gov.it/ita/index.shtml>

User A (20% of the sample) was perfectly aware of what was to be found in the OPAC, of how an index and a database worked, of truncations and Boolean operators; he sent interlibrary loan requests through the online form and he checked his loans via the OPAC. He was used to the traditional library and was expert in the digital library services as well. He was the youngest and the subject he taught was interdisciplinary. He was the only one to have a critical approach to library skills. He had changed three Universities and four faculties and he had been less than one year at Trieste: being used to “diversity” he had a flexible and open mind when seeking information. He was both a technophile and a “high user”.

CONCLUSION

This research was carried out with the consent of the library system management; it was the first initiative of this kind at the University of Trieste. It gained the interest and encouragement of our interviewees, who appreciated our attempt to improve library services on an evidence-based approach. It proved to be a fine opportunity to promote and make known our activities. An inadequacy in “public relations” and communication emerged.

The paradigm changed and the focus shifted from our web site and its usability to more complex phenomena. The usability test identified gross usability problems and namely:

- ✓ frames hinder navigation
- ✓ terminology is not always clear
- ✓ the general architecture of the site is not always comprehensible
- ✓ texts are not read.

Questionnaires contradicted what the test revealed; users did not perceive the test as difficult and perceived the web site as friendly notwithstanding the support and time needed to perform the tasks assigned.

Several purposes were served:

- test the web site with “*expert*” users
- analyze the *information seeking behaviours* of our “*key*” informants
- acquire knowledge on how academics “*feel*” about library services
- advertise and popularize our initiatives, *improve our external communication*.

This leaves out

- *to facilitate the searches of academics*
- *to better target our services*
- *to start an evidence-based web redesign*.

It seems clear that 80% of our users were not “high” users. They did not have a deep knowledge of our web site. Therefore an evidence-based web redesign is not the first step to take to facilitate their searches and to tailor our services to their needs.

The apparent friendliness of web interfaces makes the use of bibliographic instruments seem simpler. The digital environment is not by itself a barrier to usage. What does not change is the complexity of information that libraries have to convey and interfaces can help to a limited extent. As a matter of fact, those who made a better use of digital libraries were those who were best acquainted with traditional libraries (even though our E user was partially biased by a propensity to stick to tradition). The problem is that our libraries are hybrid, i.e. in a state of transition, and the

situation of our catalogues and retrospective conversion is chaotic – to say the least. Therefore special skills and competences are needed, together with a high critical spirit and flexibility.

Normal usability criteria (those used to evaluate commercial sites) do not fully apply to academic library system web sites. They represent an interesting but partial view of the problem. The contents to convey are too complex and the procedures to retrieve information are likewise complex. Remote users can surely benefit from enhanced web usability but in campus users need to exploit the library resources to their full potential.

Our context calls for enhanced communication. A great amount of work that goes on behind the scenes of a library system is still invisible to our users and stakeholders. Strategic and routine tactics are needed: the library system services ought to be popularized and marketed. Therefore courses, seminars and meetings – all kinds of face-to-face communication – must be given top priority and must become institutional activities in the Library System. Academics have to be involved to realize what their latent needs are and to be detached from their microcosms. This may also happen indirectly, while co-organizing library instruction classes for their students. Even the usability test turned out to have an unexpected didactic side.

As Kling (1999) puts it “Support resources (training/support/help)” are key elements to design a “human organizational “intelligence system””. They are necessary to go beyond mere “technological access” and to ensure “social access”, i.e. “the mix of professional ... and technical skills ... for using technologies in ways that enhance the professional practices and social life” (Kling, 2000). This may be the starting point for a follow-up study. Further research is needed to find the right way to turn the latent needs of the academic staff into explicit needs and to tailor refresher activities and tutorials to the specific requirements of scholars.

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