

# *The Roles of American and Polish Academic Library Web Sites: a Comparative Study*

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This article discusses the roles of academic library Web sites, summarises the findings of research aimed at comparing the contents and usability of Polish and American academic library Web sites and presents conclusions regarding the basic functions they perform. Twenty-five Polish and 25 American Web sites were evaluated according to a detailed questionnaire prepared specially for this purpose. In total, 275 different elements of academic library Web sites were evaluated and analysed, including 237 elements regarding their contents and 38 regarding their usability. It became evident that these groups of Web sites differ significantly as regards to the contents but their usability features are quite similar.

Generally speaking, as the research proved, Polish academic libraries treat their Web sites as “shop windows” and points of access to the information about their book collections (through OPACs). American academic libraries, on the other hand, tend to perform all their functions completely on the Web and have moved as many services and resources as they can to the new online and digital information environment. While the users of Polish Web sites are only informed about the services offered in “real life”, those who use American Web sites – “virtual versions of libraries” – can complete their tasks and satisfy many of their information needs wholly on the Web.

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## *General background and goal*

Among many changes in academic life that affect academic libraries' performance, at least a few are worth stressing here as very rich in consequences. Today universities “are moving from a model in which we package knowledge around the expertise of the faculty to a model based on the learning outcomes realised by students” (Smith 2000). This means that academic libraries also have to move from a “content view” to a “competency view” developing those services that help the students attain new skills. Furthermore, universities are moving from traditional, face-to-face, formal and regular education based on printed resources to a flexible process strongly depended on the Web and digital resources, which can be characterised by: flexible structure, flexible programs and a variety of forms. Such changes result in great

heterogeneity of the population of academic library clients (Kraśniewski 1999).

Academic libraries have to satisfy various and non-standard needs and provide very flexible services focused more on individualised and distant contact with their clients. To answer new demands they not only have to move their services and resources to the Web but also should consider the different cultural and educational backgrounds of their users and, for example, the needs of people with disabilities. The next change is connected with the commercialisation of education (quite a new phenomenon in Poland) and increasing stress on measuring and proving the quality and indispensability of universities. Academic libraries are supposed to contribute significantly to students' progress and learning outcomes as well as to scholars' achievements (Kozmiński 1999). Libraries have to prove their usefulness and that

the money invested in their resources and services are effectively transformed into the outcomes mentioned above (Troll 2001). It cannot be achieved without effective public relations and building a strong and positive image.

And last but not least, the system of scholarly communication is undergoing substantial changes. New ideas and concepts resulting mainly from the so-called "serials crisis" along with developments in technology have already affected and will continue to affect academic libraries in the near future. In particular, the variety of electronic formats of scholarly publications and digital sources forces libraries to maintain access not only to traditional journals or their electronic equivalents, but also to preprint servers, self-publishing Web sites, quality-controlled subject gateways or just Web sites of great scholarly value. Besides, it is often suggested that academic libraries should actively take part in scholarly publishing and support the new forms of scholarly communication (Alexander and Goodyear 2000).

Factors that are obviously extremely important today are the development of ICT and the emergence of new types of users – more or less experienced Web surfers, not only used to but also expecting virtual or semi-virtual services. For such users, if something does not exist on the Web it does not exist at all. These users come to universities and academic libraries (or rather to their Web sites) with habits formed on the Web and skills acquired using other Web services. For such students a library Web site becomes the only known face of the library –

a critical meeting ground between the information professional and the individual who is seeking information. (McMullen 2001, 7)

American libraries had to face such challenges a few years earlier and, of course, this process is still not completed. Today, because Polish academic libraries are more and more exposed to similar problems, it is worth comparing their performance on the Web with that of American academic libraries. The main goal of this article is to compare the contents and usability of Polish and American academic library Web sites to identify the roles they perform in the modern information environment. This, as the author hopes, could be a good starting point to improve and develop Polish academic library Web sites. Furthermore,

this comparison could be inspiring also for those responsible for academic library Web sites in other countries by providing a reference point for decision making and evaluating as well as offering a list of the range of features to be implemented.

### *Searching for criteria*

However, the first question that had to be answered was related to the criteria for evaluation and comparison. The author believes that only a large-scale comprehensive and detailed examination can be really useful for comparing Web sites and for improving Polish sites. Evaluation carried on at too general a level can lead to misinterpretations. In this research, general conclusions result from detailed findings.

There are many and various examples of checklists designed to evaluate Internet resources, but there are only a few regarding academic library Web sites. In fact, there are no commonly accepted standards or even sets of criteria for evaluating such Web sites (Chao 2002, 170).

There is not enough space in this paper to review all the previous papers concerned with the issues of the evaluation of library Web sites, but at least a few are worth mentioning to illustrate the problem. The need for designing such a questionnaire was expressed, for example, by Clausen (1999), but the very interesting and inspiring tool he constructed to evaluate Danish library Web sites was dominated by criteria regarding the form and usability of the Web sites. There were not enough criteria designed to evaluate the content, and some of them were formulated too ambiguously to fit in with this comparative study. Probably the most complex approach to searching measures for the evaluation of library Web sites was presented by Hungyune Chao (Chao 2002). He tried to identify the most important criteria and develop a diagnostic tool for experts. His efforts resulted in two (longer and shorter) very interesting questionnaires, but they also are not directly useful for the goal of this paper. The criteria were defined at a very general level – the lack of precision makes it difficult to match the same feature observed on different Web sites always with the same criterion and, what is more, to evaluate the same element from different Web sites in the same manner. This is also why another interesting research project on the content

of university library Web sites in English speaking countries (Still 2001) is not directly relevant to the goal of this paper.

However, all the papers mentioned above contributed somehow to the final version of the questionnaire (see the section, Research sources and methodology, and Appendices II and III). Other papers discussing similar issues are either dominated by imprecisely defined criteria regarding the form and usability or focused only on selected and specific problems of academic library Web sites (and will be used to analyse the possible roles of such Web sites later in this paper). To reduce the ambiguity to a minimal extent, a comprehensive checklist, detailed, precise and particularly relevant for evaluating academic library Web sites content and usability had to be constructed.

Because the planned research was to result in comparing the roles performed by Polish and American academic library Web sites, the author decided to base the questionnaire on the theoretical analyses of possible roles of such Web sites. First, all the various conceptions of modern academic library Web sites will be discussed and, from this base, their possible roles and the basic features indispensable to fulfilling these roles will be identified. They will form the foundations for the questionnaire used in this study.

### *Basic conceptions and possible roles of academic library Web sites*

Generally speaking, a few basic conceptions of academic library Web sites can be derived from the literature. Each of them results in some roles to be played by the Web sites.

