

# Evaluation of Web Pages of Central Libraries of Iranian Public Universities via Integration of WEBQUAL Model, Information Potential Gap Theory and Gap Theory: a Conceptual Model

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## ABSTRACT

The present research evaluates websites of central libraries of Iranian Public universities in terms of dimensions, constructs and items of WEBQUAL and presents a model in this field. WEBQUAL is an instrument which is used for measuring users' perception of websites service quality and includes 4 dimensions, 12 constructs and 35 items. Respondents are asked to evaluate each item (question) in a 7-point Likert scale. In the present research, a survey was conducted by means of questionnaires on 13 libraries of Public universities in Iran which had been registered in the list of libraries and documents centers of Iranian Research Organization of science and technology (<http://library.irost.ir>) before January 2006. Results showed that the highest point belongs to "trust" construct and the lowest point belongs to "response time" construct in "usefulness" dimension in all 13 libraries. The greatest potential gap from (7) was (3.97) which belonged to total mean of the constructs of "entertainment" dimension in central library website of Tabriz University and the lowest potential gap (0.3) belonged to total mean of the constructs of "ease of use" dimension in central library website of Amir Kabir University. In general, considering the dimensions and constructs of WEBQUAL, the greatest score belonged to central library website of Amir Kabir University and the lowest score belonged to central library website of Tabriz University.

**KEYWORDS:** webpages quality, WEBQUAL, information potential gap, gap analysis, websites of central libraries of Iranian Public Universities, conceptual model.

## INTRODUCTION

Information has a lot of values regardless of the platform it lies on and result in creation of wisdom. Internet is an information instrument and its boundaries are beyond geographical, political and temporal borders. World Wide Web has eliminated distances among different nations and countries and has transformed traditional methods of information collection, storage, evaluation and distribution and has improved the level of cultural and social transactions across the world. World Wide Web is the most comprehensive information platform due to not involving waste of time and cost, ease of access and information updating. Many scientific and research organizations like university libraries have had a lot of effects on information activities. Many universities libraries design websites for individuals' ease of access to references (Stover, 1997). Some libraries also provide access to other reference centers like public schools and profit-making or non-profit-making organizations (Chao, 2001).

University libraries websites have common goals in providing information for users although their service qualities may be different. Therefore, university libraries managers should use "user-oriented" instruments and models for measuring websites service quality in order to become aware of the level of users' expectations and perceptions. Many information institutes like university libraries try to develop and create "user-friendly" websites in order to make information more accessible. However, it seems that many websites are not able to provide a clear image of the accessible facilities, references and service because they do not consider the basics of information organizations and websites service quality instruments (RezaeeSharifabadi, Foroudi, 2002).

### Statement of the problem

Most librarians believe that "library is a service organization" and serving users is one of the strengths of libraries. Libraries should re-design their service-providing methods, duties, and plans due to vast changes in all areas (Weingand, 1997) in order to be able to compete in information global market and make much of investments.

Furthermore, librarians have always tried to increase useful relationship between users and websites. Therefore, it is necessary for libraries managers to perceive users' expectations of library websites considering

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the effective role of university libraries websites in promotion of users' scientific, educational and information level.

Therefore, an appropriate method for evaluation of service qualities is one which is based on feedbacks or, in other words, users' viewpoints (Hernon and Altman, 1996). Martin believes that in order to evaluate universities libraries websites service, the best motivation for investigation of users' ideas is that libraries are service institutes and high-quality service is provided when users' needs are recognized. Goldhor believes that investigation of users' ideas provides criteria on received service. On the other hand, serving customers is not a temporary matter and requires qualitative and quantitative stability. Thus, concentration on users and attempts for removing their expectations and making libraries customer-oriented is the most important method for increasing libraries flexibility.

In the present research, websites services of central libraries of Iranian Public universities were evaluated by means of WEBQUAL approach and based on the constructs of the aforementioned instrument and the flaws of performance quality of these universities central libraries were analyzed and some solutions were suggested to improve the present service quality and a model was proposed for effective design of websites. In the end of this research, we will be able to formulate criteria for evaluation of service quality in the websites of university libraries.

### **1-3. operational definition of research constructs**

**Webpage:** it is a text file comprised of one main page and pages which are linked to it which are designed and supported by organizations or individuals and belong to a special individual or organization and is called website in the present research.

