



Evaluation of Digital Library User Interfaces Worldwide to Propose Design Criteria

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Abstract

Purpose: This research aims to evaluate the user interfaces of the English web pages of selected national digital libraries, based on the established criteria found in the resources to propose a suitable interface for the Payame Noor University digital library.

Method: This research employed a survey and descriptive methodology. A checklist included 10 main criteria and 114 sub-criteria was used for evaluation. The study population included digital libraries from various countries including America, Australia, France, Swiss, New Zealand, Netherland, Poland, Japan, India and Italy. Data analysis was performed using SPSS software and Excel. The hypotheses and questions were tested by t-test and Friedman-test.

Findings: The conclusions indicated that 50% of criteria were met by 50% of libraries. The American library ranked first, meeting 70.40% of criteria, followed by France at 62.07% and Swiss at 40.12%. Also the interface language criterion was the most frequently implemented, with a usage rate of 6.68%. User control was the least implemented used also at 6.68%.

Conclusion: The research findings indicate that the most libraries have been successful with the general criteria, and the majority of points earned pertain

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to adherence to these general criteria on their website pages. In particular, no attention has been paid to the criteria encompassing the scope of digital libraries' duties, as per definitions. As observed in the findings, the interface language criterion shows the highest level of compliance. One possible reasons for this consistency across all libraries may be that the primary language in these countries is not English, leading to efforts aimed at enhancing user convenience and greater interaction of the user through careful attention to writing-related aspects on the pages. Furthermore, compliance with writing points and brevity of sentences is a key category in web pages design.

Keywords: Digital library, User interface, Evaluation research, Evaluation criteria

Introduction

The user interface plays a critical role in shaping both the cognitive and practical experiences of users. A well-designed interface enables users to access, interpret, and apply information resources effectively; therefore, careful consideration of its features during the design process is essential. Over the past few decades, the rapid advancement of information and communication technologies (ICTs) has significantly influenced nearly every aspect of human life, with particularly profound impacts on information environments. Libraries, as key information institutions, have not been exempt from these changes. The integration of new technologies into library systems has led to the development of digital libraries. The mission of digital libraries is to provide users with access to diverse resources and services—independent of time and place—while supporting multipurpose and multimedia usability. To achieve this mission, digital libraries must deliver their resources and services through effective and user-friendly interfaces on the World Wide Web (Rahimi et al., 2018). The implementation of digital libraries demonstrates an awareness of users' evolving expectations in modern contexts. To satisfy these needs efficiently—particularly in digital environments—systems must offer intuitive platforms that enable seamless user–system interaction. Such platforms are known as user interfaces, which serve as the mediating layer between users and computer-based environments, including websites, databases, and software, by facilitating bi-directional information flow (Sastry & Reddy, 2009).

A well-structured and user-friendly interface plays a decisive role in attracting users to an information system and ensuring they continue to engage with it effectively. Poorly designed interfaces often frustrate users and result in abandonment, while effective interfaces enhance usability, satisfaction, and long-term system adoption. Therefore, the design of the user interface is a fundamental determinant of the overall success or failure of information systems (Shneiderman & Plaisant, 2010). Alijani and Dehghani (2016) believe that since the user a good user interface makes users better identify their path in the database and has a significant impact on their performance. In fact, in the recovery process, the user interface is the only communication bridge that connects the user with information recovery systems.

The more users' needs are considered in the design of digital library pages, the more the user's interaction with the system will be and the goal of obtaining more information resources will be achieved. In fact, the more

appropriate criteria are considered in the design of the user interface of digital library pages, the more successful the library is in communicating with its users. Due to the rapid progress of computer science and new designs in web pages, we see rapid changes in the user interface of these pages. Therefore, designers of digital library pages should continuously improve the user interfaces of libraries. Therefore, the need for continuous evaluation seems necessary in this field. Norouzi and Alipour Hafizi (2018) identify the interface level as one of the key dimensions in evaluating digital libraries. At this level, the main objective is to assess the extent to which a digital library's user interface is accessible, searchable, navigable, and supportive, ensuring that users can efficiently locate, retrieve, and interact with information resources.

The effectiveness of the user interface plays an important role in the success of Payam Noor University digital library platform, and the design and quality of a user interface directly affects the retrieval of desired information from it. In this research, an attempt has been made to evaluate the user interface of some digital libraries to achieve a pattern for Payame Noor Digital library.