#### *Bridge between the Internet and libraries*

The integration of these two information environments – the Internet and the library – is far from being completed, so the tendency to bridge those two information environments seems to be obvious. In other words, a Web site should make it feasible for the ‘Internauts’ to find information about printed library resources and the possibility of their use as well as about various forms of access to such resources: photocopying, photographing, printing and scanning, online ordering of copies from printed resources, online ordering

printed items from closed stacks or remote locations, and so on. What is more, there should be two-way traffic: the users of a given library should be able to use Internet services and resources through its Web site. Such an approach is well illustrated by some modern OPACs accessible on library Web sites. Users “coming from the Internet” can search and order printed books or journals and at the same time those “coming from the library” can navigate directly to remote Web resources and online databases catalogued by librarians (Burke, Germain and Ullen 2003, 291–2; Baruth 2000). It can be seen as a portal – “a hub from which users can locate all the Web content they commonly need” (Calhoun 2002, 142–3).

Academic library Web sites can enhance such possibilities by providing Internet searching tools, instruction on information retrieval on the Web, properly organised and catalogued (or even annotated) links to valuable and relevant resources or educating their users how to use information resources available in this environment efficiently and safely (Sharp 2000). Academic libraries can also use this bridge to “send” some of their printed resources to the Web environment, digitising them and placing on their Web sites – particularly those, which are of great value.

#### *Library shop window*

The analogy is obvious; similar to a typical shop window, an academic library Web site should present the most important library products and services, promote the latest acquisitions and special offers or provide information about the whole offer and encourage the users to enter the library. This conception includes the idea of one-way communication (from a library to its users) and confines significantly the role of a library Web site. It informs and promotes resources and services but its users have to come to the library building to make use of them. Research on the information function of academic library Web sites has been carried out both in the U.S. (Shemberg 2000) and in Poland (Głowacka 2000). The necessity of promoting academic library Web sites has been stressed by many authors (Sapa 2001; Guenther 1999; Carpenter 1998). Besides, it is often suggested that these Web sites should also be used to promote libraries and to create a positive image – professional, scientific, and user friendly (Kocó-

jowa 2004; Balas 1998, 46–49; Carpenter 1998, 62–66). The effectiveness of reaching a given library's target group was taken into consideration in searching for new measures for academic library quality conducted under the auspices of the Association of Research Libraries (Kobulnicky and Stoffle 1999). Furthermore, many visits to a library Web site and its popularity make it easier to find sponsors or convince stakeholders to support the library (Slagell 2000). Unfortunately, in spite of a general understanding of such issues, this function of academic library Web sites seems to be a little neglected in practice. Even though recommended by the American Library Association *Library Advocate's Handbook* (2004), using library Web sites to promote the library happens very seldom and only for narrowly defined tasks. Another field of activities that is implied by the concept of a shop window is public relations (Marshall 2001, 119, 121). One-way communication suggests preparing and disseminating materials designed for the media and supporting groups.

#### *Elements of the Web environment (of the mother university and the Internet)*

The tasks of an academic library Web site depend to a large extent on its Web environment at a given university. In a small, centralised institution, a library Web site can be the only such element. On the contrary, at a big university a library's site may be surrounded by the Web sites of branch libraries, archives, computing centres, publishers, departments, institutes and so on. Differences in its position will generate differences in its users' expectations. McClure and Lopata addressed such problems along with the aims, methods and techniques of assessing the academic networked environment as early as 1996. The role of the library Web site in this environment was also discussed by, for example, Arte (2001). This concept suggests the next tasks for academic library Web sites – they should organise effective access to all the resources offered by the mother university, and contribute to the integrity of this environment through the unification of names and headings as well as standardisation of graphics to ensure seamless communication within the environment. Furthermore, it suggests close connections between the content of academic library Web sites and educational processes and research being

carried out at the mother universities. Academic libraries, together with universities, university presses and scholarly societies are sometimes perceived not only as important parts of the old model of scholarly communication, but also as vital elements of an emerging new one. As organisations with established reputations in the academic community, they can offer reliable, trustworthy and recognised Web space for e-publishing to attract faculties to this form of publishing. In addition, the responsibility for preserving and archiving e-publications as well as making them accessible through the Web can be the domain of academic libraries, thus defining new tasks for their Web sites (Buck, Flagan and Coles 1999).

An academic library Web site could also be seen just as one of the billions of Web pages comprising the World Wide Web. Apart from educational functions connected with using information resources available on the Web and the problems connected with competitiveness mentioned earlier, attention should be drawn here to the fact that users' behaviours and expectations are in great part shaped by other Web services. It finds its expression in standard and unified rules of usability. Authors publishing on the issue of academic library Web sites' usability generally do not indicate any features specific for such Web sites, and use commonly known techniques and criteria to evaluate their usability (Battleson, Booth and Weintrop 2001).

#### *Virtual version of the library*

In fact, the conception of a virtual version of the library is the widest spread and in great part encompasses those points discussed before. Day by day, more and more students confine themselves to using academic library Web sites and they stop visiting library buildings (Obst 2004, 105). We should presume that such users expect and will expect libraries to satisfy their needs completely on the Web. It means that in more and more cases users of academic libraries will perform their functions only on the Web (McMullen 2001, 7). This approach induces a significant enlarging and enhancing of the roles of academic library Web sites as compared with the concept of a library shop window.

The Web sites not only should inform and encourage library users but also have to satisfy their

needs by providing access to relevant digital resources available online and offering information and library services on the Web, e.g., interlibrary loans (Coffta and Schoen 2000). In addition to links to external collections (i.e. digital libraries), academic libraries offer also more and more digitised resources from their own collections. However, access to electronic full texts in modern academic library Web sites primarily means access to e-journals (Rich and Rabine 1999). Academic library Web sites are also gateways to those digital online resources accessible on the Web that are not fully integrated with this environment. This refers specifically to the various bibliographic, abstract or citation databases offering restricted access to registered users. One can also easily find literature on virtual reference services or electronic reference services (Jacsó 2003; Kimmel and Heise 2003; Janes 2002; Stacy-Bates 2001; Janes, Carter and Memmott 1999) and even bibliographies compiled and accessible on the Web (Wasik 2001; Hadid and Reed 2000; Sloan 1998). As Janes proved in 2000, 45% of American academic libraries offered such services online (Janes 2000).

As mentioned in the first part of this paper, modern academic libraries are supposed to take an active part in education and support programs offered by their mother universities as well as assisting in developing information literacy, through instruction in the effective use of information (Tobin and Kesselman 1999). To achieve these goals, libraries should also ensure appropriate conditions and tools – not only in their buildings but also on their Web sites – for individual and group learning as well as for general exchange of ideas and thoughts. In contrast to the concept of a library shop window, here we should note these elements which involve two-way communication. An academic library Web site can be successfully used as a tool and space for contact with sponsors and donors providing not only information for them but also space for honouring their efforts and tools for sending money online. It seems to be particularly important in American libraries (Hazard 2003) where such processes and supporting groups are well organised (Friends of Libraries n.d.).