**Evaluation criteria:** in the present research, by evaluation criteria, we mean the collection of items which are used for measuring different constructs of WEBQUAL constructs. WEBQUAL was used as an instrument for measuring service quality in the websites of central libraries of Iranian public universities.

**Public university:** it refers to a university which is covered and governed by Ministry of Science, Research and Technology and its name had been registered in the list of libraries and documents centers of Iranian Research Organization of science and technology (<http://library.irost.ir>) before January 2006..

**Central library:** in the present research, central library refers to a library whose name had been registered in the list of libraries and documents centers of Iranian Research Organization of science and technology (<http://library.irost.ir>) before January 2006.as central library.

**Users:** users of universities central libraries websites refer to faculty members of universities who use websites of central libraries of their universities.

### **1-4. basic questions:**

- What is the level of usefulness of websites of central libraries of Iranian Pubic universities from users' viewpoints?
- To what level do websites of central libraries of Iranian Public universities provide ease of use for users?
- What is the level of entertainment of the websites of libraries of Iranian public universities from users' viewpoints?
- To what level do websites of central libraries of Iranian public universities establish friendly relationship between users and organizational information?
- How do users evaluate websites of central libraries of Iranian public universities in general?

### **1-5. research goal and contribution**

**Goal:** the main goal of the present research is to evaluate websites of central libraries of Iranian public universities using websites service quality measurement approach-WEBQUAL-and investigate users' responses to websites service.

Investigation of the usefulness, ease of use, entertainment and friendly relationships of the mentioned websites from users' viewpoints are also subsidiary goals of this research.

**Contribution:** using the results of the present study, library website designers will be able to learn about their website designing strengths and weak points and users' response to websites services for designing websites optimally.

### **1-6. research basic variables**

**Independent variable:** items of constructs of WEBQUAL dimensions

**Dependent variable:** the present conditions of the websites of central libraries of Iranian Public universities

### **1-7. research methodology**

The present research is a survey study in which data were collected by means of questionnaire. In order to measure service quality of websites of central libraries of Iranian public universities, 13 websites which were

registered in the list of libraries and documents centers of Iranian Research Organization of science and technology (<http://library.irost.ir>) before January 2006. were identified and evaluated. These websites include: websites of central libraries of Tehran University, Tabriz University, TarbiyatModarres University, tarbiyatMoallem University, Mashhad Ferdosi University, Ahwaz SjahidChamran University, Mazandaran University, ShahidBeheshti University, Isfahan Industrial University, Sharif University of Technology, and AmirKabir University of technology, Iran Science and Technology University, and KhajehNasir-al-Din University of Technology. Then, a questionnaire which was made up of 4 dimensions, 12 constructs and 35 items was distributed among faculty members of the mentioned universities.

The present research evaluated service quality of each construct on a 7-point Likert scale (from completely disagree to completely agree) from users' viewpoints. Faculty members of the mentioned universities were 650 in number and 50 people were selected from each university by means of simple random sampling. The questionnaires were sent to users via express mail and in some cases, users' were directly asked to fill out the questionnaires. The questionnaire which was used in this research was extracted from valid scientific references in 2005 and adjusted. It was used as follows:

Since "importance" is a relative concept, +4 (mean value) to +7 was considered as relative importance range and real performance was in the range 1-7. Therefore, respondents' ideas about real performance of the items and constructs of the websites and their distances to the highest favorable level were measured without asking users about the performance and importance of the subject artificially. Then, the gap between what was there and what could be there was measured. In fact, WEBQUAL model, gap theory and potential gap method were combined in this research for analysis.

