Assessment of Library Service Quality

At

Thammasat University Library System

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Abstract

This study examines the overall service quality of Thammasat University Library System from users' perspectives, as well as identifies the dimensions that determine the customers' evaluation of service quality The concept of the *Zone of Tolerance* was applied to investigate which are the essential attributes that library managers should allocate the resource for good service quality. The problems users had encountered when involved in library service are also investigated in this study.

A survey of undergraduate students, graduate students, facutly members and researchers was used. The modification of SERVQUAL questionnaires were distributed for data gathering. Several insight gained from this study shown that all users desired expectations are not met. The result of the *Zone of Tolerance* reveals that each user group was treated differently. The three dimensions of service quality ; Affect of service – Organizational, Collection&Access, and Affect of service – Personal were extracted by factor analysis method. The problems users encountered when involved in library service are counted manually and categorized into free categories. The most problematic is about insufficient and non update collection. Some useful recommendations are presented to improve service quality of TU library system.

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Introduction

Background

Academic libraries are facing two major threats : a global digital environment and increasing competition. They must improve the quality of their services in order to survive. (*Cullen, 2001*) Historically, the quality of an academic library has been described in terms of its collection and measured by the size of the library's holdings and various counts of its uses. " A measured of library quality based solely on collections has become obsolete" . Alternative approaches to measure quality emerge in the business sector. Specifically, through marketing research, the SERVQUAL (*which was developed by A. Parasuraman, Valarie A. Zeithaml and Leonard L. Berry*) has evolved as an instrument to measure service quality and what customers values as important. SERVQUAL is a mechanism to shift the assessment of quality of a library from the traditions of measuring collection size and counting incidents of its uses, to begin investigating how the provision of services relates to the library users' service quality expectations (*Nitecki, 1996*). SERVQUAL has been used in various service industries, including academic, public, and special libraries. (*Hernon, 2002*) . It is important for libraries to know how well their performance by getting feedback from users because it is the factor for libraries to succeed in service performance.

This study used the adapted version of SERVQUAL to examine the library service quality of Thai academic library and explore how the service factors derived from the factor analysis were related to user expectation.

Study Problem

In Thailand, the quality of educational development and its academic excellence has been emphasized in the eighth National Economic and Social Development Plan (1997-2001). The Ministry of University Affairs has played a significant role to encourage higher education institutions in maintaining and improving their academic standards so that they can produce graduates who satisfy the need of employers. In order to achieve the objective, the quality assurance policy was proclaimed for institutions to implement for better productivity on July 8, 1996. The policy has required all public universities to improve and enhance their efforts for quality of instruction and the academic learning environment. (Bureau of Higher Education Standards, Ministry of University Affairs (*http://www.qa.mua.go.th /English/policy.html*) All academic libraries in Thailand including Thammasat University (TU) Library System as an academic service organizations are involved in such an environment inevitably.

The TU Library system is among the largest academic library system in Thailand and was established in 1934 along with the founding of the University. Thammasat libraries serve university students, staff, and faculty as its first priority members; other users include students, staff and faculty of other academic institutions, alumni, and paying members. Major portions of the collection cover the subject areas of social science and humanities, science and technology, applied science, and medical science. Presently, the libraries serve approximately 9,000 users per day consisting of: lecturers ,undergraduate students ,graduate students ,university staff ,as well as other users. The libraries' collections comprise 930,226 monograph

volumes. These consist of 625,619 books in the Thai language and 304,607 in foreign languages. The libraries have 2,235 journals in the Thai language and 2,123 journals in foreign languages. There are 6,323 documents in the Thai language and 8,325 documents in foreign languages in the collection. The library receives 32 newspapers; in addition, there are 20,835 audiovisual items, 46 CD-ROM databases and 9 online databases. Besides providing modern facilities to their users, the libraries have tried to improve the service quality continually by providing a various kinds of services such as inter-library loan , audiovisual material service and information retrieval in various subjects from internet and CD-ROM databases ; furthermore , individual and class instruction for users are provided on request. (*TU Library System ,* [*http://library.tu.ac.th/detail/about.html*](http://library.tu.ac.th/detail/about.html)*, and Self Study Report – SSR : Thammasat University Library System, Thammasat Univeristy (January1-June 30, 2002,63-64*) .

The TU library managers are also hearing user opinion via the various channels such as e-mail and poll box as well as doing the survey about library user's satisfaction at least once a year but service quality is multidimensional so the library managers must look for better ways to measure and describe the quality of their services. (*Hernon & Altman, 1998*) The result obtained from this study will help the library managers in understanding institutional and user differences and similarities, finding the user problems and reducing the gap between user perception and expectation.