Summarising the above considerations, the following basic roles for academic library Web sites can be formulated:

1. Provider of online information about printed resources of the library and a tool for handling processes connected with accessing such resources.
2. Gateway to online resources not fully integrated with World Wide Web.
3. Access point to digital resources integrated with World Wide Web.
4. Provider of information and reference services online.
5. Tool for educating library and information users.
6. Space for communication with various groups of library users, supporters and collaborators as well as for e-publishing.
7. Tool for promoting the library (as well as its online services), creating its image and realising public relations tasks.
8. Keystone for a given university local Web environment.

### *Research sources and methodology*

The original questionnaire (designed to evaluate the content of the Web sites) was prepared on the basis of this theoretical analysis of possible roles of academic library Web sites presented above in brief, and previous evaluations of such Web sites by others, as cited earlier in this paper. At this stage of developing the questionnaire, the broad areas regarding the content were defined and many specific features and elements composing these areas were identified but some others still needed specification. What is more, its comprehensiveness was not ensured – some aspects and detailed elements could have been missed in the above considerations. This is why a pilot test was carried out. It was aimed not only at polishing up the first version of the questionnaire but also at making sure that neither a feature nor an element that could be found on Polish and American academic library Web sites was omitted. In other words, after the pilot, the questionnaire represented an ideal academic library Web site composed of all the possible features and elements (in examined groups of Web sites and at a given time).

As was previously mentioned, contrary to the content criteria, the rules of usability are rather standard and unified. This means that the questionnaire designed for the evaluation of academic library Web sites can (to some extent) be enriched with ideas and concepts derived from experiences and checklists regardless of the types of Web sites for which they were designed. The

process of developing this part of the questionnaire was similar to the one described above for formulating content criteria with one exception – the theoretical analysis of possible roles as a way of formulating the basis for the questionnaire was replaced by an existing set of criteria. Nielsen's (1995) well-known heuristics were chosen as a starting point. The usefulness of this method, based on these heuristics and known as "heuristic evaluation" for Web site usability evaluation, has been proved (Levi and Conrad 2001). However, to be used as criteria in a detailed questionnaire designed for a specific group of Web sites, they had to be significantly transformed.

First, the literature was studied to make them less vague and easier for interpretation, and then the pilot was carried out to ensure the relevancy and comprehensiveness of the modified criteria and to correct any problems that could appear in the process of Web site evaluation. Previously cited papers by Clausen, Chao or Still contributed only a little to the content criteria, but they helped significantly to formulate the criteria regarding usability. In addition, a long list of quality indicators ranked by experienced users (Wilkinson, Bennett and Oliver 1997) was used to find precise interpretations for the original heuristics. The top of this list is occupied by the criteria regarding Web sites clarity, communicativity, navigation tools, preventivity or flexibility (alternative versions for different groups of users). Another publication that appeared to be very useful was a paper on library terms evaluated in usability tests and other studies (Kupersmith 2003), which cast more light on the problem of communicativity.

Various aspects directly connected with the consistency and structure of Web sites, efficiency of accessing information, division and navigation are often discussed in publications on information architecture. One in particular contributed a lot to the final concept of usability criteria used in the research described in this paper – a book written by Louis Rosenfeld and Peter Morville, originally published in 1998, and then translated and published in Poland (Rosenfeld and Morville 2003). Furthermore, the first version of the questionnaire was strongly influenced by the experiences gathered through usability testing of American academic library Web sites (Dickstein and Mills 2000; Battleson, Booth and Weintrop 2001)

The pilot research was carried out in June and July 2002. The following four Web sites were examined: Jagiellonian University Library [<http://www.bj.uj.edu.pl>] and Warsaw University Library [<http://www.buw.uw.edu.pl>] from Poland, Princeton University [<http://libweb.princeton.edu/>] and Rutgers, The State University of New Jersey [<http://www.libraries.rutgers.edu/>] from the USA. Besides the previously mentioned purposes, the pilot study helped to correct the criteria to ensure that the same elements in both groups of Web sites can be classified as the same criterion in the questionnaire.

The main research was carried out during eight months from 1 September 2002 to 30 June 2003 (with a break for December 2002 and January 2003). Some additional research (caused by important changes in Polish libraries such as, for example, implementing new computer systems in a few of them) was carried out in September and October 2003. The library Web sites of the 25 best Polish universities according to "Rzeczpospolita" [9 April 2002, no. 83] and 25 best American universities (offering master and doctoral studies) according to U.S. News & World Report [<http://www.usnews.com/usnews/edu/eduhome.htm>] were examined and evaluated (see the complete list in Appendix I). Only the Web sites of central libraries or those representing the whole library and information system of a given university (in case there is no central library) were taken into consideration.

In total, 275 different elements of academic library Web sites were evaluated and analysed, including 237 elements regarding their contents and 38 regarding their usability. The elements were gathered in 79 general features regarding the contents and 9 relating to their usability. The evaluation process was based on a 7-point scale. The list of all features taken into consideration is presented in Appendices II and III. The questionnaire proved its relevance – all the elements and features identified during the research could be easily matched with relevant elements and features of the questionnaire and evaluated. The evaluation was conducted at a very detailed level, but its results were aggregated and presented at a general level of 12 broad areas relating to the contents and one relating to usability as well as at the more detailed level of 88 features.

Figure 1. The proportion of the highest scores to other scores

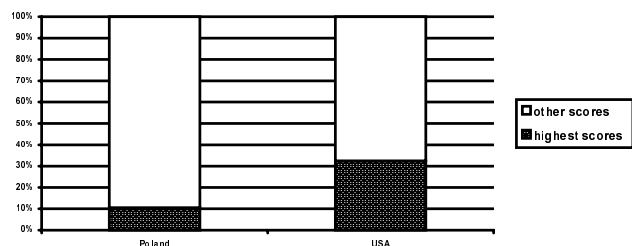
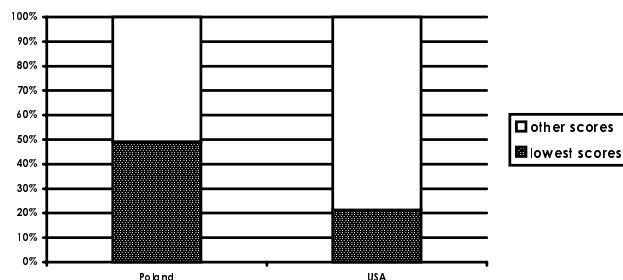


Figure 2. The proportion of the lowest scores to other scores



## Comparative analysis – contents

### The level of broad areas

The research revealed a great difference between these two groups of Web sites in the number and scope of resources and services offered. It became evident that in comparison with American sites, Polish academic libraries look very poor with only 10.6% of the highest scores (Figure 1).