## RESEARCH LITERATURE REVIEW

In 2001, Stuart J. Barnes and Richard T. Vidgen conducted a research and evaluated the qualities of services provided by three auction websites: Amazon, E-bay and QXL using WEBQUAL approach in the 34<sup>th</sup> international conference on scientific systems. Quantitative analysis of the results showed that Amazon website had the first rank in service quality from users' viewpoints and E-bay and QXL had the second and third ranks, respectively and with considerable distances. The main items of Amazon website attractiveness included presence of homogeneous commercial signs and images in the website, ease of online transactions, high security conditions in online transactions and reception of ordered goods and items, high speed of transaction, users' asking and answering questions, and website visual attractiveness. The main reasons for dissatisfaction of users with QXL performance included: difficulty in establishment of transaction with users, low security regarding users' personal information and online transactions and reception of ordered articles, difficulty in online transactions and low speed of ask/answer transactions. They also conducted a research in 2003 and evaluated the quality of developing commercial websites in England and Newslan using WEBQUAL instrument. Results showed that the most important variables from users' viewpoints included: "ease of understanding", "information suitable for tasks", "information security" and "trust in website", ease of learning and operation, ease of establishment of relationship with organization via website, "sense of empathy" with website and "visual attractiveness" of website.

Eleanor T. Loiacono, Richard T. Watson, and Dale L. Goodhue (2005) conducted a research titled: "WEBQUAL: a scale for evaluation of website quality" and dealt with the process of validity and development of scales of evaluation of websites. They selected two populations (one included 510 users and the other included 336 users) and evaluated a sample website from their viewpoints. Then, they selected another population including 311 users in order to verify the correctness and comprehensiveness of the dimensions of the instrument and evaluated the sample website from their viewpoints. In the end, the mentioned research designed a WEBQUAL questionnaire which included 4 dimensions, 12 constructs and 35 items for measurement of websites quality. The present research also used this very instrument for evaluation.

## RESULTS ANALYSIS

In evaluation of websites quality using WEBQUAL, respondents are asked to assign a score to items of website quality on a 7-point Likert scale from completely agree to completely disagree. Then, gap theory is used to measure the difference between perceived quality and expected quality levels by users. In the present research, number "7" was considered as "very favorable condition" and as reference point in order to determine information potential of each of the items of WEBQUAL instrument. Then, potential gap of each item was measured with respect to 7. Potential gap of each "effect" with respect to reference point was called potential of that effect. Thus, in order to calculate information potential between two "effects" of A and B, we can calculate VA and VB separately and then calculate VB-VA subtraction. We can recognize negative events (barriers) against information transfer using information analysis method (Horri, 2002) and make real condition closer to favorable condition by means of eliminating the barriers. This is because there is a correlation between value of

each stage of information potential gap and negative events (barriers) which are against information transfer of an object of phenomenon space (Horri, 2004).

In order to analyze data, first we calculated mean value of the seven values of the questionnaires:

$$\frac{7+6+5+4+3+2+1}{7}=4$$

Value "4" which is in fact mean of the range "very unfavorable" to "very favorable" was set as the base of measuring users' evaluation of websites and values were compared with this mean index. Naturally, values which were lower than 4 were regarded as negative and values greater than 4 were regarded as positive. Of course, favorability and non-favorability range varies with being close or away from very favorable value (i.e. 7) and this indicates values elasticity towards 1 or 7. In the end, each item's mean value was calculated and then, the present conditions of the constructs of each dimension ("usefulness", ease of use", "entertainment", and "friendly relationships") were analyzed for websites. A separate table was designed for each dimension which summarized information on the conditions of the constructs of that dimension and potential gap of each of them with respect to very favorable condition (7) in the 13 websites.

Table 1.conditions of the constructs of usefulness dimension for websites of central libraries of Iranian Public universities

row	usefulness universities	Information suitable for tasks	Appropriate relationships	trust	Response time	Total mean	Potential gap (with respect to 7)
	Tabriz University	4/28	4/4	5/62	2/46	4/19	2/81
	TarbiyatModarres University	5/61	5/96	6/01	4/39	5/49	1/51
	TarbiyatMoallem University	5/37	5/26	5/41	3/44	4/87	2/13
	Tehran University	5/26	5/70	5/92	3/07	4/98	2/02
	ShahidBeheshti University	5/94	5/93	5/98	3/7	5/38	1/62
	Ahwaz ShahidChamran University	5/38	5/98	6/35	3/62	5/33	1/67
	Isfahan University of Technology	4/56	6/76	6/63	4/08	5/50	1/50
	Amir Kabir University	6/03	6/28	6/02	5/47	5/95	1/05
	KhajehNasiroddinTousi University of Technology	4/32	4/92	5/70	4/12	5/76	2/24
	Sharif University of Technology	4/46	5/81	5/61	4/7	5/14	1/86
	Science and Technology University	5/62	6/64	6/57	2/85	5/42	1/58
	Mashhad Ferdosi University	5/68	6/26	6/01	4/51	5/60	1/40
	Mazandaran University	5/76	6/10	6/22	3/86	5/48	1/52
	Total mean	5/25	5/84	6	3/86	5/23	1/77

