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Usability Evaluation of Digital Libraries in Tehran Public Universities

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Abstract

For a sustainable development and greater success, digital libraries need to be evaluated at different time points. Usability study is a type of digital library evaluation.The aim of this study is identifying the usability of digital libraries in Tehran's public universities i.e. Sharif, Amirkabir and Tehran universities. Evaluative Survey methodology was used for the survey applying measures of search, navigation, forms layout, contrast and scan ability, optimization, help, usage of windows and speed and errors through a questionnaire containing 36 questions. The research population included 124,800 undergraduate, Master and PhD students, from three governmental universities of Sharif, Amirkabir and Tehran. Stratified random sampling method was applied to select 378 students as a sample which are 130 people in Tehran, Amirkabir 125 people and Sharif 123 people. For data analysis, SPSS software was used along with descriptive techniques as well as independent test and ANOVA where needed.The findings indicated that the criteria relating to the usability of digital libraries in the three Tehran governmental universities evaluated to be in relatively good condition and there is no significant difference between the digital libraries for the usability criteria. The results of this study suggest that according to the usability of digital library design creates more willingly resort to this type of user to visit the library and the realization of the objectives of the parent organization provides.

Keywords: Evaluation, Usability, Digital library, Public Universities, Sharif University of Technology, Amirkabir University of Technology, University of Tehran.

Introduction

The ever increasing amount of information, the rapid expansion of the internet, the production of various types of information formats, the emergence and development of multimedia, and the tendency of the researchers in access to electronic information formats have changed the role and function of libraries in today's world, so that currently, the internet is the most extensive and up-to-date source of information and its popularity continues to increase (Aminpour, 2006). Accordingly, given the main mission of libraries to meet the information needs of users, today new models for library design are considered, among which digital libraries have a special place in the virtual environment of the Internet. But the digital library with all the features and benefits, still has a vague concept. Digital Libraries

Federation (DLF) provided a definition of digital libraries in 1998, which is one of the most prominent definitions of digital library: "Digital libraries are organizations whose resources include expert staff for selecting, structuring, accessing intellectual resources, interpreting, maintaining the integrity, and sustainability of digital collections. This is thus so that these resources are available for specific communities or a set of communities" (NadiRavandi & Hajizeynolabedini, 2009).

For a sustainable development and greater success, digital libraries need to be evaluated at different times. Hence, we need evaluation to achieve dynamic and efficient digital libraries at different stages of planning, design, implementation and development. The assessment provides the possibility of accurate identification and better awareness of the processes and functions and allows for appropriate and timely decision-making (Norouzi, 2004). Although Saracevic (2004) says, digital library evaluation is not impossible, but doing so is a very difficult task. Similarly, Borgman et al. (2004) argue that digital evaluation is difficult due to complexity, types, applications and users. In their study of digital issues and trends, Chowdhury & Chowdhury (2003) conclude that a new set of parameters are needed for evaluating digital libraries to illustrate these different needs. Usability study is a type of digital library evaluation. Most research on the evaluation of digital library have focused on usability studies. Despite the existence of a variety of digital libraries in Iran, including academic, specialized and other types, there has been little evaluation work on this, which is due to the newness in this field. In Iran, some research has been conducted on the feasibility of digital libraries (Fadaei & Noshin Fard, 2009; Mohammadesmaeil & Rahiminezhad, 2010), but despite the importance of digital evaluation, documentary research in this regard is not mentioned in resources and references. Therefore, it is necessary that Iranian digital libraries be assessed as being applicable as a result of the importance of evaluation. According to the above argument, the present study focuses on evaluation of the usability of digital libraries in public universities in Tehran. It should be noted that the researches carried out in this area, some of which are worthy of mention here. It should be noted that the researches carried out in this field, here are some of them.