The difference is even more evident when comparing the number of the lowest scores in both groups of Web sites. Such a score means that individual resources or services were not identified in a given Web site. Polish Web sites received 971 lowest scores. It means that on average 49.2% (almost a half) of analysed elements were not found in Polish academic library Web sites. In American Web sites the proportion is much smaller and equals only 21.2% (Figure 2).

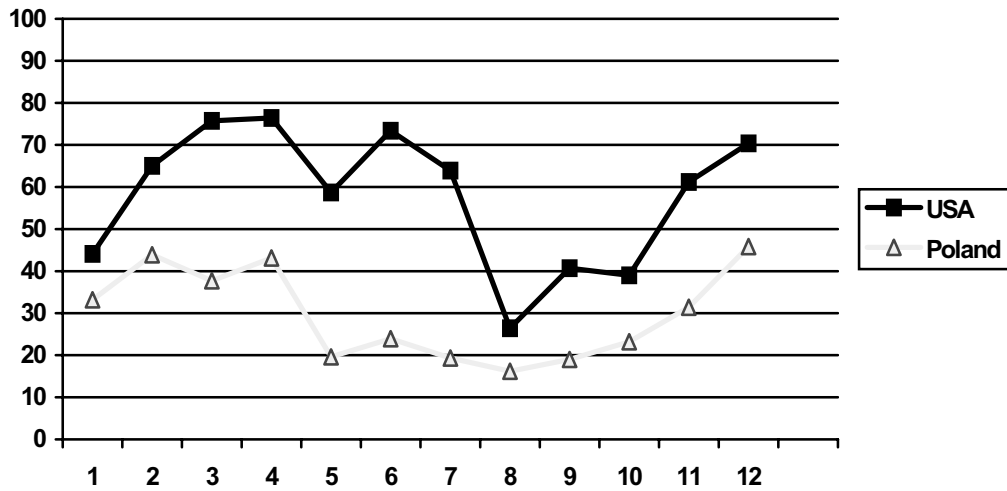
To get a deeper insight into the differences between these two groups of Web sites the comparison between the intensity of evaluated features in broadly defined areas relating to their contents was carried out (Figure 3). The intensity of a given feature or a group of features means here the total sum of all the scores received by Web sites from a given group (Polish or American) divided by the maximum possible score (when all the scores are the highest). This proportion is expressed as a percentage.

Even at first sight, two findings seem to be obvious. First of all, the lines do not cross each other at any point. The line illustrating the achievements of American Web sites is all the time above the one representing intensity of features in Polish Web sites. At this level of analysis there are no content areas in which Polish academic libraries surpass Americans' ones. As is clearly illustrated

by the graph the smallest gaps between the two groups of Web sites were identified in the following areas: "Information about the library and printed resources" (no. 1), "Scientific and professional activities" (no. 8) and "Library and Web site promotion" (no. 10), which are at the same time the most neglected by American libraries. On the other hand, Polish libraries perform much worse (in some cases even a few times worse) in the areas which were highly evaluated in American Web sites. This phenomenon is particularly recognisable regarding the following features: "Reference services" (no. 5), "Access to resources unavailable in a given library" (no. 6), "Education and instruction" (no. 7) and "Access to digital resources available only to authorized users" (no. 3). It became evident, that broadly speaking these two groups of Web sites are similar in weaknesses and totally different in respect of their strengths.

An indicator ("importance indicator") calculated as a ratio of average intensity of the features in a given area to average intensity of features in all the evaluated Web sites from a given country (Poland or the USA) represents the importance attached to particular features and whole areas by the library Web sites' editors (those who are responsible for their contents and usability) in both countries. This indicator illustrates the different emphases in Polish and American academic library Web sites eliminating the bias, which may result from great differences in intensity of features in most areas mentioned above (particularly general domination of American Web sites). An indicator greater than one means that a given area is treated better than average and an indicator less than one indicates areas neglected in comparison with others in a given group of Web sites (Figure 4).

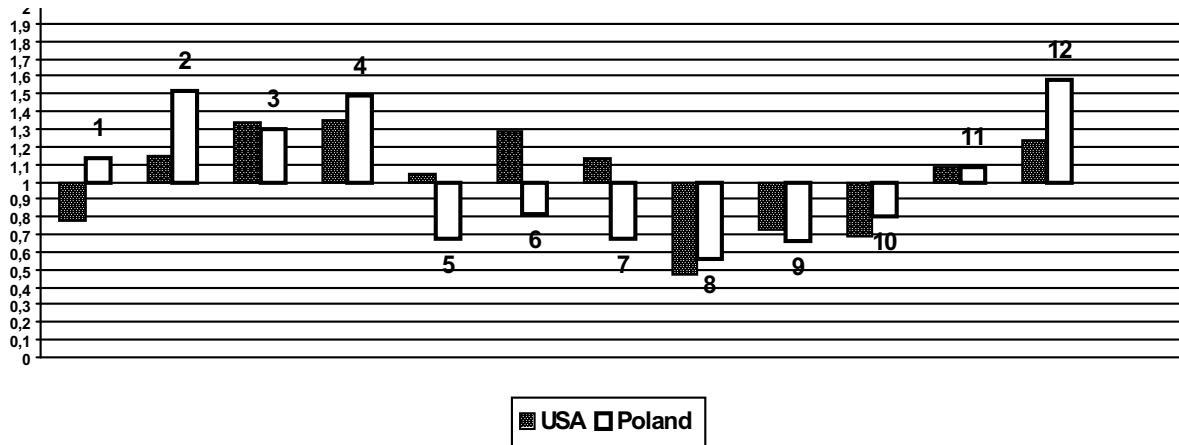
Figure 3. Average intensity of features in the areas relating to the contents in Polish and American Web sites



Key:

1. Information about the library and printed resources
2. OPAC
3. Access to digital resources available only to authorised users
4. Access to digital resources publicly available
5. Reference and information services
6. Access to resources unavailable in a given library
7. Education and instruction
8. Scientific and professional activities
9. Space for communication
10. Library and Web site promotion
11. Services and resources for other clients and collaborators (not for end-users)
12. Element of virtual information environment of the mother institution

Figure 4. Comparison between “importance indicators” of individual areas in Polish and American academic library Web sites



Key:

1. Traditional library and printed resources at a Web site
2. OPAC
3. Access to digital online resources available only to authorised users
4. Access to digital online resources publicly available
5. Reference information services
6. Access to resources unavailable in a given library
7. Education and instruction
8. Scientific and professional activities
9. Space for communication
10. Library and Web site promotion
11. Services and resources for other clients and collaborators (not for end-users)
12. Element of virtual information environment of the mother institution

Polish libraries, contrary to American ones, seem to attach particular importance to information about the library itself and about its traditional, printed resources. Furthermore, Polish libraries attach more importance to OPACs and organisation of access to digital online resources publicly available as well as to creating a unified virtual information environment of their mother institutions. Nonetheless, it should be stressed here that it does not mean that Polish Web sites are richer in individual elements in these areas than American Web sites (compare Figure 3). It shows relative differences in the weights of each area in both groups of Web sites. However, reference and information services, and access to resources unavailable in a given library, as well as education and instruction, are neglected by Polish Web sites. At the same time, these areas seem to be the most important and worth investing in American academic libraries.