Libraries of Payam Noor University have a worthy share in transmission of information and its digital libraries are forced to reconsider their duties and maybe in the future, and their situation should be such that they leave a deep impact on the development and evolution of libraries and information in the country. As a result, they are forced to develop digital libraries to accompany these functions. But creating a suitable digital library for Payam Noor University requires a practical model. Lack of a single standard or model in this field has caused problems for users in using these systems. Considering the importance mentioned in the design of a suitable user interface and the placement of digital libraries of Payam Noor University, the necessity of research in this field is obvious. In this research, by examining the user interface of digital libraries of selected digital collections that have English web pages and comparing them with the criteria found in texts and sources, the richest library among the studied community has been identified in terms of user interface. so that by using it, an objective model in this field can be provided to the designers of digital libraries and especially to the designers of the digital library of Payam Noor University.

Literature Review

Entazaryan and Fattahi (2009) conducted a research with the aim of

analyzing, explaining and identifying the strengths and weaknesses of important elements and features in the interface of information databases of the Regional Science and Technology Information Center and Research Institute of Information and Scientific Documents, The compatibility of the interface environment of the investigated websites with Nielsen's 10 components, the basic problems of the interface environment of these websites and also the difference between the level of understanding of expert and beginner users were measured. The findings showed that the degree of concordance of the interface of the Research Institute's database with Nielsen's 10 components is generally average and that of the Regional Center's database is slightly above the average. Both databases have basic problems in some components of the Nielsen's model.

Faraj Pahlo and Zavaraghi (2013) have done a research on 6 Web OPACs of Public Libraries Foundation in terms of display features and user interface. In terms of performance, Pars Azarakhsh won the first place with 98.2 points, then Noosa with 93.6 points, Piam with 89.4 points, Arakel with 77.6 points, Irandoc with 68.2 points, and Ganjineh with 36 points were ranked second to sixth, respectively. In terms of user interface, Pars Azarakhsh, Noosa, Payam, Arakle, IranDoc and lastly Ganjineh were placed.

Mohajeri and Mohammad Salehi (2013) in evaluating the features and constituent elements of Rasa software came to the conclusion that in the design of the user interface of this software according to the ten components of the check list; 64% of the necessary criteria have been observed; Aesthetic field has the highest agreement with 90% and error prevention has the least agreement with 70%.

Norouzi and Alipour Hafizi (2018) by reviewing the texts that have studied the topic of user interface, after specifying the criteria mentioned in various texts (such as navigation, search, design, guidance, error correction, information display, learning ability , user control, comprehensiveness, language, feedback, simplicity, compatibility with the external environment, personalization, user support, interaction, compatibility, viewing the system status, user background, flexibility) concluded that among these criteria, criteria such as navigation, search, design and guidance are the most important in terms of the frequency of repetition among the studied texts and sources, and criteria such as compatibility, system status observation, user background and flexibility are less important than other criteria.

Mohammad Ismail and Kazemi Kohbanani (2022) conducted a

comparative evaluation of the usability of the national libraries' websites of Iran, Iraq, and Turkey based on 160 components. Using a hypothetical website score of 663 as a benchmark, they determined that the website of the National Library of the Islamic Republic of Iran ranked first with 594 points, followed by Turkey with 485 points, and Iraq with 330 points.

Chu and Rosenthal (1996) in a research compared three search engines Alta Vista, Excite and Laikas in terms of search capabilities (Boolean operators, field search and phrase search) and retrieval performance, and finally, it was determined that the search engine Altavista performs better than the other two engines in terms of search ability and retrieval performance.

Haque (2002) evaluated seven search engines in terms of the various options available in the user interface of these engines. The findings of this research showed that Google search engine has provided more options in its user interface. In this comparison, the final result of this research is that although the Google search engine offers more options, some other options are more respected in the user interface of other search engines and it is suggested that the user conduct her/his search in other engines as well.

Zeng and Cheng (2003) evaluated criteria in 20 metasearch engines and made tables in the categories of coverage, display of results, search logic, performance and search control options. Then they compared all the engines based on the tables and finally, after identifying the strengths and weaknesses of the search engines, they came to the conclusion that they introduced Carto and Inforgrid metasearch engines as the chosen ones.