In Hariri & Norouzi (2010), due to the lack of specific criteria for evaluating the user interface of the digital interface, an extensive exploration of the text and related resources was carried out and identification and determination of these criteria were dealt with. In this research, after conducting research on important webs and databases, resources related to this field were identified and divided into 43 sources. These resources were categorized in three categories of user and digital libraries, digital libraries and usability according to the content, and other studies related to the user interface. Finally, after analyzing the selected matrix content in relation to the criteria and their authors, the criteria were determined based on the number of repetitions in the studied texts and suggested for the user evaluation of the interface of digital libraries.

In Norouzi (2010) for analyzing the user interface of Persian digital libraries in Iran's digital libraries using Delphi method, 10 criteria (search, coherence, guidance, design, error correction, information display, user control, interface language and simplicity) were selected along with 114 components for evaluation. The study population included 11 Iranian digital libraries. The results of the research showed that, in total, among the studied criteria, interface language and error correction criteria, with the average score of 95.58 and 36.99 from the total points obtained by the digital libraries studied, respectively, were the highest and lowest

points. In another study, Nokarizi & Abedini (2012) showed that the application of usability dimensions on the website of the central libraries of the Ministry of Science, Research and Technology (MSRT) universities was in a good standing (from 60 to 80) to the users. The smallest content and user interface design got the highest score. There was a significant difference between the mean scores of users' judgment regarding the application of usability dimensions with the desired status (80%). There was a significant difference between the judgments of users of different educational levels, users with a history of different use of computers and the internet, and users with a different use period of the central Library website, on the application of usability dimensions on the website of the central libraries. However, there was no significant difference between the judgments of male and female users and users of different age groups.

Alasem (2014) expressed with the rapid expansion of the use of web-based resources for education purposes, the usability of a digital library needs to be considered as an important element in the achievement of the full potential of any digital library (DL) project. Based on related studies, a set of sixteen items covering four axes: i.e. efficiency, effectiveness, aesthetic appearance and learnability were developed to evaluate the interface of the Saudi Digital Library (SDL). The main finding of the study indicated that the level of usability of SDL's interface was not acceptable, in particular in terms of aesthetic appearance. Moreover, it appears that problems facing other internet applications in Saudi Arabia will continue to influence the development of digital library projects. In a study entitled "digital library evaluation through multiple measurements" Lamount (2014) showed that evaluating services and a selection set for digitization could demonstrate project access as a digital library value and, upon request future budget. While digital libraries are often evaluated based on usability, users are rarely asked about the value or usefulness of digital library content. The valuable or useful collections will attract additional users, and will help make informed decisions in future projects. In this research, the digital library of archive material of an educational institution was used as a case study. The purpose of this research was to determine how users are questioning the utility and value of collections in a digital library. The combination of qualitative and quantitative data was analyzed, in which multiple dimensions and data points can lead to applied and comprehensive results. Research has led to special suggestions for improving this digital library and the results for other digital libraries. Alipour-Hafezi and Amanollahi Nick (2015) with purpose to identify the situation of evaluating Iranian digital libraries using Digi QUAL protocol, showed that Digital Library of Isfahan Science and Technology Town has the best performance and Noor Digital Library has the lowest operation in studied digital libraries. The overall score of all studied digital libraries was under 60 (out of 100) which shows the average performance of the digital libraries. In a research Sánchez-Gálvez and Fernández-Luna (2015), usability evaluation methodology of digital libraries is proposed; specifically for the web site of academic digital libraries. The methodology offers a evaluation instrument that collects the users' perceptions through four dimensions (effectiveness, efficiency, satisfaction and learnability). In addition, the gap theory of quality service is employed and a fuzzy linguistic approach using aggregation operators, which operate directly with words (linguistic information) is applied. Therefore, the methodology shows to be a significant, innovative contribution to the research area on usability evaluation of digital libraries. It can be useful for both an academic library web site and an operational digital library. Bartalesi, Meghini, Metilli, & Andriani (2016) present Dante Sources, a

Digital Library of Dante Alighieri's primary sources, i.e. the works of other authors that Dante cites in his texts. Currently, this information is scattered in many books, making it difficult for the scholars to retrieve it and also to produce a systematical overview of the cultural background of Dante. In order to overcome this problem, an ontology expressed in Resource Description Framework/ Schema(RDF/S) was developed to represent this knowledge. Once the ontology had been defined, they populated it with the data included in authoritative commentaries to Dante's works. They stored the resulting RDF graph into a Virtuoso triple store. Finally, on top of this graph, they developed Dante Sources, which allows users to extract and display the knowledge stored in the knowledge base in the form of charts and tables. In thepaper they present the results of a survey to collect suggestions and comments from end-users on their interactions with Dante Sources in order to evaluate its usability.

