

Identification of service Quality dimensions and measuring service quality of university library from users' point of view in Persian Gulf University

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ABSTRACT

Libraries and data centers are service establishments whose main task is linking the society with knowledge and information through their efficient services. The main aim of this paper is Identifying service Quality dimension and measuring service quality of the university library from user view. A survey was conducted among the students and faculty members of PGU using a modified version of SERVQUAL and LIBQUAL questionnaire. The data given here is based on a random survey of 400 faculty members and students studying at PGU. The dimensions of service quality were determined through exploratory factor analysis. The data was analyzed by paired -samples T test using spss. The results obtained through exploratory factor analysis suggest that university library service quality consists of four dimensions – i.e. affect of electronic access , affect of service (personal), understanding/knowing the user needs, library as a place, and affect of internal position collection and access, – which are different from SERVQUAL's original dimensions. The study shows that in all LIBQUAL dimensions, the average gap between the expectations and perceptions of the users of the library services is negative. The paper provides valuable results concerning the determinants of the perceived value of library services from the users' perspective.

Key words: Service Quality, Service Quality Measurement, University libraries, Servqual, Libqual.

Introduction

In the present era, factors like increasing production of information resources and their necessity in scientific and research areas, development of IT role in information and ... have made libraries more successful than before which adapt to new conditions and maintain their service quality level at an acceptable level. However, because libraries and information centers are among service organizations and their product is delivered in the form of service, their service quality measurement has its own difficulties [19].

Libraries are service organizations whose service quality has important role in development and distribution of knowledge. University libraries are important centers which are important in supporting educational, research and study missions and their main challenge is to be effective and efficient [17]. Libraries quality was formerly measured by size, books variety and journals and number of users. However, users are involved in evaluation process so that acceptable and valid results will be achieved [32].

Libraries former attempts in service quality evaluation were mainly based on irregular statistical

methods. From 1980 onwards, output-based evaluation approach started. According to this approach, criteria for performance measurement in a library's efficiency and effectiveness are mainly based on offering high-quality service to customers [17]. Library service quality performance indices have become so important that association of research libraries has placed it as its strategic comprehensive plan [1]. From 1990, many attempts have been done to use standard scales for evaluation of service quality. There are many service quality evaluation tools but many of studies use commercial and marketing service quality tools like Servqual, serv-perf and E-Servqual, which might not be directly applicable to university libraries. Many experts have discussed the limitations and capabilities of service quality model for university libraries and many of them believe that because this model was firstly used for commercial environments, it must be revised and adapted to be applicable to non-commercial environments. Various methods have been proposed for this [16]. The general Servqual is not completely verified by association of research libraries and this resulted in investigation of model and proposal of a new model for evaluating library service quality [27]. Measurement tool for

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library service quality is LibQUAL +TM, which was developed by association of research libraries and a few of faculty members of A&M Texas university and it has Servqual theoretical and conceptual framework but its dimensions have been adjusted. Other tools have been introduced through adjusting Servqual model, like LibQUAL+®.

The main goal of the present research is to use the adjusted Servqual model proposed by Zabed Ahmed and Shoeb [32] and LibQUAL model to identify university library service quality dimensions and evaluate the level of service quality provided in PGU in Boushehr from users' point of view and present some recommendations for solving the gaps in satisfactory service.

Literature review:

Evaluation of service quality in university libraries:

According to Iso 11620, service quality in libraries is defined as all characteristics and qualities of one service resource which affects library's capabilities for satisfying the clear and indistinct needs [6]. Libraries and general information centers are service-oriented and link university to knowledge and information through their effective service. These services must cover users' information needs with the emergence of new technologies. Libraries' quality was formerly measured by their size, books and journals variety and the number of users; this traditional method could not satisfy users' information needs successfully. Therefore, Servqual was developed as quality management index [10]. Some experts believe that Servqual is a new tool for evaluation of service quality and it can be used for planning and decision-making. Quality is the main philosophy of libraries [24]. From mid-1970s, service quality in libraries was defined as the difference between perceptions and expectations of users from service performance. Service quality concept has become important from when libraries try to develop their service and area of activity.