As it can be seen in table 1, there are significant differences among universities in the four constructs of "usefulness". The construct "information suitable for tasks" has a mean value equal to 5.25 and "trust" construct has a mean value equal to 6 which is the greatest share in favorability in all universities. Potential gap between "usefulness" dimension real value and very favorable condition is equal to 1.77 for all universities and the main barrier against access to favorability is "response time".

Table 2.conditions of the constructs of ease of use dimension for websites of central libraries of Iranian Public universities

row	Ease of use universities	Ease of understanding	Internal performance	Total mean	Potential gap (with respect to 7)
	Tabriz University	5/28	5/29	5/28	1/72
	TarbiyatModarres University	5/52	6/42	5/97	1/03
	TarbiyatMoallem University	5/17	5/18	5/17	1/83
	Tehran University	4/9	6/12	5/51	1/49
	ShahidBeheshti University	5/52	5/47	5/49	1/51
	Ahwaz ShahidChamran University	5/48	6/09	5/78	1/22
	Isfahan University of Technology	5/86	6/79	6/32	0/68
	Amir Kabir University	6/63	6/78	6/70	0/3
	KhajehNasiroddinTousi University of Technology	5/62	5/72	5/67	1/33
	Sharif University of Technology	5/42	5/64	5/53	1/47
	Science and Technology University	5/9	6/72	6/31	0/69
	Mashhad Ferdosi University	5/59	5/61	5/6	1/4
	Mazandaran University	5/38	5/91	5/64	1/36
	Total mean	5/55	5/98	5/76	1/24

As it can be seen in table 2, "ease of understanding" construct has a mean value equal to 5.55 which is greater than relatively favorable option and tends to favorable in the thirteen universities. The greatest elasticity towards favorable side belongs to Amir Kabir University (6.63). the "internal performance" construct has a mean value equal to 5.98 and is very close to favorable side. Potential gap between "ease of use" dimension real value and favorable value (7) is 1.24 for all universities. The lowest values of this dimension belong to websites of central libraries of "Amir Kabir University", Isfahan University of Technology", and "Science and Technology University", respectively. The greatest value belongs to "Tehran TarbiyatMoallem University".

**Table 3.conditions of the constructs of entertainment dimension for websites of central libraries of Iranian Public universities**

row	entertainment universities	Visual attractiveness	creativity	Emotional attractiveness	Total mean	Potential gap (with respect to 7)
	Tabriz University	3/04	2/94	3/66	3/21	3/79
	TarbiyatModarres University	3/50	3/84	4/08	3/80	3/2
	TarbiyatMoallem University	4/19	4/10	4/37	4/22	2/78
	Tehran University	4/28	4/33	4/28	4/29	2/71
	ShahidBeheshti University	4/32	4/48	4/17	4/32	2/68
	Ahwaz ShahidChamran University	4/19	4/16	5/46	4/60	2/4
	Isfahan University of Technology	5/92	4/88	4/86	5/22	1/78
	Amir Kabir University	4/63	4/96	4/50	4/69	2/31
	KhajehNasiroddinTousi University of Technology	2/74	3/95	4/40	3/69	3/31
	Sharif University of Technology	3/88	5/35	5/86	5/03	1/97
	Science and Technology University	3/49	3/58	4/57	4/88	3/12
	Mashhad Ferdosi University	4/5	4/32	4/40	4/40	2/6
	Mazandaran University	5/94	4/95	5/26	5/38	1/62
	Total mean	4/20	4/29	4/60	4/36	2/64

As it can be seen in table 3, there is not any considerable difference between 3 constructs of "entertainment" dimension in the 13 websites and total mean of all three constructs ranges between average (4) and relatively favorable (5). Therefore, total mean of the three constructs is in the mentioned range (4.36). Potential gap of "entertainment" dimension with respect to very favorable (7) choice is equal to 2.64 in all universities and the main barrier against favorability is "visual attraction" construct.