From the research backgrounds, it can be concluded that the focus of majority of most digital library research is on usability, with most of the literature and resources studied in the field of digital library and usability in the areas of evaluation, design, users, review of the criteria and their related factors. By defining the usability of the system as a principle, and applying observation and measurement, it is to some extent the basis for creating and maintaining information systems in order to achieve satisfaction, efficiency, usefulness and support for those who use these systems. The general objectives of this research are to determine the status of usability and to examine the difference in its status in the digital libraries of the studied population from the users' perspective. Subsequent sub-goals are criteria search, navigation, forms layout, contrast and scan ability, optimization, help, usage of windows, speed and errors of the digital libraries of the studied population from the users' perspective.

Research Question

What are the statuses of the digital libraries from the users' perspective regarding the indicators of search, navigation, forms layout, contrast and scan ability, optimization, help, usage of windows, speed and errors?

Research hypotheses

1. Less than 50% of population of the study used the usability criterion in the provision of digital libraries.
2. There is a significant difference between the digital libraries in terms of usability criterion.

Research method

This is a descriptive research conducted in a survey method. In this research, we used a questionnaire which consists of two parts: 6 questions related to the personal profile and 36 questions related to the specific criteria of usability containing 8 indicators of search, navigation, forms layout, contrast and scan ability, optimization, help, usage of windows, speed and errors. In this questionnaire, we used Likert scale for scoring five levels of fully agree, agree, no idea, disagree, and totally disagree. Students from three undergraduate, postgraduate and Ph.D. levels from University of Tehran, Amirkabir University of Technology and Sharif University of Technology were considered as the population of the

study. In this research, stratified random sampling was used and the sample size was calculated from the Morgan and Krejcie estimation table. According to this table, a sample of 378 people including 130 from University of Tehran, 125 from Amirkabir University of Technology and 123 from Sharif University of Technology have been selected as digital library users from the 124800 population. Content validity was used to assess the validity of the questionnaire. After preparing the questionnaire, it was submitted to three experts of this field for confirmation of the content. After the comments were made, general amendments were considered. To assess the reliability of the questionnaire, a pre-test was given to ten percent of users similar to the sample. The questionnaire was completed by 38 users and then Cronbach's Alpha test was used to measure its reliability. After entering the data, Cronbach's Alpha coefficient was 0.80 representing an acceptable reliability of the questionnaire. To analyze the data, binomial, t-test and one-way ANOVA were used at the significance level of 0.05.

Research findings

The following results were obtained to answer the research questions and hypotheses:

Table 1

Status of the digital libraries of the studied population in the criteria

Criteria	Universities	Average	Standard Deviation (SD)
Search	Amirkabir	2.62	0.45
	Tehran	2.58	0.52
	Sharif	2.52	0.37
Navigation	Amirkabir	2.56	0.32
	Tehran	2.52	0.37
	Sharif	2.52	0.27
Forms Layout	Amirkabir	2.56	0.60
	Tehran	2.56	0.57
	Sharif	2.50	0.51
Contrast and Scanability	Amirkabir	2.62	0.60
	Tehran	2.57	0.51
	Sharif	2.53	0.35
Optimization	Amirkabir	2.74	0.56
	Tehran	2.67	0.56
	Sharif	2.59	0.47
Help	Amirkabir	2.66	0.46
	Tehran	2.63	0.57
	Sharif	2.54	0.36
Usage of Windows	Amirkabir	2.58	0.42
	Tehran	2.54	0.32
	Sharif	2.52	0.50
Speed and Errors	Amirkabir	2.55	0.42
	Tehran	2.48	0.32
	Sharif	2.42	0.50

1. What is the status of the digital libraries of the studied population in the indicator of search from the users' perspective?