Vilar and Zumer (2005) evaluated the user interfaces of four major e-journal databases: Science Direct, ProQuest Direct, EBSCO Host, and Emerald. They assessed these platforms based on general interface features, database selection options, result manipulation capabilities, and help options. The findings indicated that, due to the commercial nature of all four systems, there was significant similarity in their user interfaces. However, some differences were also observed. Specifically, Science Direct and ProQuest Direct offered more extensive general features, ProQuest provided superior database selection options, and both Science Direct and ProQuest excelled in result manipulation and help options. Ultimately, the researchers concluded that all four platforms possessed quality user interface facilities.

Method

In this study, an attempt has been made to conduct the present research by

combining literature review with a descriptive survey, Delphi and evaluative methods. The literature review was used to prepare the check list, and after reviewing the researches on the texts and sources, the research of Norouzi and Alipour Hafizi (2018) was selected as the basis and it was adapted for the current research by using other researches. A Delphi panel was used in the research and a descriptive survey method was used to evaluate the libraries. Data collection was done using the direct observation method, in such a way that each component was evaluated on the desired web page and the desired score was entered. The statistical population of this research was the 10 digital libraries of different countries. The addresses of libraries that have digital libraries or digital resources were extracted. Then, the final list of libraries was selected from the addresses that had English web pages, which were selected after searching in Europe, North and South America, Asia and the Pacific Ocean countries for digital libraries. The titles of selected digital libraries are given in table 1. It should be mentioned here that there were some digital libraries where only the first page (home page) was in English or they were in a non-English language, which were excluded from the selected population of this study. In addition to these, it is possible to mention cases such as databases such as dissertations, etc., which were introduced as digital libraries in some cases, and these cases were also excluded from the statistical population. In other words, it can be said that these cases were not consistent with the definition of digital library in the present study.

Table 1. Selected Digital Libraries, and Their Internet Addresses

Name of the Library	Internet Address
National library of Australia (Digital collection)	http://www.nla.gov.au/digicoll/
National library of America (American memory)	http://memory.loc.gov/ammem/index.html
National library of France (Digital library)	http://gallica.bnf.fr/?&lang=EN
National library of Swiss (Digital collection)	https://www.ehelvetica.nb.admin.ch/pages/main.jsf
Newzeland national digital herittage archive	http://ndha-iki.natlib.govt.nz/ndha/pages/Bugs
National digital library of Poland	http://www.polona.pl/dlibra?action=ChangeLanguageAction&language=en
National library of Netherland (The memory of the Netherland)	http://www.geheugenvannederland.nl/?en/homepage

National Diet Library (digital library of Japan)	http://www.ndl.go.jp/en/
Indian national digital library in engineering science and technology	http://paniit.iitd.ac.in/indest/
Italian Digital Library	http://www.iccu.sbn.it/opencms/openms/en/main/bdi/index.html

Data about user interfaces is usually done in two ways: users' judgments and researchers' judgments (based on expertise) (Vilar, 2005). In judging by users, a group is usually selected who express their opinions about the user interface after the initial training. In judging by researchers, the researcher studies the user interface. The judgments made by researchers can lead to the discovery of errors, improvement of the user interface and providing guidance for conducting similar research and designing similar user interfaces. In this regard, the current research is of the second type, in the sense that the data was collected based on the personal judgment of the researchers. To conduct this research, data collection was done using direct observation method and checklist. In preparing this checklist, many sources and checklists were studied and finally a checklist was selected.

After reviewing the researches, Norouzi and Alipour Hafizi (2018) was selected as the basis and adapted for the current research by using other researches. The desired list was first extracted the most frequent criteria and components after studying the available texts and sources in this field and then using the opinions of experts and finalized it using the Delphi method. Due to the fact that this list was the most complete research in terms of the number of evaluated criteria and the mentioned components in the field of user interface of digital libraries, this model was used for the present research. Also, its validity has been justified by the Delphi method, and as a result, the researcher decided to use the mentioned model in examining the user interface of the digital libraries in question. Validity and reliability of criteria considering that the criteria used in this research are the criteria used in Norouzi and Alipour Hafizi (2018), the result of this research is reliable. Also, the validity of the criteria is confirmed using the Delphi panel. In the recent years, this confirmation method has also been used for validity (Tabibi et al., 2008). The minimum number of panel members to obtain a reliable result depends on the research design. In ideal conditions, even groups of four can perform well. One of the advantages of Delphi is content validity and designing programs with the relative support of participants (Ahmadi et al., 2007).