Libraries' service quality evaluation has received a lot of attention in the recent years by different experts like Cook and Heath [2], Cook and Thompson [3], Thompson *et al* [27], Cook *et al*, Youhua, *et al* [31], Thompson *et al* [28,29,30]. Many studies have been conducted to apply and localize Servqual model in libraries and information centers all over the world; many of these studies have been pivoted around ARL (association of research libraries) project in 1999 for identification of general indices of service quality evaluation. ARL and A&M University developed an index which led to correction and adjustment of Servqual model for using in libraries and formulation of LibQUAL +TM model. This model have been widely used for evaluation of university libraries service quality in different medical, legal, military, humanities, ...

fields [8]. From its introduction up to now, this model has been adjusted several times and its latest model is based on 3 models. This model had 8 dimensions in LibQUAL +TM 2000 version. In 2004, LibQUAL +TM had 3 dimensions. LibQUAL +TM has been tested in different countries like America, Canada, Australia, Egypt, England, France, Ireland, Holland, Scotland, Sweden and UAE and has been translated into 16 different languages. LibQUAL value has been documented and clarified in different literature. A review of Wilson's library literature and other scientific resources, about 100 papers re found with searching LibQUAL keyword [17].

Like Servqual, LibQUAL also tries to analyze the gaps between expectations and perceptions of customers from quality. LibQUAL is a tool for evaluating libraries performance.

In LibQUAL+TM 2001-2003, library service quality is evaluated in four dimensions: service effect, personal control, access to information and library as a place. This model measures user' expectations and perceptions from service based on 25 components of these four dimensions. This measurement is carried out through two questionnaires; one questionnaire is used for measuring users' expectations from service quality and another questionnaire for measuring their satisfaction from the present condition of service. The number of questions is equal in both questionnaires.

In LibQUAL+TM 2004-2006, library service quality is evaluated in three dimensions: service effect, library as a place and information control.

Service effect means how good is the service offered and how employees interact with users.

Information control means how easily resources and information are accessible and with what quality are they offered to users.

After collecting information on expectations and perceptions of users, the level of quality offered in the library is determined. This is done through gap analysis model and measuring difference value between expectations and perceptions of users; the less is the difference between users' expectations and perception in a dimension, service quality level in that dimension is higher and vice versa. Finally, solutions are proposed for improving service quality level in each dimension based on the results of analyses.

Research Background:

After the introduction of Servqual model, many studies were conducted to apply this model to measuring service quality. These studies were conducted in measuring service quality in Hotels, hospitals, educational institutes, IT centers, supply chain service, hygiene sector service and service quality measurement in banking industry.

Furthermore, many developmental studies have been conducted to localize the application of this model to special organizations. One of these studies is ARL studies which led to the formulation of a new model called LibQUAL. This model is specific to measuring service quality in libraries. Results of these studies show the ability of this model is measuring service quality. Many management experts believe that Servqual is a good tool for evaluating service quality and recommended that libraries managers think about using this tool for evaluating libraries service quality.

Many studies have been conducted in order to localize Servqual model in library and information centers sector all over the world. Some of these studies are: Martin [18], Nagata *et al*, Satoh *et al*, Sahu, Green and Zabed Ahmed *et al* [32], which resulted in the correction and adjustment of Servqual model for using in libraries and formulation of LibQUAL model [32].

Many studies in the field of service expectations have been conducted by students [13]. Some graduates [12] have studied users [15], and some others have studied the success of executive measures of LibQUAL for development of libraries service quality [9,11]. Other studies are as follows:

Thapisa, and Gamini [26] evaluated and investigated the perceptions of Boston University customers and this center's success level in offering high-quality service.

Dadzie [4] showed the important role of high-rank managers in organizing and investigating the capabilities, challenges and limitations of library in offering high-quality service in Universities in Ghana.

Shoeb [23] evaluated the general quality of service in Bangladesh I.U.B University using Servqual adjusted questionnaire and with considering 3 factors of service effect, access to information and library as a place. He verified the validity of this model for evaluation of service quality. His research indicated that service effect dimension is the most important factor is library service quality.

Lanen *et al* [17] investigated the validity of LibQUAL + ® over time. They used factor analysis and showed that no changed is observed in the validity evaluation of library service quality over time and the dimensions service effect, library as a place and information control are three factors that determine service quality. Kiran and Diljit [16] investigated library web-based service quality using Servqual gap model and LibQUAL+® and tested the model validity using structural equations model, exploratory and confirmatory factor analysis. Furthermore, Sahu evaluated the service quality in javahir Lal Nihro University using Parasuraman, *et al* model [20].