As the statistics in Table 1 show, the indicator of Search in the digital library of Amirkabir University is 2.62 and the standard deviation is 0.45, and in the digital library of Sharif University mean is 2.52 and standard deviation 0.37, which is the lowest mean. This difference is due to the components of the search criteria for Amirkabir University of digital library, which allows users to easily search all sorts of documents based on their type of document, and for this reason, users feel more satisfied compared to other digital libraries. It can also be seen that the subjective status of the search in the digital libraries studied is lower than the expected mean of the measurement scale (3), which indicates that the digital libraries of the three studied universities could not get the average score in search indicator.

2. What is the status of the digital libraries of the studied population in the indicator of navigation from the users' perspective?

As Table 1 shows the indicator of navigation in the digital library of Amirkabir University has a mean of 2.56 and standard deviation of 0.22 as the highest, and the digital libraries of Tehran and Sharif universities have, respectively, the average of 2.52 and the standard deviations of 0.37 and 0.27 and ranked second and third in terms of average value. Therefore, the lowest average value belongs to Sharif University. The indicator navigation can be one of the most important factors for a digital library that the user can easily use. The components related to navigation indicator show the importance that somewhat satisfied users of the digital library of Amirkabir University with regard to the digital libraries compared to other two universities. However, the highest average was for Amirkabir University (2.56) is lower than the expected average of the measurement scale (3), which indicates that none of the digital libraries of the three universities studied was able to obtain an average grade in navigation indicator.

3. What is the status of the digital libraries of the studied population in the indicator of forms layout from the users' perspective?

As table 1 shows the indicator of forms layout in the digital library of the universities of Tehran and Amirkabir University, respectively, had an equal average of 2.62 and the standard deviations of 0.57 and 0.65, respectively, which was the highest score. In the digital library of Sharif University the average was 2.50 and standard deviation was 0.51 that was the lowest average value. In the components related to forms layout, somewhat similarity of these components can be seen in digital libraries of the universities of Tehran and Amirkabir University whose users had a fairly similar idea. However, the highest mean for forms layout (2.56) was lower than the expected average of the measurement scale (3), which shows that none of the digital libraries in the three studied universities has been able to get the average score.

4. What is the status of the digital libraries of the studied population in the indicator of contrast and scan ability from the users' perspective?

As Table 1 shows the indicator of contrast and scanability in the digital library of Tehran University had a mean of 2.62 and a standard deviation of 0.60 as the highest and in the digital library of Sharif University with a mean of 2.53 and SD of 0.35 minimum mean values. This difference exists at three different levels, which can be due to components of the criteria for contrast and scan ability that vary in three different digital libraries, making their

users somewhat different. However, the highest mean for the indicator of contrast and scan ability was in the digital library of Tehran University that is lower than the expected mean of the measurement scale (3), i.e. none of the digital libraries of the three universities studied got an acceptable average score in the indicator of contrast and scanability.

5. What is the status of the digital libraries of the studied population in the indicator of optimization from the users' perspective?

As Table 1 shows the indicator of optimization in the digital library of Sharif University with an average of 2.74 and standard deviation of 0.56 is greatest and in the digital library of Tehran University with a mean of 2.59 and a standard deviation of 0.47 is the lowest average value. Among the usability criteria for the digital libraries of the population under study, the indicator of optimization has the highest mean. Components related to the indicator of optimization can be important in terms of content for the digital library so that the user can easily access it. However, the averages obtained in the indicator of optimization for the digital libraries of the studied population is lower than the expected average of the measurement scale (3), which indicates that none of the digital libraries studied has been able to get the average score.

6. What is the status of the digital libraries of the studied population in the indicator of help from the users' perspective?