Descriptive statistical methods have been used to analyze the data of

this research. Data was also analyzed using SPSS and Excel software. The basis of the analysis was prepared list information, which scores are based on yes (1) and no (0). Also, due to the quality of some of the sub-components, it was possible that the studied libraries did not comply with them equally, or in other words, absolute presence or absence could not be applied to them. Regarding these components, in addition to the two levels, i.e. zero and one, a score of 50% equivalent to the average has also been used. The score obtained by each of the studied libraries in relation to each of the components is multiplied by the average coefficients obtained (weighted average) by the components from the Delphi panel. It should be noted that the weighted average of each of the components is given in the relevant tables in front of the sub-components related to each of the ten criteria.

Findings

Table 2 shows the status of studied libraries regarding the sub-components and criteria of digital library user interface. The results of the search criterion showed that the French library has a better situation than other libraries with 126.43 points (84.89%) in this criterion, then the Australian libraries are in the second and third places with 78.63% compliance with the criteria. The Italian library scored 9.49 points (6.36%) compared to other libraries. Indian libraries are ranked ahead of India with 41 points (27.48%). Among the 10 libraries examined, 9 libraries have met more than 50% of the search criteria (more than 50% of libraries). Also, among the components related to the search criteria, the degree of compliance with the components of "simple search capability" and then "natural search capability" and "phrase search capability" has been higher than other components, which shows the necessity of these components in library user interface design. The components of "proximity search capability", "suggest related keywords" and "marking of search results" have received less attention than all the components. These components are specialized components in the field of digital libraries, and their absence is a sign of the weakness of library user interface design in terms of search criteria. The "suggest related keywords" component is effective in reducing the user's memory load and saving time.

Table 2. Search Criteria Components in Studied Libraries

Row	Search criteria components	weighted average	Country									
			Australia	America	France	Switzerland	New Zealand	Netherlands	Poland	Japan	India	Italy
1	Simple search capability	9/49	1	1	1	1	1	1	1	1	1	1
2	Advanced search capability	10	1	0	1	1	1	1	1	1	0	0
3	Ability to search poly	8/89	1	0	1	1	1	0	1	0	0	0
4	Proximity search capability	7/95	1	0	0	0	0	0	0	0	0	0
5	Phrase search capability	9	1	1	1	1	1	1	1	1	1	0
6	Ability to search images	6/55	1	1	1	0	0	1	0	0	1	0
7	Natural search capability	8/29	1	1	1	1	1	1	1	1	1	0
8	Field search capability	8/49	1	1	1	1	1	1	1	1	0	0
9	The ability to shorten search terms	2/8	1	1	1	1	1	1	1	1	0	0
10	The ability to limit the search	55/8	1	1	1	1	0	1	1	1	0	0
11	Ability to suggest related keywords	69/6	0	0	0	0	0	0	0	0	0	0
12	Ability to rank search results	75/8	1	1	1	0	0	1	1	1	0	0

13	Ability to bookmark search results	95/7	0	0	0	1	0	0	0	0	0	0
14	Ability to save search results	8/39	1	1	1	0	0	1	0	0	0	0
15	Ability to send search results	7/69	1	1	1	0	0	0	0	0	0	0
16	Possibility of establishing a link from search results to related information	8/8	0	1	1	0	0	1	1	1	0	0
17	Ability to search results	7/95	1	1	1	0	1	1	0	0	1	0
18	Ability to change the search language	8/75	0	0	1	1	0	0	1	1	0	0
Sum of points		179/5	11/39	90/9	127/3	74	6/63	10/7	9/29	87/6	4	9/49
% of points		100	78/63	63/7	84/89	6/51	4/65	6/8	6/50	5/56	2/4	6/36

As Table 3 shows, the total number of points related to the ten criteria examined in this research is 923/97 points. Among the 10 libraries examined, 8 libraries have managed to get more than 50% points. Digital Library of America with 598/68 points (70.42%), France with 573.56 points (62.09%) and Switzerland with 569.07 points (61.59%) are in the first three positions, respectively. The digital library of Italy is in the last place with 50.366 points (40.14%).