In Iran, this model has been used in libraries. In Yazd University, a study was conducted to evaluate

university libraries service quality using LibQUAL model [19]. Another research was conducted by Hibibollah SalarZehi *et al* [21] in Sistan and Balouchestan University using standard LibQUAL with four factors of service effect, library as a place, personal control and access to information. This research showed that there is negative gap in all dimensions of service quality. Several Master Degree theses have been also done in this field:

Master degree thesis conducted by Mohsen Shams Ajyieh [22] with the subject of comparison of 3 levels of public service quality evaluation (reception level, expectations level and the least level of service reception) in Ahvaz Shahid Chamran University central library using LibQUAL model in Ahvaz Shahid Chamran University.

Master degree thesis authored by Maryamossadat Derakhshan [5] titled "evaluation of service quality in central library of National organization of management and planning" in Tarbiat Modarres University.

Master degree thesis authored by Zahra kazempour [32] titled "evaluation of service quality in central library of technical and engineering universities of Tehran using LibQUAL model" in Tehran University.

Master degree thesis authored by Najaf Gholi Nejad titled "evaluation of service quality in the central library of Tarbiat Modarres University using LibQUAL model, Tarbiat Modarres University.

Some quantitative studies investigated the structural validity of LibQUAL. In 2002, an exploratory factor analysis was conducted on 25-item LibQUAL model and 4 dimensions were identified. Following this research, a confirmatory factor analysis was conducted and model validity was verified. Exploratory factor analysis has not been conducted in Iran up to now and only the general LibQUAL model has been translated and used. Therefore, it seems necessary to conduct a study using exploratory factor analysis.

The present study is different with other studies in that exploratory factor analysis is conducted first in order to identify factors. In order to conduct a factor analysis, scale questions were selected based on the standard and general model of Servqual and four-factor and three-factor LibQUAL and adjustment and from service quality indices based on information technology and based on web. Then, factors were identified using exploratory factor analysis and the gaps in the identified factors were evaluated.

Conceptual model and research questions:

Elements of the conceptual model and the process of research are as follows:

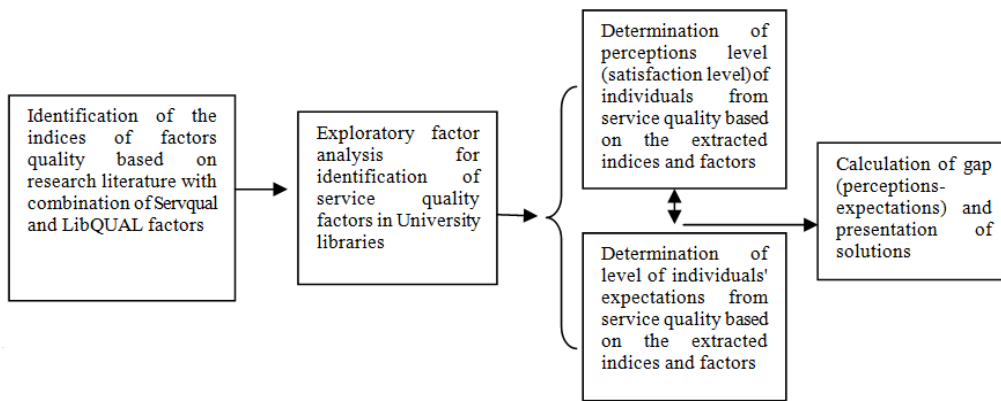


Fig. 1: Research conceptual model.

Research Method:

The present research is an applied research. In terms of level of variables control, it is descriptive and it is a survey study its execution method. In order to gather data in the present research, service quality questionnaire based on Servqual model dimensions and four-factor and three-factor LibQUAL models were adjusted and IT-based and web-based service quality dimensions were used after adapting and adding some questions to become more appropriate to library service nature. Analysis process included the identification of questions whose reliability and validity were verified in the previous studies and after that, their validity was investigated by experts' opinions. Then, exploratory factor analysis was conducted with 33 questions so that service quality factors were extracted and service quality gap was evaluated based on the extracted factors and using

gap analysis model (service quality perceptions-service quality expectations) and after that, research hypotheses were tested. Measurement tool in this research consisted of two parts. In the first part, individuals' perception of received service was measured in 33 questions and based on Likert 5-point scale (5=completely agree, and 1=completely disagree); the second part of the measurement tool consisted of evaluation of individuals' expectations from received service in the dimensions based on 5-point Likert scale (5=completely agree and 1=completely disagree).