As Table 1 shows the indicator help in the digital library of Amirkabir University with mean 2.66 and standard deviation of 0.46 was the highest and in the digital library of Sharif University with a mean of 2.54 and standard deviation 0.36 was the lowest average value. The indicator help is among the usability criteria of the factors of the principle of digital libraries that the user can use for permanent use for easy use. The components related to the indicator help will show this property as a whole, which can be used by the user in the entire digital library and guided it step-by-step. However, the highest average for the digital library of Amirkabir University in the indicator help is lower than the expected average of the measurement scale (3) i.e. in the indicator help, none of the digital libraries of the studied population has been able to obtain the average score.

7. What is the status of the digital libraries of the studied population in the indicator of usage of windows from the users' perspective?

As Table 1shows the indicator of usage of windows in the digital library of Amirkabir University with a mean of 2.58 and standard deviation of 0.42 was the highest and in the digital library of Tehran University with a mean of 2.52 and standard deviation of 0.50 had the lowest average value. The components related to usage of windows can illustrate the application of this indicator in all digital libraries that users are dealing with at the stage of application that can be used to guide them. Although the highest average for the indicator of usage of windows was for the digital library of Amirkabir University, the average was lower than the expected scale of measurement (3), which means that in the indicator of usage of windows none of the library has digital college of the three universities did not have the average score.

8. What is the status of the digital libraries of the studied population in the indicator of speed and errors from the users' perspective?

As Table 1 shows the indicator of speed and errors in digital library of Tehran University with a mean of 2.55 and a standard deviation of 0.62 was the highest, and the lowest average was in the digital library of Sharif University with a mean of 2.42 and standard deviation of

0.39. The indicator of speed and error among the other usability criteria has the lowest average. Considering the related to this criterion, we can see the weakness of this criterion in digital libraries, where the users do not feel satisfied to some extent. However, although the highest average for the indicator of speed and error belonged to the University of Tehran, but it is lower than the expected average of the measurement scale (3), which shows none of the digital libraries of the three studied universities has been able to achieve an average score.

Testing research hypotheses

Hypothesis 1: Less than 50% of the statistical population used the usability criterion in the provision of digital libraries.

Table 2
Results of the test of normal distribution of data of research variables

Variable	Search	Navigation	Forms Layout	Contrast &Scanability	Optimization	Help	Usage of Window	Speed and Error
significance level	0.38	0.45	0.34	0.21	0.37	0.52	0.48	0.23

Based on the findings, the result of the Kolmogorov-Smirnov test showed that the data distribution was normal in the research variables, therefore, we used parametric tests (Table 2).

Table3
Compare the average population of the study on the usage of the usability criterion in the provision of digital libraries

Criteria	Gender	Sample Size	Average	Standard Deviation
Search	Male Female	217 161	2.58 2.57	0.45 0.45
Navigation	Male Female	217 161	2.49 2.58	0.35 0.38
Forms Layout	Male Female	217 161	2.51 2.58	0.53 0.55
Contrast and Scanability	Male Female	217 161	2.56 2.58	0.51 0.49
Optimization	Male Female	217 161	2.68 2.65	0.57 0.48
Help	Male Female	217 161	2.61 2.61	0.46 0.50
Usage of Windows	Male Female	217 161	2.49 2.67	0.42 0.41
Speed and Errors	Male Female	217 161	2.47 2.50	0.46 0.51

Table 4
The usability criterion in the provision of digital libraries

Criteria	Average	Standard Deviation	Percent	Significance level
Usability	0.57	0.5	%43	0.006

α= 0.05

Statistical data on the extent to which the statistical population of the study has made the usability criterion for the provision of digital libraries is shown in Tables 3 and 4. To answer the first hypothesis, a binary test has been used as the gender factor (male and female) has been used as the statistical population of research in the application of the usability criterion for digital libraries. Thus, the null hypothesis (H_0) is defined as more than 50% of the statistical population has used the usability criterion in the provision of digital libraries, and the opposite hypothesis (H_1), less than 50% of the statistical population have used the usability criterion in the provision of digital libraries. As the data in Table 4 indicates, the value of p is related to applying the usability criterion in digital libraries equal to 0.006, which is less than 0.05. Therefore, our null hypothesis is rejected and it is concluded that less than 50% of the statistical population of the study applied the usability criterion at the confidence level of 0.95, which is the provision of digital libraries.