Table 3. The Total Ccores of the Studied Digital Libraries from the General Criteria

	Total score for each criterion	Australia	America	France	Switzerland	New Zealand	Netherlands	Poland	Japan	India	Italy
Search	149/5	117/3	99/09	126/7	94/10	69/63	101/7	96/29	87/6	41/02	49/9

criteria											
Search criteria	63/35	56/8	56/8	56/5	56/8	56/8	48/4	56/8	56/8	63/35	59/15
guidance	116/21	41/66	93/14	75/68	56/75	72/78	33/95	8/75	50/3	50/35	8/09
Information display standard	94/66	78/87	34/09	54/66	48/73	64/45	42/73	17/59	40/66	17/59	39/31
Page design criteria	162/9	96/9	134/3	132	136/5	121/2	124/3	123/8	136	121/2	94/35
Leadership standard	151/6	85/97	93/4	102/4	112/7	69/36	64/65	75/83	86/5	65/16	79/78
User control criterion	56/08	0	8/6	17/35	0	17/35	0	4/4	0	0	0
Standard user interface language	34/2	34/2	34/2	34/2	34/2	34/2	34/2	34/2	34/2	34/2	29/99
Error correction standard	45/65	36/77	47/45	29/79	38/11	0	22/6	0	22/6	31/59	0
Simplicity criterion	50/05	50/05	50/05	41/65	50/05	45/95	41/65	33/5	41/6	50/05	41/95
Total points of all criteria	924	560	598	573	569	551	513	446	556	474	366
% points	100	60/7	70/4	62/09	61/5	59/7	55/5	48/3	60/2	51/3	40/1

A suitable test was determined to rank the libraries of the countries under study in accordance with the criteria. Table 4 shows the results of the ranking of the countries based on Friedman's test. The Digital Library of America with an average rank of 9.01, France with an average rank of 9.00 and Switzerland with an average rank of 8.81 are in the first to third ranks, respectively. The digital library of Italy with 41.6 is one of the three libraries at the bottom of the table.

Table 4. Ranking of Countries Based on Friedman's Test

Digital libraries	Average rating
America	9/01
France	9/00
Switzerland	8/81
Australia	8/86
Japan	8/21
New Zealand	7/79
Netherlands	7/96
India	7/81

Poland	7/27
Italy	6/41

As can be seen in Table 4, there is a significant difference between the standards in the digital libraries of the countries. Also, the validity of the test based on the Friedman test is 0.000, which means it is less than 0.5. Therefore, it can be said that the ranking of these factors is different, that is, countries are different in terms of meeting the criteria.

As Table 5 shows, after calculating the average of each criterion, the percentage of points obtained for each criterion has been calculated. The total score of the criteria is 1195.54. From the obtained information, it is clear that among the ten criteria, the user interface language criterion has the highest level of compliance among the criteria by obtaining 98.35% of the criteria's points. Another criterion that is in the next position is the criterion of simplicity. Compliance with the components of this standard also seems necessary in terms of facilitating the user's communication with the desired library.

Table 5. Total Scores of the Examined Criteria in Digital Libraries

Digital library	Search criteria	Cohesion criterion	Guidance	Show information	Page design	Management	Control	Interface language	Error correction	Simplicity
Australia	117/39	568	58/15	78/87	96/96	85/97	0	34/2	36/7	50
America	99	568	93/1	34	134/3	93/4	8/6	34/25	47/45	50
France	126/7	568	75/68	54/6	132	102/3	1/35	34/2	29/7	41/6
Switzerland	94/1	568	56/7	48/7	136/5	112/7	0	34/2	38/1	50
New Zealand	69/6	40/1	72/8	64/4	121/2	69/3	1/35	34/2	0	45/9
Netherlands	101/7	48/4	33/9	42/7	124/3	64/6	0	34/2	22/6	41/6
Poland	96/3	568	8/75	17/5	123/8	75/8	4/4	34/2	0	33/5
Japan	87/6	568	50/3	40/6	136/6	86/5	0	34/2	22/6	41/6
India	41	63/3	50/3	17/6	121/2	65/2	0	34/2	31/6	50
Italy	9/4	59/1	8/09	39/3	94/3	79/7	0	29/9	0	41/9
Standard score	149/5	63/3	11/2	94/6	162/9	151/6	5	34/2	45/6	50
Total points	119	83/4	66/1	600	180/7	102/7	5/21	505	38/1	684
average score	79/7	55/6	44/6	40	120	85/6	3/77	33/6	25/7	45/6

The percente of points earned	53/4	87/8	38/4	43/3	73/9	56/4	67	98/3	54/6	91/2
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Research hypothesis was that more than half of the studied digital libraries, in the design of their user interface, have observed the evaluated criteria at a level of more than 50%. In order to test this hypothesis, t-test was used. According to Table 6, it can be seen that the value of the test statistic is equal to 2.34 and it is more than 1.66, which means that the null hypothesis of the above statistic is not accepted. Therefore, it can be said with 95% certainty that more than half of the studied national digital libraries, in designing their user interface, have followed the evaluated criteria at a level of more than 50%, so the assumption is confirmed.