**Table 4.conditions of the constructs of friendly relationships dimension for websites of central libraries of Iranian Public universities**

row	Friendly relationships universities	Homogeneous image	Online completeness	Relative advantage	Total mean	Potential gap (with respect to 7)
	Tabriz University	3/86	3/69	4/26	3/93	3/07
	TarbiyatModarres University	5/75	4/97	6/13	5/61	1/39
	TarbiyatMoallem University	5/46	5/38	4/8	5/21	1/79
	Tehran University	6/12	5	5/7	5/60	1/4
	ShahidBeheshti University	5/19	4/25	5/46	4/96	2/04
	Ahwaz ShahidChamran University	5/46	4/81	5/48	5/25	1/75
	Isfahan University of Technology	5/45	6/18	6/10	5/91	1/09
	Amir Kabir University	5/33	5/94	6/12	5/79	1/21
	KhajehNasiroddinTousi University of Technology	4/59	4/46	4/72	4/59	2/41
	Sharif University of Technology	5/76	5/43	5/42	5/53	1/47
	Science and Technology University	5/70	5/34	5/37	5/47	1/53
	Mashhad Ferdosi University	5/40	4/57	4/99	4/98	2/02
	Mazandaran University	5/72	5/12	5/88	5/57	1/43
	Total mean	5/36	5/01	5/41	5/26	1/74

According to table 4, the three constructs of “friendly relationships” dimension are equal to relatively favorable point (5) and this makes total mean of this section close to favorable side (score equal to 5.26). “Homogeneous image” construct mean value is slightly greater than relatively favorable (5.36) in the 13 universities. The greatest role in tendency to favorability belongs to Tehran University (6.12) and elasticity is towards very favorable. “Online completeness” has a total mean equal to 5.01 and a great elasticity towards relatively favorable. The lowest score (3.69) belongs to website of central library of Tabriz University and the greatest score belongs to Isfahan University of Technology (6.18) in this construct. “Relative advantage” construct has a total mean equal to 5.41 which is beyond relatively favorable limit and has a tendency to favorable side.

Potential gap of this dimension with respect to “very favorable” side is equal to 1.74 in all websites and the most important barrier against achieving the “very favorable” status is “online completeness” (5/01).

## CONCLUSION

The present research evaluated websites of central libraries of 13 public universities in Iran from 650 respondents' viewpoints. Results showed that total mean of the “information suitable for tasks”, “appropriate communications”, “trust” and “response time” constructs was equal to 5.23 for usefulness variable in websites of central libraries of all 13 universities and difference between mean values and “very favorable condition” was equal to 1.77. in this dimension, the lowest total mean value belonged to Tabriz University (4.19) with a potential gap equal to 2.81 and the greatest total mean value belonged to Amir Kabir University of Technology (5.59) with a potential gap equal to 1.05.

Total mean of the constructs of “ease of use” dimension (ease of understanding and internal performance) in all 13 universities was equal to 5.76 and its potential gap was equal to 1.24 with respect to “very favorable condition (7)”. The mean value is between “relatively favorable (5)” value and “favorable value (6)”. Of course, electricity is towards favorable side.

The greatest total mean value in this dimension was equal to 6.70 which belongs to Amir Kabir University of Technology and the lowest mean value was equal to 5.17 which belongs to website of central library of Tehran Tarbiyat Moallem University and has a potential gap equal to 1.83 and lies between relatively favorable (5) and favorable (6) values and has a strong elasticity towards relatively favorable side.

In “entertainment” dimension, total mean value of constructs was equal to 4.36 and it had a potential gap equal to 2.64 with respect to very favorable condition (7).

In this dimension, the greatest total mean value of the constructs was equal to 5.38 which belong to Mazandaran University and lowest mean value was equal to 3.21 which belong to Tabriz University. In “friendly relationships” dimension, total mean of constructs was equal to 5.26 and potential gap with respect to (7) was 1.74. in this dimension, the greatest total mean value was equal to 5.91 which belongs to the website of central library of Isfahan University of Technology and the lowest total mean was equal to 3.93 which belongs to Tabriz University.

A general review of the conditions of the dimensions of universities central library's websites quality evaluation instrument (WEBQUAL) reveals that “ease of use” dimension which has a total mean value equal to 5.76 has the best score in comparison with other dimensions and “entertainment” dimension which has a total mean value equal to 4.36 has the worst score in comparison with other dimensions.