Hypothesis 2: There is a significant difference between the digital libraries of the statistical population in terms of usability criteria.

Table 5
Evaluation significant difference in terms of usability criteria between the digital libraries of the statistical population

Criteria	Digital libraries	Average Difference	Significance level
Search	Tehran Amirkabir	-0.043	0.44
	Sharif	0.057	0.32
	Amirkabir Tehran	0.043	0.44
	Sharif	0.101	0.08
	Sharif Tehran	-0.057	0.32
	Amirkabir	-0.101	0.08
Navigation	Tehran Amirkabir	-0.035	0.44
	Sharif	-0.008	0.86
	Amirkabir Tehran	0.035	0.44
	Sharif	0.027	0.56
	Sharif Tehran	0.008	0.86
	Amirkabir	-0.027	0.56
Forms Layout	Tehran Amirkabir	0.003	0.96
	Sharif	0.062	0.38
	Amirkabir Tehran	-0.003	0.96
	Sharif	0.058	0.41
	Sharif Tehran	-0.062	0.38
	Amirkabir	-0.058	0.41
Contrast andScanability	Tehran Amirkabir	0.050	0.42
	Sharif	0.088	0.16

Criteria	Digital libraries	Average Difference	Significance level
	Amirkabir Tehran	-0.050	0.42
	Sharif	0.038	0.54
	Sharif Tehran	-0.088	0.16
	Amirkabir	-0.038	0.54
Optimization	Tehran Amirkabir	-0.080	0.22
	Sharif	-0.148	0.02
	Amirkabir Tehran	0.080	0.22
	Sharif	-0.068	0.31
	Sharif Tehran	0.148	0.02
	Amirkabir	0.068	0.31
Help	Tehran Amirkabir	-0.038	0.52
	Sharif	0.090	0.13
	Amirkabir Tehran	0.038	0.52
	Sharif	0.128	0.03
	Sharif Tehran	-0.090	0.13
	Amirkabir	-0.128	0.03
Usage of Windows	Tehran Amirkabir	-0.059	0.26
	Sharif	0.001	0.98
	Amirkabir Tehran	0.059	0.26
	Sharif	0.060	0.26
	Sharif Tehran	-0.010	0.98
	Amirkabir	-0.060	0.26
Speed and Errors	Tehran Amirkabir	0.069	0.25
	Sharif	0.126	0.04
	Amirkabir Tehran	-0.069	0.25
	Sharif	0.057	0.35
	Sharif Tehran	0.126	0.04
	Amirkabir	-0.057	0.35

$\alpha = 0.05$

The statistical data related to the study of differences in terms of usability criteria among digital libraries of Tehran's governmental universities are presented in table 5. To answer the second hypothesis, one-way analysis of variance (ANOVA) was used in which the null hypothesis(H_0) between digital libraries of the statistical population of the research is not significantly different and the opposite hypothesis (H_1) between digital libraries of population the statistical significance of the research is significant. As the data in Table 5 indicates, the value of p in terms of criteria (search, navigation, forms layout, contrast and scan ability, optimization, help, usage of window, speed, and error) for the usability of digital library holdings in Tehran's governmental universities is greater than 0.05 showing no significant difference in the reliability at 0.95 level of confidence according to these usability criteria in digital libraries. However, the value of p in terms of criteria (optimization, help, speed and error) of usability in the digital library of the studied population between Sharif –Tehran (0.02), Amirkabir-Sharif (0.03), Tehran-Sharif (0.04) and Sharif-Tehran (0.04) are less than 0.05, there is a significant difference at the confidence level of 0.95. Nevertheless, in the

whole usability criterion, it can be concluded that the null hypothesis is confirmed and there is no significant difference between the digital libraries of the population under study.