### *The level of individual features*

There is insufficient space in this paper to present all the detailed research findings and analyses in this article. However, significant phenomena identified during the research are discussed.

In American academic library Web sites, among the highly evaluated features are those connected with different forms of access to various information resources (besides informative features and those describing relations with the mother institutions), such as: "Access to online reference resources, encyclopaedias, dictionaries and informative literature available only to authorized users", "Access to digital books and multimedia online resources publicly available" or "Access to digital books and multimedia resources available only to authorized users". In addition, library and information services are very well represented in American Web sites. Particularly the following features are rich in examples of best practices: "Borrowing items from ILL through the library Web site" or "Asking reference questions and sending queries through library Web site (including e-mail and other forms of online contact with subject specialists)". What is more, most Web-based services offered by American libraries can be completed on the Web. It means that users can start, proceed and complete their tasks (and this way try to satisfy their needs) wholly on the Web

without the necessity of coming to the library building. In Polish academic library Web sites, on the contrary, such features belongs to the worst represented and lag behind features representing relations and coherence with mother institutions - for example, "Coherence with the mother institution (the names and graphics)", "Access to the library Web site from the university home page" - or are positively informative (for example: "Library addresses, telephones, faxes and e-mails", "Current announcements on library events" or "Information on access and use of traditional resources"). Generally speaking, American Web sites offer actual services while Polish sites only inform about such services offered in traditional way (i.e. in person, not on the Web). For example, users of Polish academic library Web sites are informed that they are able to and allowed to borrow books from other libraries using inter-library loans services, but to order such books they have to visit the library building (sometimes several times).

Information services, access to resources regardless their physical location as well as education and instruction seem to be the most important goals of American academic libraries in designing their Web sites. In Polish ones, these areas are completely neglected or features that constitute these areas are only very poorly represented. It is particularly true for the following areas: "Asking reference questions and sending queries through library Web site"; "Borrowing items from ILL through the library Web site"; features: "Subject guides"; "E-mail notifications and informing about the library and its services"; "Alerting services and other forms of direct individual informing on publications in selected journals or disciplines"; "Direct borrowing from other libraries"; "Teaching and learning materials designed for various groups of users as well as different library and information services"; "Training and educational materials on searching information on the Internet; and "Training users in finding, handling and using information, conducting research and scholarly writing".

Furthermore, the evaluation process revealed that, even if a given feature is represented in Polish Web sites, it only very seldom rates the highest score. Only in two features did the best practices make more than 50% of all scores: "Library addresses, telephones, faxes and e-mails" and "Train-

ing and informing users about their rights and responsibilities". The following three features were noted in at least 40% of all the Polish Web sites: "URL and the titles (for bookmarks) of individual pages", "Coherence with the mother institution (the names and graphics)", and "Access to the library Web site from the university home page".

It became clear that analyses at the level of individual features generally proved the correctness of conclusions derived from the analyses carried out at the level of broad areas. American academic libraries focus on offering resources sought after by their users (regardless of their physical location), information and reference services and user training, whereas Polish academic libraries lay emphasis on informative functions of their Web sites and connections with their mother institutions. There is at least one similarity between these two groups of Web sites – both Polish and American attach importance to offering library resources on the Web. However, what is different is that Polish libraries seem to be interested in offering resources they possess, while American libraries try to offer resources that can satisfy their users' needs. This phenomenon illustrates a general difference in attitude to library policy and roles: American libraries appear to be user-oriented while Polish still take a resources-oriented approach. The following is a list of the few features (only 9 out of 79) better represented in Polish Web sites than in American ones; it illustrates and supplements the above findings and conclusions: "Information on access and use of traditional resources", "Information about card catalogues", "Scientific, scholarly and professional publications", "Professional and scientific image of the library", "Opinions about the library", "Promotion of the library commercial activities and enterprises", "Library addresses, telephones, faxes and e-mails", "Coherence with the mother institution (the names and graphics)" and "Access to the library Web site from the university home page".

Polish libraries, contrary to American ones, seem to be more interested in creating a scientific and scholarly image than in exposing user-friendliness or a strong orientation on services. What is also interesting is a difference in the way the libraries try to gain funds on the Web. American libraries use their Web sites intensively to collect all kinds of contributions from small, oc-

casional gifts to long term, regular funds ("Information for actual and potential sponsors"). Polish libraries try to use their Web site rather to inform about their own commercial activities. Considering such issues we must not forget that even if these features are better represented in Polish than in American Web sites, they still belong to those areas only very rarely found in the Web sites and are not exposed well.

Apart from obvious differences, there are also a few similarities between both groups of Web sites. The following features are totally neglected both in Polish and in American libraries: "Organizational activities (scholarly and professional)", "Discussion lists, newsgroups, chats etc" and "Possibility (and encouragement) of creating discussion lists or newsgroups as well as placing some materials on users' requests". It became evident that both Polish and American academic libraries do not attach importance to presenting their professional and scholarly activities (or their staff) on the Web. In both groups, we can also observe a clear aversion to offering their users free or at least not strictly controlled Web space for communication purposes. The information environment created by Polish and American Web sites is controlled and supervised by the libraries.

### *Comparative analysis – usability*

In contrast to numerous and great differences between Polish and American academic library Web sites regarding their contents (information, resources and services offered), usability dissimilarities are subtle. The research proved that American libraries are a little bit better than Polish, but not showing significant differences in quality. Polish Web sites received 54.8% of the total number of available points while American ones received 63.7% (see Figure 5).