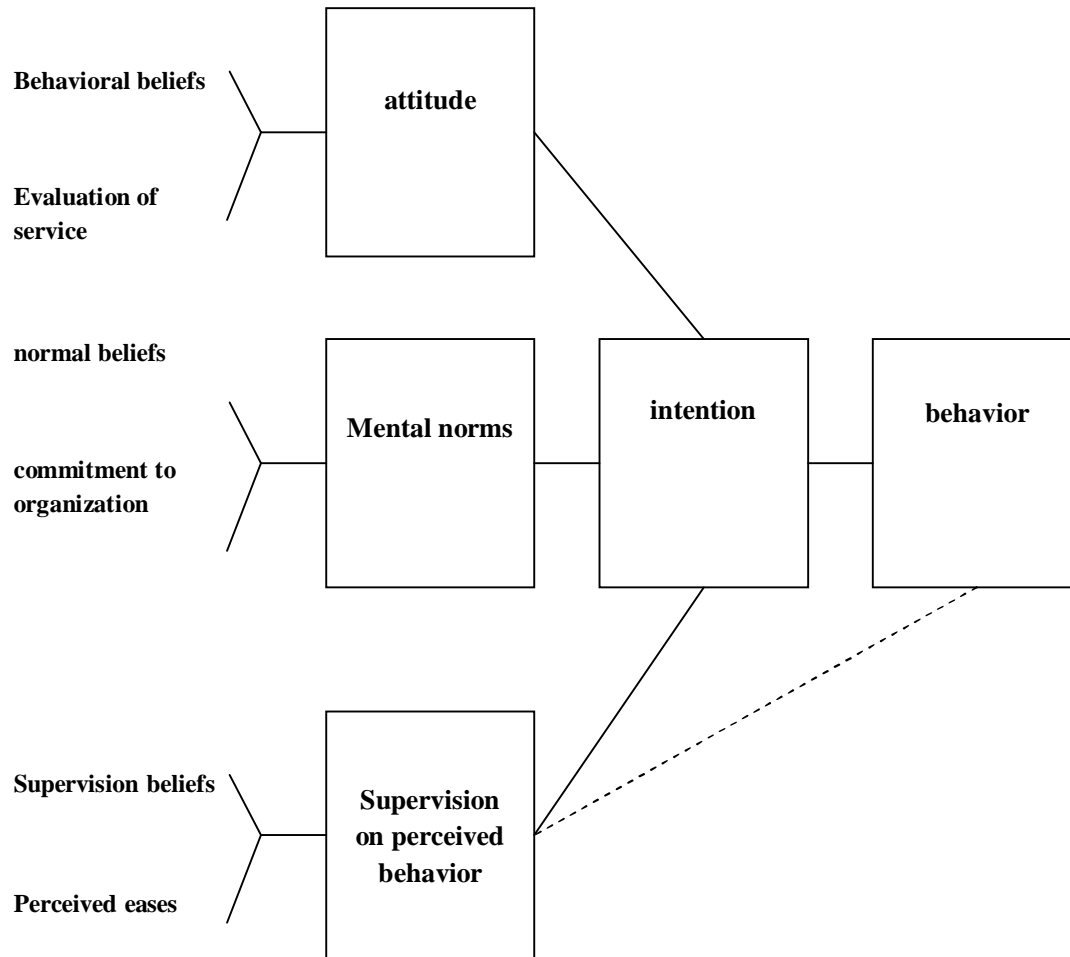
The greatest score was equal to 6.79 which belong to “internal performance” construct in “ease of use” dimension in Isfahan University of Technology and the lowest value was equal to 2.46 which belongs to “response time” construct in “usefulness” dimension in Tabriz University. The greatest total mean of the 12 constructs of the 13 websites was equal to 6 which belong to “trust” construct and the lowest value was equal to 3.86 which belongs to “response time” in “usefulness” dimension.