Statistical population of this research included all users of library service (students and faculty members of PGU). In order to determine sample size, Cochran sampling formula was used. According to the statistical calendar of PGU, population size was 3180 people and 362 people were obtained through Cochran sampling formula:

$$n = \frac{NZ_{\alpha/2}^2 p(1-p)}{\epsilon^2(N-1) + Z_{\alpha/2}^2 p(1-p)} = \frac{3180 \times (1.96)^2 \times (0.5) \times (0.5)}{(0.05)^2(3179) + (1.96)^2 \times (0.5) \times (0.5)} = 362$$

Considering the fact that in many studies, it is possible to not receive some of the distributed questionnaires and in order to satisfy necessary and adequate sample size, 450 questionnaires were distributed and 400 complete questionnaires were used in the analyses.

Cronbach's alpha was used for investigation of the questionnaire reliability; alpha was calculated to be 0.951 which is very suitable for reliability. Apparent and content validities were tested in order to test the validity of the models. Research questionnaire was given to some experts and their opinions were collected and some of the ambiguous questions were corrected and then factor analysis was used for general validity test. Indices like KMO and BTS were also calculated. KMO index is a test for sample adequacy. BTS test also indicates that is the factor model appropriate or not? In general, the two

indices show that use of factor analysis is appropriate for analysis.

All of the scales used in the present study had high reliability and validity. The present study has a role in development and spread of the reliability and validity of the mentioned scales. Paired-samples t-test was used to test the hypotheses and questions and gap significance test.

Data analysis and discussion:

Exploratory factor analysis for extraction of factors and identification of indices:

Exploratory factor analysis was used to determine service quality indices structure (answer to question 1). First, possibility of conducting factor analysis was investigated by means of Bartlett and KMO tests (table 1).

Table 1: KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	6113
	Sig.	.000

According to the results of the tests in table 1 for KMO and BTS, data is suitable for factor analysis. Factors hidden in the test were extracted by means of principle components analysis and Varimax rotation. Factor loadings show the level of variables correlation with factors; if the correlation is higher than 0.6, it means that factor loading is high and if it

is greater than 0.3, it means that factor loading is high and if it is smaller than 0.3, it means that the item can be eliminated. Furthermore, factors whose factor loadings square sums (eigen values) are greater than 1 are kept. All factor loadings were greater than 0.3 and all eigen values were greater than 1.

Table 2: Eigenvalues which are greater than 1 for the extracted factors.

factors	Eigenvalues	% Variance	cumulative % Variance
Factor 1	12.94	39.216	39.216
Factor 2	3.656	11.08	
Factor 3	2.014	6.104	
Factor 4	1.467	4.44	
Factor 5	1.289	3.90	64.75

As it can be seen, 5 factors were obtained with eigen values greater than 1 in this model (table 2). It must be noticed that after conducting factor analysis, indices were broken into 5 factors and new names were chosen for each of the factors.

Results show that items classification into 5 factors explains 64.75% of variance. Considering the results of factor analysis, the following factors are categorized into factor 1, because they have the highest weight in this factor in comparison with other factors. This factor can be called "electronic access to resources and sets" according to research literature and the items which are placed in this category. Sum of the points of this factor is 12.94 which explain 39.216% of the variance. Therefore, it can be said that this factor has the most influence on service quality of library in comparison with other factors. These items include questions number 26, 27, 28, 29, 30, 31, 32, 33 as listed in table 3.

According to the results of factor analysis, the following items are placed in factor 2. This factor can be called "personnel service" based on research literature. Sum of the points of this factor is 3.656 which explain 11.08% of the variance. Therefore, it can be said that this factor ranks second in comparison with other factors. These items include questions number 7-8-9-10-11-12-13, as listed in table 3.

According to the results of factor analysis, the following items are placed in factor 3. This factor can be called "library as a place" based on research literature. Sum of the points of this factor is 2.014 which explain 6.104% of the variance. Therefore, it can be said that this factor ranks third in comparison with other factors. These items include questions number 1-2-3-4-5-6, as listed in table 3.

According to the results of factor analysis, the following items are placed in factor 4. This factor can be called "specific attention and user

understanding and recognition" based on research literature. Sum of the points of this factor is 1.467 which explains 4.44% of the variance. Therefore, it can be said that this factor ranks fourth in comparison with other factors. These items include questions number 14-15-16-17-18-19, as listed in table 3.