Figure 5. The proportion of scored points to the total number of points that could be scored – usability

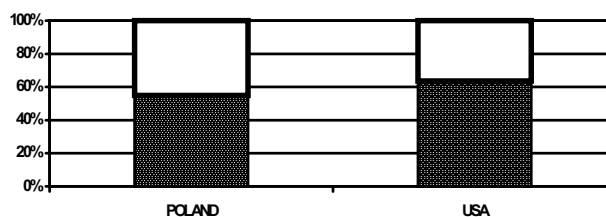
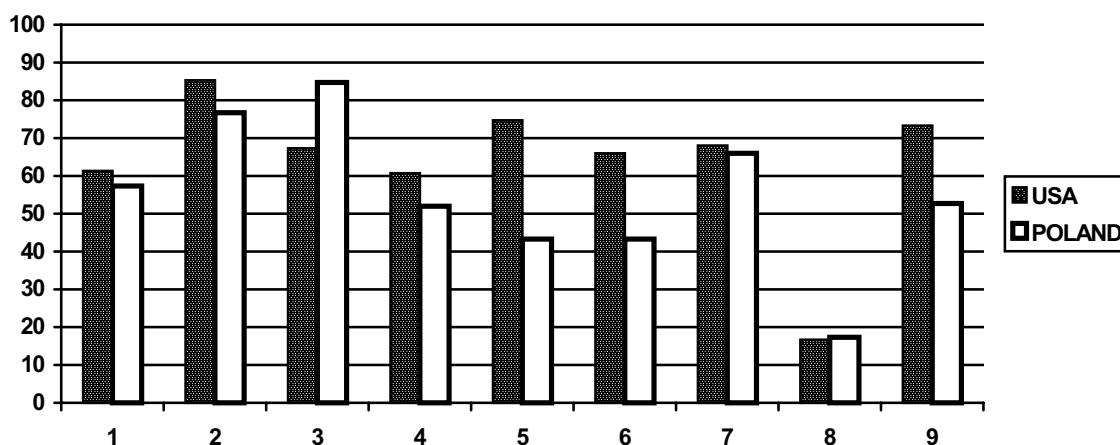


Figure 6. The comparison between the intensity of individual usability features in Polish and American academic library Web sites



- Key:
1. Clarity
  2. Communicativity
  3. Consistency
  4. Preventivity
  5. Navigation
  6. Efficiency
  7. Division
  8. Flexibility
  9. Topicality

Two (out of 9) usability features appeared to be better represented in Polish Web sites – their intensity revealed to be higher (for more explanation on the meaning of individual usability features see Appendix III): “Consistency” (relatively big difference) and “Flexibility” (minimal difference) (see Figure 6). Concerning the former, the difference in quality might result from the difference in size. Certainly it is easier to keep a small Web site consistent and coherent, and Polish Web sites are usually much smaller than American ones. Regarding the latter feature, the final result was strongly influenced by offering an alternative language version (English) of the whole or, most often, a part of Polish Web sites. Such a solution is almost unknown in American libraries.

What stands out from the Figure 6 is the relatively large gap between the two evaluated groups of Web sites regarding feature 5 “Navigation” as well as a little bit smaller gaps regarding 6 “Efficiency” and 9 “Topicality”.

American Web sites are, as a rule, well equipped with tools for global, local and contextual navigation both embedded and supporting. Many such tools are not implemented in Polish Web sites (for example, local search engines and maps), which,

since they are much smaller, could be used without them. However, a lack of good linking inside Polish Web sites (hypertext connections among various Web pages independent from general Web site structure and architecture) can cause many difficulties for their users – they are forced to follow always a tree-like structure of the Web sites and (quite often) to return to the home page in order to start new searches. Problems with efficiency in Polish Web sites result from unnecessarily long paths and a rather vertical architecture. In other words, users have to click and make many decisions directly connected with clicking before they can find the information they need. On the contrary, American Web sites tend to be rather horizontally organised and offer many so called quick links to the resources that are used most often.

Both Polish and American Web sites neglect “Flexibility” (no. 8). One could say that academic libraries in both countries expect standard information behaviour from their users not offering many alternative versions of their resources (for example, printer friendly) and ways of access to them, as well as the possibility of defining an individual interface.

Figure 7. General comparison

American academic libraries	Polish academic libraries
Services and information ready to use	Informative character (almost lack of services)
Some users' needs can be fully satisfied at the Web sites (they don't have to come to the library)	Incomplete services (even if they are offered, users have to come to the library)
Abundance and variety of digital online resources	Inconspicuous number of digital online resources
User-oriented information architecture	Library-oriented information architecture
Virtual version of the library	Library "shop window" and bridge between the Internet and the library

Although the differences mentioned above influence the quality of academic library Web sites, the research did not reveal any other specific elements or phenomena characteristic for any of evaluated groups of Web sites. This proves in some way the universality of usability features. All Web sites, regardless of their origins and to some extent their content, have to meet more or less common usability standards existing in the common information environment.

### Conclusions

Figure 7 summarises the finding of this study in its comparison of American and Polish academic library Web sites. Generally, there are three times more model solutions in American than in Polish Web sites. It became evident that Polish academic libraries concentrate on access to their own printed resources and start supplementing them with free electronic and publicly accessible resources. In contrast, American libraries concentrate their efforts on making available those resources (mainly digital and online) that are sought by their online users regardless of their physical location. At present, Polish Web sites are positively informative, exposing such elements as: information on access to printed materials, information about traditional card catalogues, basic addresses and contacts. Broadly speaking, Polish academic libraries treat their Web sites only as "shop windows" and points of access to the information about their book collections (through OPACs).

In comparison, American OPACs integrate the access to all offered resources regardless of their form, date of creation or location. American library Web sites are user-oriented while Polish ones still present a resources and library oriented attitude to information organisation and architecture and use the potential of WWW only to a minimal extend. While American academic li-

braries tend to perform all their functions wholly on the Web and to move as many services and resources as they can to the new online and digital information environment, Polish ones seem to treat their Web sites mainly as a means of passing information about themselves to the users.

Polish academic library Web sites today are neither tools for educating library and information users nor providers of information and reference services online. They also do not offer space for communication with various groups of library users, supporters and collaborators or for e-publishing. Furthermore, they are not intensively used as tools for promoting the libraries and their online services, creating their images and realising public relations tasks. On the other hand, the Polish Web sites can be seen today as providers of online information about printed resources collected by the libraries and tools for handling processes connected with accessing such resources and, to some extent, keystones for their mother universities' local Web environments. However, a comparison with American Web sites proved that these roles could be performed better. Polish academic libraries have made some efforts to make their Web sites gateways to online resources not fully integrated with the World Wide Web and access points to digital resources integrated with the Web but, once again in comparison with American ones, their achievements in these fields are far from being satisfying.

It seems that Polish academic libraries have not so far been forced to face the same challenges as American ones have. The massive increase in the number of students in Poland in recent years and the lack of serious competitors placed them in a comfortable position. Furthermore, the implementation of computer systems in the beginning of 1990s dominated their activities – Polish academic libraries have focused most of their computer-oriented efforts on cataloguing books

and journals. In general, they have not fully recognised the fundamental and substantial changes in university education and scholarly communication and are just trying to put the old body in new clothes. However, even if it is not clearly visible in Poland now, a comparison with the American situation proves that serious transformations will be indispensable. What is necessary today is a deep understanding of what is going on in academic libraries' field of operation and identifying possible directions of expansion. American Web sites, as much more advanced in all evaluated areas, can be used to construct a road map for improvements. Unfortunately, as the research proved, American Web sites are also not perfect and have some weaknesses regarding the roles they play in promoting the libraries, providing space for communication with various groups of library users, or participating in the processes of modern scholarly publishing. It means that such a road map should be enriched with solutions and elements not available or represented only to a very small degree at American Web sites. Some future research is needed to identify such features.