## Research conceptual model

Organizational websites are not only users' entrance to organizations but also their service quality and quantity produce images in users' minds based on which they evaluate organizations. Therefore, organizations in general and central libraries of universities in particular, should design and maintain their websites life cycles carefully. Central libraries of universities should think about two things:

1. integration is an important factor in website design. Thus, we cannot consider only one single factor.
2. users have more expectations from websites than traditional entrances because advertisements and publications have been concentrated on benefits of electronic access to information in comparison with traditional methods. Therefore, concepts like speed, ease of access, entertainment and ... have special perspectives. As it can be seen in figure 1, users' beliefs and their beliefs reflection in behaviors are the base of evaluation of organizational service. Therefore, some values are formed in users' minds when they use a website once and future behaviors are resulted from previous judgments and its repetition creates a general image in users' minds. The only way to change users' negative impression and image of a website is to continuously

adjust and amend it and invest in improvement of all items, constructs and parts and therefore integrate and totalize the website.

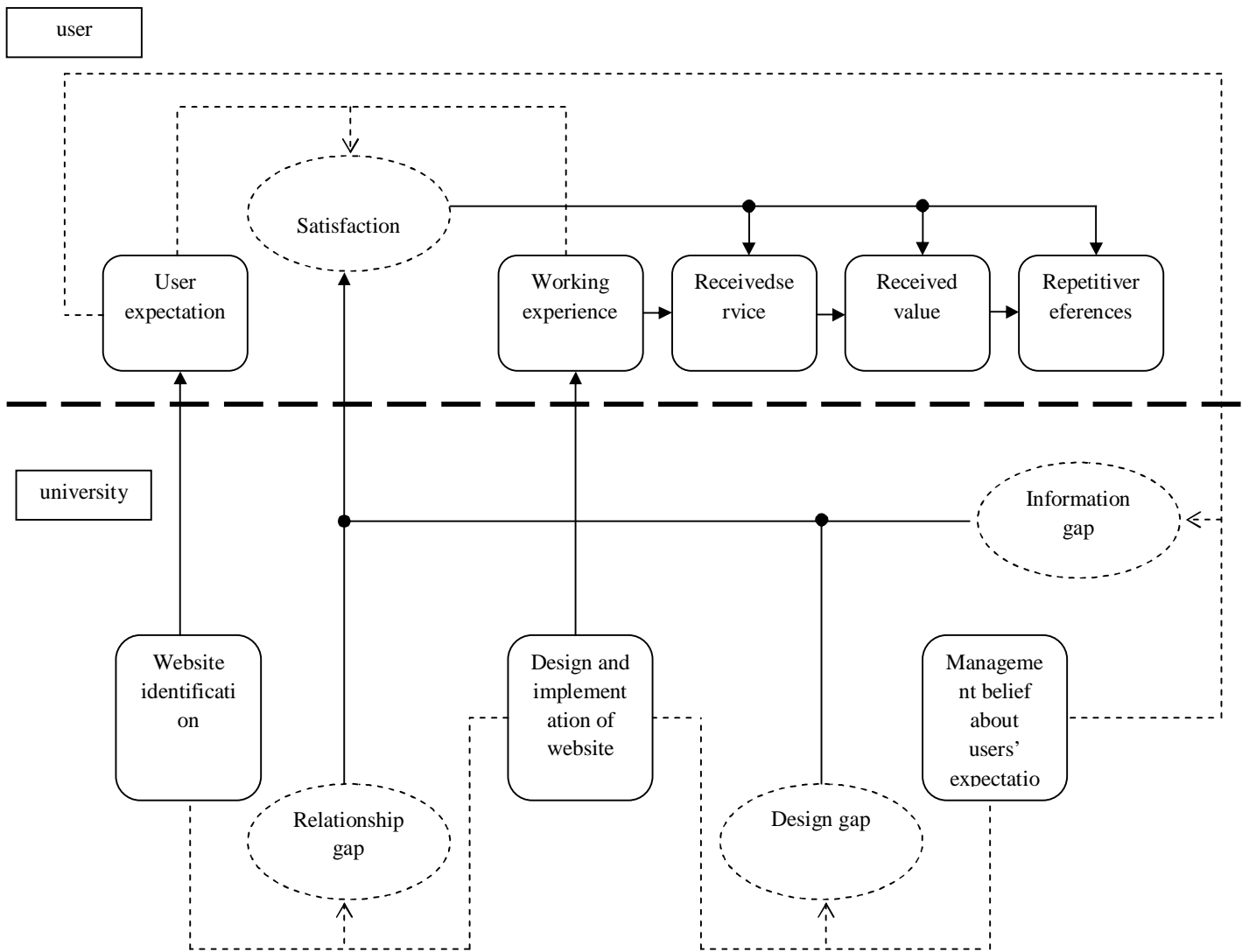


**Figure 1. Targeted behavior in referring to a website**

Therefore, some values are formed in users' minds when they use a website once and future behaviors are resulted from previous judgments and its repetition creates a general image in users' minds. Results of the present research showed that some of the elements of service quality in university libraries websites are above acceptable level and some are below. Since users' feedbacks are important in recognition of quality, organizations should increase service quality. According to users' ideas, university libraries websites are weak from two viewpoints: "response time" and "entertainment". Results showed that users' were not satisfied with "websites loading speed" and "transaction waiting time" in "response time" dimension. Since website performance speed is a technical issue, it is necessary for universities to conclude contracts with Ministry of Sciences or telecommunications Company in order to increase bandwidth or take other useful technical measures. Visual attractiveness of websites is also another important issue in attracting users to use information and repeat their references. Thus, it is necessary to use graphical and designing expert's experiences in order to design attractive websites and recognize graphical interests of users. Our traditional culture is internal judgment culture based upon signals. In other words, inputs make us judge about hidden aspects, even when we have not seen the inside before. This cultural feature should be considered in designing websites for libraries and it should be taken seriously.

Conceptual model developed for university websites should be based upon two basic assumptions: 1. Website integrity importance and 2. Users' beliefs and expectations

Therefore, a conceptual model should be able to characterize weak points of website elements and try to remove them. Each gap is in fact the difference between favorable conditions and present real conditions. In the present model, gaps of potential gaps were classified into 4 main articles: 1. Information gap, 2. Design gap, 3. communication gap and 4. Fulfillment gap.