According to the results of factor analysis, the following items are placed in factor 5. This factor can be called "conditions and internal access to resources" based on research literature. Sum of the points of this factor is 1.289 which explains 3.09% of the variance. Therefore, it can be said that this factor has the least influence on library service quality in comparison with other factors. These items include questions number 20-21-22-23-24-25, as listed in table 3.

Conclusion and discussion of the gaps in dimensions of service quality and determination of components priority in order to take corrective actions:

In this section, the gap in the five extracted dimensions of service quality is calculated based on gap analysis model. Therefore, the gap between users' perceptions and expectations was calculated. A negative point of service quality gap shows that in such components, library service had not been able to satisfy the users' expectations. The results are summarized in table 3.

According to the means of expectations and perceptions, the greatest gap was observed in dimensions: access to online references through PC, appropriate use of signs and symbols in library for visual demonstration of service, on-time provision of references as demanded, especial attention of employees to each of users, easy access to printed journals, and attention to users' preferences, respectively. According to gap level, these items are

at top priority for corrective measures; items like cleanliness of library space, neat appearance of library personnel, on-time fulfillment of promised

service, assurance of personal information secrecy and modern equipment for accessing information are at the end of corrective measures priorities.

Table 3: Mean of overall user responses for expected and perceived in service quality at PGU.

Item of service quality	Perceived	Expected	Gap difference	Mean rank
1. modern equipment for accessing data	2.87	4.74	-1.87	22
2. neat appearance of library personnel	3	4.67	-1.66	24
3. beauty of physical equipment like building, internal view and shelves layout	2.75	4.7	-1.96	16
4. cleanliness of library physical environment	3.12	4.73	-1.61	25
5. convenience and attractiveness of library space for individual activities	2.73	4.70	-1.97	15
6. calmness of library space for study and learning	2.80	4.73	-1.93	18
7. implementation of promised service in a timely manner by employees	2.94	4.74	-1.8	23
8. personnel contribution to users with satisfaction	2.8	4.76	-1.96	16
9- employees' preparedness for answering the users' questions	2.75	4.72	-1.97	15
10-library personnel knowledge for answering the questions	2.81	4.75	-1.94	17
11. employees' interest and enthusiasm for answering questions	2.68	4.74	-2.06	9
12. personnel politeness towards users	2.76	4.75	-1.99	13
13. kind behavior of employees towards users	2.84	4.72	-1.88	21
14. users' awareness from service offering time	2.80	4.72	-1.92	19
15. users' needs understanding	2.64	4.74	-2.1	6
16. considering users' preferences	2.60	4.71	-2.11	5
17. ultimate care and minimum delay in serving users	2.66	4.73	-2.77	8
18. special attention to users demands' nature	2.59	4.73	-2.14	3
19. Library working hours is suitable in different times.	2.77	4.74	-1.97	1
20. visual demonstration of service types with signs and symbols	2.53	4.72	-2.19	1
21. easy access to printed journals	2.61	4.74	-2.12	4
22. easy access to books and references	2.77	4.78	-2.01	12
23. internet site fir access to library references	2.88	4.78	-1.9	20
24. welcoming opinions, recommendations and criticisms	2.68	4.76	-2.08	7
25. physical conditions of references in different sets	2.75	4.73	-1.98	14
26. access to e-references and online references through personal computers	2.58	4.77	-2.19	1
27. Needed references are provided as soon as demanded.	2.60	4.75	-2.15	2
28. provision of information needs necessary for academic majors	2.75	4.78	-2.03	11
29. access to online library lists	2.83	4.79	-1.96	16
30. internet site of the library contains all necessary information.	2.79	4.78	-1.99	13
31. access to electronic references of library from home or work office	2.70	4.78	-2.08	7
32. easy access to electronic references	2.73	4.77	-2.04	10
33. accuracy and secrecy of personal information	2.99	4.79	-1.8	23

Conclusion and discussion on the investigation of gap significance in library service quality dimensions:

Table 7 shows the results of analysis of significance of gaps in the 5 dimensions of library service quality using paired samples t test.