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*Appendix I:  
The list of evaluated Web sites in alphabetical order*

Library	URL
<b>AMERICAN LIBRARIES</b>	
Brown University Library	<a href="http://www.brown.edu/Facilities/University_Library/">http://www.brown.edu/Facilities/University_Library/</a>
Caltech Library System	<a href="http://library.caltech.edu/">http://library.caltech.edu/</a>
Carnegie Mellon University Libraries	<a href="http://www.library.cmu.edu/">http://www.library.cmu.edu/</a>
Columbia University Libraries	<a href="http://www.columbia.edu/cu/lweb/">http://www.columbia.edu/cu/lweb/</a>
Cornell University Library	<a href="http://campusgw.library.cornell.edu/">http://campusgw.library.cornell.edu/</a>
Dartmouth College Library	<a href="http://diglib.dartmouth.edu/">http://diglib.dartmouth.edu/</a>
Duke University Libraries	<a href="http://www.lib.duke.edu/">http://www.lib.duke.edu/</a>
Emory University Libraries	<a href="http://web.library.emory.edu/">http://web.library.emory.edu/</a>
Fondren Library [Rice University]	<a href="http://www.rice.edu/fondren/">http://www.rice.edu/fondren/</a>
Georgetown University Library	<a href="http://www.library.georgetown.edu/">http://www.library.georgetown.edu/</a>
Harvard Libraries	<a href="http://lib.harvard.edu/">http://lib.harvard.edu/</a>
Jean and Alexander Heard Library [Vanderbilt University Library]	<a href="http://www.library.vanderbilt.edu/">http://www.library.vanderbilt.edu/</a>
MIT Libraries	<a href="http://libraries.mit.edu/">http://libraries.mit.edu/</a>
Northwestern University Library	<a href="http://www.library.northwestern.edu/">http://www.library.northwestern.edu/</a>
Penn Library	<a href="http://www.library.upenn.edu/">http://www.library.upenn.edu/</a>
Princeton University Library	<a href="http://libweb.princeton.edu/">http://libweb.princeton.edu/</a>
Stanford University Libraries)	<a href="http://www-sul.stanford.edu/">http://www-sul.stanford.edu/</a>
The Sheridan Libraries of the Johns Hopkins University	<a href="http://www.library.jhu.edu">http://www.library.jhu.edu</a>
The University of Chicago Library	<a href="http://www.lib.uchicago.edu/e/index.html">http://www.lib.uchicago.edu/e/index.html</a>
University Libraries of Notre Dame	<a href="http://lib.nd.edu/">http://lib.nd.edu/</a>
University of California, Berkeley, Library	<a href="http://www.lib.berkeley.edu/">http://www.lib.berkeley.edu/</a>
University of Michigan Library	<a href="http://www.lib.umich.edu/">http://www.lib.umich.edu/</a>
University of Virginia Library	<a href="http://www.lib.virginia.edu/">http://www.lib.virginia.edu/</a>
Washington University Libraries	<a href="http://library.wustl.edu/">http://library.wustl.edu/</a>
Yale University Library	<a href="http://www.library.yale.edu/">http://www.library.yale.edu/</a>
<b>POLISH LIBRARIES</b>	
Biblioteka Główna Akademii Ekonomicznej w Poznaniu	<a href="http://www.ae.poznan.pl/bg/informacje.shtml">http://www.ae.poznan.pl/bg/informacje.shtml</a>
Biblioteka Główna Akademii Górniczo-Hutniczej w Krakowie	<a href="http://www.bg.agh.edu.pl/">http://www.bg.agh.edu.pl/</a>
Biblioteka Główna Akademii Medycznej w Gdańsku	<a href="http://www.amg.gda.pl/biblioteka/">http://www.amg.gda.pl/biblioteka/</a>
Biblioteka Główna Akademii Medycznej w Poznaniu	<a href="http://www.bg.am.poznan.pl/">http://www.bg.am.poznan.pl/</a>
Biblioteka Główna Akademii Medycznej w Warszawie	<a href="http://www.bibl.amwaw.edu.pl/">http://www.bibl.amwaw.edu.pl/</a>
Biblioteka Główna Akademii Rolniczej w Poznaniu	<a href="http://150.254.174.29/">http://150.254.174.29/</a>
Biblioteka Główna i Ośrodek Informacji Naukowo-Technicznej Politechniki Wrocławskiej	<a href="http://www.bg.pwr.wroc.pl">http://www.bg.pwr.wroc.pl</a>

Biblioteka Główna Politechniki Gdańskiej	<a href="http://www.bg.pg.gda.pl">http://www.bg.pg.gda.pl</a>
Biblioteka Główna Politechniki Krakowskiej im. Tadeusza Kościuszki	<a href="http://www.biblos.pk.edu.pl">http://www.biblos.pk.edu.pl</a>
Biblioteka Główna Politechniki Śląskiej w Gliwicach	<a href="http://www.polsl.pl/alma.mater/biblioteka.html">http://www.polsl.pl/alma.mater/biblioteka.html</a>
Biblioteka Główna Politechniki Warszawskiej	<a href="http://www.bg.pw.edu.pl/">http://www.bg.pw.edu.pl/</a>
Biblioteka Główna Szkoły Głównej Gospodarstwa Wiejskiego	<a href="http://www.bg.sggw.waw.pl/">http://www.bg.sggw.waw.pl/</a>
Biblioteka Główna Szkoły Głównej Handlowej w Warszawie	<a href="http://akson.sgh.waw.pl/biblioteka/">http://akson.sgh.waw.pl/biblioteka/</a>
Biblioteka Główna Śląskiej Akademii Medycznej	<a href="http://biblioteka.slam.katowice.pl/">http://biblioteka.slam.katowice.pl/</a>
Biblioteka Główna UMCS w Lublinie	<a href="http://www.bg.umcs.lublin.pl/">http://www.bg.umcs.lublin.pl/</a>
Biblioteka Główna Uniwersytetu Gdańskiego	<a href="http://www.bg.univ.gda.pl">http://www.bg.univ.gda.pl</a>
Biblioteka Główna Uniwersytetu Warmińsko-Mazurskiego w Olsztynie	<a href="http://bart.uwm.edu.pl/">http://bart.uwm.edu.pl/</a>
Biblioteka Jagiellońska	<a href="http://www.bj.uj.edu.pl/">http://www.bj.uj.edu.pl/</a>
Biblioteka Politechniki Poznańskiej	<a href="http://www.ml.put.poznan.pl">http://www.ml.put.poznan.pl</a>
Biblioteka Uniwersytecka w Łodzi	<a href="http://www.lib.uni.lodz.pl/library/">http://www.lib.uni.lodz.pl/library/</a>
Biblioteka Uniwersytecka w Poznaniu	<a href="http://lib.amu.edu.pl/">http://lib.amu.edu.pl/</a>
Biblioteka Uniwersytecka w Toruniu	<a href="http://www.bu.uni.torun.pl/">http://www.bu.uni.torun.pl/</a>
Biblioteka Uniwersytecka w Warszawie	<a href="http://www.buw.uw.edu.pl/">http://www.buw.uw.edu.pl/</a>
Biblioteka Uniwersytecka we Wrocławiu	<a href="http://www.bu.uni.wroc.pl/">http://www.bu.uni.wroc.pl/</a>
Biblioteka Uniwersytetu Śląskiego	<a href="http://www.bg.us.edu.pl/">http://www.bg.us.edu.pl/</a>