**Figure 2. Conceptual model for improvement of service quality of websites of central libraries of Universities**

**1. information gap:** information gap is in fact the distance between users' expectations from websites and managers' beliefs knowledge about these expectations. University website users may have different expectations in comparison with commercial and advertising websites. Speed of response may also be more important to university websites than sense of security. Discovery of expectations in all types of websites can reduce information gap between management and website users' ideas and minimize potential gap between the present conditions and favorable conditions.

**2. Design gap:** primary design of a university website should be based on users' ideas and it should be actually a suitable feedback to users' ideas. Sometimes, users' ideas are collected and their expectations are recognized (there is no information gap) but they are not included in website design. In other words, design gap is not necessarily resulted from information gap but it is resulted from not applying information to website structure design.

**3. Communication gap:** this gap is resulted from absence of designers' proper understanding about its features, capabilities and restrictions. Communication gap in websites may not only arise from clear traditional media factors but also it may be resulted from ignorance of websites infrastructure. This gap-for any reason-affects interactions between user and website and although it is an internal gap, it is expressed in appearance of website and the website does not achieve its predicted goals.

**4. satisfaction gap:** satisfaction gap and achieving expectations takes place for users and is defined as a distance between users' expectations and what they experience and has two different shapes: one of the is resulted from designing and implementation of website and is as a result of communication gap and disregarding users'



feedback. The other is resulted from incomplete service transactions which fail to satisfy users' needs. As it can be seen in figure 2, it is a combination of information gap, design gap and communication gap.

In general, the conceptual model presented in figure 2 provides a general view of understanding and improvement of service quality in websites of central libraries of the studied universities and considers each website from two different outlooks: one of them is application outlook and the other is university library perspective. However, events and transactions of these two viewpoints affect each other and there is a complex network or communications not only in each layer but also in interaction between the two layers. Weakness or strength of each of the elements of this network has direct and indirect impact on weakness and strength of other elements. Hence, when technical elements are improved and access speed and time are adjusted, feedback with respect to other elements may also be affected and entertainment may also change response time scoring within the framework of users' feedback. If integration principle is regarded in designing and operating a website, as it has been included in the conceptual model, we can understand that failure in one part of the website is affected by other failures in other elements and affects them mutually.

Future studies may indicate that how changing one element can affect other constructs and elements in users' evaluation.

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The authors declare that they have no conflicts of interest in the research.

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