Discussion and Conclusion

We found no study in Iran regarding our subject matter. The general objectives of this research are to determine the status of usability and to examine the difference in its status in the digital libraries of the studied population from the users' perspective. Subsequent sub-goals are criteria search, navigation, forms layout, contrast and scan ability, optimization, help, usage of windows, speed and error of the digital libraries of the studied population from the users' perspective. According to the findings of the research, among the usability criteria for assessing the status of digital libraries in Tehran's governmental universities as well as the observed mean, there was not much difference between them. However, in reviewing the status of the sub criteria, one can say that among the criteria of usability, optimization criteria and speed and error, respectively, have the highest and lowest mean respectively. However, due to the little difference between the criteria, we cannot generally say that there is a significant difference between them. The findings of this study are partly consistent with the findings of the text-based study papers, which are referred to below. In the studies of Hariri, Norouzi (2010), Norouzi (2010) and Alasme (2014) the evaluation of user interface criteria and usability category and its impact on digital library research has been pointed out, indicating its importance in its studies. According to this research, usability criteria have an important role in evaluating digital library. Considering the findings of the research on Nokarizi & Abedini (2012) and Sánchez-Gálvez and Fernández-Luna (2015) the research methodology and usability of the dimensions of the digital library evaluation, it can be used in other environments such as university libraries websites, which is worthwhile. In this regard, the results of this study are also evaluated for the usability of university digital libraries. Also, Lamont (2014) demonstrated in the evaluation of a usability-based digital library that is valuable in the collection and formation of a digital library, which is what we in the present study aimed at evaluating usability criteria, offering better services for users. The results of Bartalesi et al 's research showed (2016) that collecting suggestions and comments from end users in interaction with the digital library to evaluate usability. Therefore, the present study is aimed at evaluating the usability criteria of digital library.

Digital libraries are different in terms of content, size, and type of facilities they offer. Identifying evaluation criteria is essential for the development of comprehensive frameworks and conducting evaluation of digital libraries. Nevertheless, since all of these libraries have specific goals and responsibilities for providing information services, the evaluation of digital libraries is essential for proper communication with users. A digital library naturally covers a wide range of users. Therefore, in order to meet their information needs, they need to provide a wide range of services tailored to the needs of users. Over the past few years, discussions have focused on evaluating usability and attracted the attention of researchers from various fields, including librarians. Various literature and references have identified definitions and concepts for these steps and levels of digital library assessment, and have understood the concept of usability based on the theory of human-computer interaction that they have defined the degree of satisfaction, efficiency, and efficiency to achieve a specific goal in a particular environment. One of the features of a useful and efficient digital library is the degree to which digital library is usable, which can have a positive impact on the delivery of services through

a digital library. The usability in a digital library can influence the user's behavior through effective use and more use of the services available in the digital library, and the lack of attention to the digital library's usability reduces the system's returns to users' dissatisfaction. In addition, in order to increase user usability, not only should the system be able to help users find useful information sources, but also should increase user interaction with the system as well as user interaction with other users. This is because in addition to the content of the collection, the interaction of users with each other can also be a good source for promoting knowledge. Therefore, when designing models for evaluating a digital library, this should be taken into consideration.

Considering the results of this study and the existence of components related to usability criteria, we observe that digital libraries of state universities of Tehran need to review and improve the quality of these components, despite the basic criteria for these digital and efficient libraries for easy user use. It is necessary to pay attention to the level of quality improvement in relation to other criteria. Digital library managers and developers should endeavor to provide services in their digital library continuously that addresses the needs of the audience of different age groups, levels, and experiences, and increases the satisfaction of users of the digital library's services. Considering the usability in designing a digital library makes it more desirable for the user to visit the digital library frequently and to achieve the goals of the parent organization. Therefore, it is the duties of managers, librarians and digital library specialists, who are well aware of these issues. In the IT era, all universities and higher education institutions should provide these facilities to the users of digital libraries of the universities in professional and efficient levels.

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