*Appendix II:  
The list of evaluated features – contents*

1. Traditional library and printed resources at a Web site
1.1 Scope and range of printed resources and collection development policy
1.2 Information on access and use of traditional resources
1.3 Photocopying, photography, printing and scanning in the library
1.4 Online ordering of copies from printed resources
1.5 Information about card catalogues
1.6 Information and Web-based services connected with lending printed resources
2. OPAC
2.1 Information on range and scope of online catalogues
2.2 Access to online catalogues
2.3 Online instruction to OPACs (in Web environment)
2.4 Individualization of OPACs' interfaces and services
2.5 Comprehensivity of services offered by a given OPAC
2.6 Possibilities of creating and editing bibliographical lists
2.7 Integration of access to information in online catalogues
3. Access to digital online resources available only to authorized users
3.1 Information on possible access to digital online resources available only to authorized users
3.2 Information on subject scope, profile and range of databases available only to authorized users
3.3 Access to e-journals available only to authorized users
3.4 Access to digital books and multimedia resources available only to authorized users
3.5 Access to online reference resources, encyclopaedias, dictionaries and informative literature available only to authorized users
3.6 Supporting the access and use of digital resources available only to authorized users
4. Access to digital online resources publicly available
4.1 Access to Web sites of other libraries
4.2 Access to digital books and multimedia online resources publicly available
4.3 Access to scientific, scholarly and educational subject gateways publicly available
4.4 Access to publicly available online reference resources, encyclopaedias, dictionaries and informative literature
4.5 Access to search engines and other tools supporting searching the Internet
5. Reference services
5.1 Information on reference services offered by a given library
5.2 Asking reference questions and sending queries through library Web site (including e-mail and other forms of online contact with subject specialists)
5.3 Subject guides
5.4 E-mail notifications and informing about the library and its services
5.5 Information on new acquisitions (printed and electronic)
5.6 Alerting services and other forms of direct individual informing on publications in selected journals or disciplines
6. Access to resources unavailable in a given library
6.1 Information about the rules and procedure of interlibrary loans
6.2 Borrowing items from ILL through the library Web site
6.3 Access to information enabling location of sought-after books or journals in other libraries' collections
6.4 Access to Web resources of other organizations offering information about publications
6.5 Possibility of suggesting new acquisitions
6.6 Direct borrowing from other libraries

7. Education and instruction
7.1 Web-based library instruction
7.2 Teaching and learning materials designed for various groups of users as well as different library and information services
7.3 Training and informing users about their rights and responsibilities
7.4 Possibilities of arranging library instruction in real life through e-mail or other Web-based facilities
7.5 Training and educational materials on searching information on the Internet
7.6 Training users in finding, handling and using information, conducting research and scholarly writing
8. Scientific and professional activities
8.1 Organizational activities (scholarly and professional)
8.2 Research and development projects
8.3 Scientific, scholarly and professional publications
9. Space for communication
9.1 Communication between the library and its users
9.1.1 Identification of people responsible for each library and information service
9.1.2 Receiving and reacting to users' complains and suggestions regarding library performance and the quality of its Web site
9.1.3 Responsibility for the whole Web site as well as for its subsites and individual pieces of information
9.1.4 Contact with a professional responsible for technical performance of library Web site
9.1.5 Current announcements on library events
9.1.6 E-mail notifications regarding circulation (due time, fines, recalls, etc.)
9.2 Communication among users
9.2.1 Discussion lists, newsgroups, chats etc.
9.2.2 Possibility (and encouragement) of creating discussion lists or newsgroups as well as placing some materials on users' requests
9.3 Communication with and among library staff
9.4 Communication with library environment
9.4.1 Press release and other materials for media
9.4.2 Reports and library statistics
9.4.3 Mission statement
9.4.4 Communication with library advocates
10. Library and Web site promotion
10.1 URL and the titles (for bookmarks) of individual pages
10.2 Graphical distinctness and logo
10.3 Professional and scientific image of the library
10.4 Opinions about the library
10.5 Information on facilities offered for special groups of users (including disabled people)
10.6 Promotion of exhibitions and other events organized by the library
10.7 Promotion of the library commercial activities and enterprises
10.8 Library gadgets
10.9 Positive results of user surveys
11. Services and resources for other clients and collaborators (not for end-users)
11.1 Library addresses, telephones, faxes and e-mails
11.2 Library management team and staff
11.3 Information for actual and potential donors
11.4 Information for actual and potential sponsors
11.5 Interlibrary loans for other libraries (information and Web-based services)
11.6 Recruiting new personnel for the library

12. Element of virtual information environment of the mother institution
12.1 Information about all the libraries and information services within a given university
12.2 Access to Web sites of other university units
12.3 Coherence with the mother institution (the names and graphics)
12.4 Possibility of searching resources of other libraries belonging to the same university
12.5 Access to the library Web site from the university home page
12.6 Information directly connected with teaching and learning processes realized by the mother institution

*Appendix III:  
The list of evaluated features - usability*

1. Clarity (I always know where I am, where I can go and what is going on)
2. Communicativity (I understand what the Web site is talking to me)
3. Consistency (I am never surprised, the information architecture, layout and contents are predictable)
4. Preventivity (it is difficult to make a mistake, it is easy to correct it)
5. Navigation (I can use appropriate tools to navigate easily to each part of the Web site)
6. Efficiency (I can get what I want easy and quickly, maximum profits at minimum investment)
7. Division (suitable portions of information, one topic in one place or well linked)
8. Flexibility (I can adjust the interface so it better serves my personal needs; I can choose from different versions of resources offered those which I prefer)
9. Topicality (the information is up-to-date and topical and I am informed about this)