Table 6. Test Statistic Values for Testing the Hypothesis

Number of observations (components)	Average	t-statistic value	Critical value
114	0/59	2/34	1/66

Conclusion

It can be said that more than half of the studied digital libraries, in designing their user interface, have followed the evaluated criteria at a level of more than 50%. As mentioned earlier, the general standards followed by these libraries have made the scores of these libraries acceptable in complying with these components and increasing the compliance of the components by most of the libraries. Digital libraries should be able to improve and speed up information access methods. The existence of various components of search functionality facilitates this possibility. The presence of various search capabilities is effective in more user interaction. The interaction steps should be in such a way that the loading of the memory is low and short.

Due to the fact that the information society is developing rapidly, the time validity of information may also change rapidly, so it is necessary to mention the date of updating on the pages of digital libraries. The non-activation of library links is another reason for the library not being up-to-date. Therefore, it is recommended to include the update date on all pages.

The characteristics of digital libraries are the expansion of self-service, so proper guidance of the library helps in this goal. Another feature of digital libraries is the elimination of human factors. As a result, it is

necessary to have options to ask the librarian. The digital library should be able to provide appropriate guidance to users to enable them to obtain the information they need in desired formats.

Using the right combination of colors, fonts, shading options to distinguish them from nearby options, using clear images and symbols, etc., all affect the user's understanding of the system, which is relatively well observed in the studied libraries. has been But some options require more attention.

Determining mandatory information entry fields allows the user to easily get the desired results, which, based on the findings of this research, has not been observed by any of the libraries. The use of graphics, sound and images is effective on the user's understanding and makes the environment more enjoyable.

Personalization, due to the fact that it identifies the user's needs and successfully solves them, establishes a satisfying relationship between the user and the system, therefore, it should be considered in the design of digital libraries. Users of a computer information system may be different in terms of physical and cognitive abilities, personality traits and cultural factors.

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in terms of physical and cognitive abilities, personality characteristics and cultural factors, and these differences should be considered in the design of user interface elements and features so that different groups of users are satisfied with the computer system.

Error correction criteria, although they are important for the interaction of the user with the system and reducing the user's error during work, very little has been considered in the design of the interface in the studied libraries. The method of writing, notification and design of error messages should be taken into consideration in order to attract the user's attention due to the elimination of human factors. However, by looking at the observed components, it is clear that most of the libraries have been successful in complying with the general criteria and most of the points obtained are related to the compliance of the general criteria that are considered in the web pages and special attention is paid to Criteria that do not include the scope of digital libraries according to the definitions. As seen in the findings, the standard of interface language had the highest level of compliance. One of the reasons for observing the components of this standard in all libraries could be the fact that the language of these countries is not English, and for this reason, for the convenience and interaction of the user, it has been tried to observe the writing notes related to the pages. Also, observing the writing points and brevity of the sentences is one of the important and main categories in the design of web pages. the following suggestions are presented:

A successful digital library for Payame Noor University is a library that despite the complexity of its system, can provide information to users simply and with as little time as possible. Also, by providing various options and facilities considered in this study, it will make the user unnecessary to go to the physical library and provide maximum information for her/his needs. Therefore, based on the findings of the research, suggestions are made to improve the user interface of digital libraries planned for Payame Noor University:

- In addition to observing the general components of the search, it seems necessary to observe the specific components such as proximity search, related keyword suggestions, search results marking, in order to save the user's time.
- The existence of the site map facilitates the use of the library for the user.
- Information display criteria should be given more attention in order to make system information accessible.
- Reducing the time spent by the user and attracting and maintaining the

user need attention. Users expect the elements on the first page to be important, so the presence of a site map, and access to pages with many visitors, are among the necessities.

- In the design of the user interface, in addition to the criteria that are considered in the design of public websites, special criteria should be given special attention.

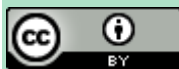
CONFLICT OF INTEREST: The authors declare that they have no conflicts of interest regarding the publication of this manuscript.

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