According to data in table 7 and significance of t value and the fact that zero gap (absence of gap) is not placed in 95% confidence interval for any of the dimensions, it can be concluded that means differences are significance in all factors, in other words, absence of gap hypothesis is rejected and presence of gap is verified. Results of investigation of significance of gap between perceptions mean and expectations mean showed in 5 dimensions of service quality using paired samples t test showed that this library is not at a satisfactory level in any of the

dimensions and has not been able to satisfy users' expectations. Results of this study can help managers with recognizing library strengths/weak points, development of service quality culture and prediction of users' expectations. Library management can plan for and measure the expectations of users to satisfy their needs and expectations. The following solutions are recommended: reception of users' opinions in order to recognize their expectations correctly, presentation of exact definitions from users' expectations and employees' awareness of users' expectations. Furthermore, the points of users' perceptions of library service quality show that their perception of service quality level is lower than average point (3) in all dimensions except for personnel neatness and library environment cleanliness. The greatest gaps observed are respectively in special attention and user's

understanding and recognition, conditions and internal access to references and electronic access to references. The smallest gap was related to the third factor i.e. library as a place and second factor i.e.

personnel service. Therefore, the main problem in the library is access to references and information including printed or electronic information and the conditions related to them.

Table 4: The significance of means difference between perceptions and expectations of users in service quality factors at PGU

Service quality dimensions	Expectations mean	Perceived mean	Service quality gap mean	95% confidence interval of the difference		T	Sig (2-tailed)
				lower	Upper		
Factor 1	4.788	2.751	-2.037	-2.123	-1.95	-46.207	0.000
Factor 2	4.756	2.821	-1.94	-2.038	-1.842	-39.032	0.000
Factor 3	4.722	2.899	-1.819	-1.904	-1.734	-42.008	0.000
Factor 4	4.734	2.678	-2.065	-2.170	-1.96	-38.741	0.000
Factor 5	4.764	2.709	-2.055	-2.146	-1.965	-44.575	0.000
General service quality	4.769	2.808	-1.957	-2.048	-1.867	-42.487	0.000

Recommendations:

Considering the importance of service quality in service organizations and the fact that application of this method is continued in university libraries all over the world, the results of this study will help managers and library personnel with identification of dimensions effective in service quality and investigate their present situation and formulate strategies to fill the gaps and satisfy the beneficiaries.

Researcher's recommendations for this study are as follows:

- The library needs to invest more in development of electronic references and information, development of physical conditions and references and access to them.
- Information requirements must be identified and the library should be equipped based on that. Digital equipment should be provided in order to facilitate access to electronic and online references.
- Considering the fact that the greatest gaps were related to access to e-references through PCs, appropriate use of symbols and signs in the library for visual demonstration, on-time provision of demanded references, especial attention to users', easy access to printed journals in the library and attention to users' preferences, respectively, it is necessary to take appropriate actions in these cases.
- Considering the gap observed in the factor internal access to references, it is advised the library references to be evaluated and investigated to check if: there is no limitation in access to references; the number and variety of the printed references are suitable for potential needs; printed references (including books and journals) are up-to-date and new versions are available; the number of versions from each title is adequate; a clear and formulated direction is present for selection and collection of printed references; a balanced ratio of references is available; references have enough quality; volume and quality of references is of acceptable growth; protective measures are taken in order to keep references; references are provided for especial users with special needs; references are provided in different languages; side service like printing is offered in the library.

- considering the importance of e-access factor, it is recommended that possibility of borrowing, requesting, reserving and extending is provided through internet or telephone; it is also advised that electronic or telephone high-quality service is provided and the library has electronic list; the library has e-mail address and website and necessary information is provided through the website; online lists of the library are accessible easily, and the website contains all necessary information; easy access to electronic references is provided from home, work office and so on; electronic references are accessible easily through PCs.

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Tsinghua University -European Institute of Business Administration Joint EMBA Program. School of Economics and Management. European Institute of Business Administration (France). Tsinghua University-University of California at Berkeley Joint Master's Program in Bioengineering and Translational Medicine. Tsinghua-Berkeley Shenzhen Institute. University of California at Berkeley (USA). The study investigates and measure the service quality level of Nijhoom-through SERVQUAL-model statements that means that we measure customer expectations and customer perceptions and make a comparison between different areas of service more. The study investigates and measure the service quality level of Nijhoom-through SERVQUAL-model statements that means that we measure customer expectations and customer perceptions and make a comparison between different areas of service given by the organization. To do this Five-Point Likert Scale has been used to survey on tourists.