Purposes of the Study

The purposes of the study are as the followings:
1.   To assess the overall service quality of TU Library System from the users' perspectives.
2.   To assess the service quality of TU library System from the perspective of each different respondent user group. (*Faculty/researchers, graduate and undergraduate students*) .
3. To identify the dimensions that determine the customers' evaluation of service quality in TU Library System
4.   To investigate which are the essential attributes that library managers should allocate the resource for good service quality.
5.   To identify the problems users had encountered when involved in library service.

Significance of the study

This research study deems to important because of the following reasons :
1. As the culture of assessment in libraries has strong international dimensions (*Kyrillidou and Hipps, 2001,* [*http://www.arl.org/newsltr/215/octsymp.html*](http://www.arl.org/newsltr/215/octsymp.html)), this study is international collaboration on assessing library service quality among scholars in Finland, Japan, United Kingdom and Thailand so the result obtained maybe confirm that there are global commonalities in the way users think about library service quality.
2. It is the chance to implement the study related to library service quality in Thai library community by using the adaptation of SERVQUAL and ;
3. This study may urge the new culture of assessment library service quality among Thai academic libraries.

Research Questions

The research study seeks answers to the following questions :

1. In what ways do TU Library System provide service to its users?
2. By individual group of users, in what ways do TU Library System provide service to its users?
3. By individual group of users, which attributes of service quality equal, exceed or fall short user perceptions?
4. By individual group of users, in what way do the users expect for excellent service quality from TU Library system?
5. What are the dimensions that determine the customers' evaluation of service quality in TU Library System
6. What are the most essential attributes that library managers should allocate the resources to support for improving excellent service quality?
7. What problems did the users encounter when involved in library service?

Scope and Limitations

1. This study is conducted to assess the library service quality for the purpose to help the library managers in understanding institutional and user differences and similarities. The data collected should not be seen as value judgments or as indicators or defining "good" or "bad" service.
2. The subjects in this study include 228 faculties/researchers, 165 graduate students, and 266 undergraduate students. The findings cannot be generalized beyond TU.

Chapter 2

Review of Related Literature

Introduction

Academic libraries are facing two major threats : a global digital environment and increasing competition. They must improve the quality of their services in order to survive. *(Rowena Cullen, 2001)* Traditionally, the quality of an academic library has been described in terms of its collection and measured by the size of the library's holding and various counts of its use. *(Danuta A. Nitecki , 1996)* According to Peter Hernon and Ellen Altman , most of traditional statistics gathered by libraries lack relevance and do not measure the library's performance in terms of element important to customers. They do not really describe performance or indicate whether service quality is good, indifferent, or bad. Even worse, the do not indicate any action that the administration or any team could or should take to improve performance. *(Perter Hernon & Ellen Altman , 1998)* The need to understand what library customers expect in terms of service quality is now necessary for good management. *(Philip Calvert, 2000)* so the library managers should extend the profitable way to assess library service quality. In business industries, SERVQUAL is an alternative instrument proposed to measure service quality from customer perspectives and perhaps it has been the most popular standardized questionnaire to measure service quality. *(Albert Caruna, Michael T. Ewing & B. Ramaseshan)* In the library setting, SERVQUAL was used to assess library quality service continually and it seems that culture of assessment in libraries had strong international dimensions as there is much potential for international collaboration on assessing library service quality. *(Martha Kyrillidou & Kaylyn Hipps,2000)*.

History of SERVQUAL

SERVQUAL was introduced in 1988 by A. Parasuraman , Valarie A. Zeithaml and Leonard L. Berry as an instrument for assessing customer perceptions of service quality in service and retailing organization. *(A. Parasuraman, et al., 1988)* It was consisted of 22 pairs of statements ,the first of which measure the expectations of a service provider's customers by asking each respondent to rate, on a seven-point scale, how essential each item is for an excellent service provider to deliver. The second set to 22 identical statements ascertains the respondent's perceptions to the level of service given by the institution or organization examined. For each pair of statements, the difference between the ranked perception and the ranked expectation is calculated; the average of the gap scores is the SERVQUAL overall quality score. *(Danuta A. Nitecki and Peter Hernon, 2000)*. The designers also developed the *Gaps model* of service quality and the definitions of each of the gap are as follows :

Gap 1: The discrepancy between customers' expectations and management's perceptions of these expectations;

Gap 2: The discrepancy between management's perceptions of customers' expectations and service quality specifications ;

Gap 3: The discrepancy between service quality specifications and actual service delivery;

Gap 4: The discrepancy between actual service delivery and what is communicated to customers about it; and

Gap 5: The discrepancy between Customers' expected services and perceived service delivered.

The first four gaps are the major contributors to the service-quality gap that customers may perceive. The fifth gap is the basis of a customer-oriented definition of service quality: the discrepancy between customers' expectations for excellence, and their perceptions of actual service delivered. This discrepancy is the conceptual basis for the SERVQUAL instrument. (*Danuta A. Nitecki, 1996*) The narrower the gap is, the better service quality is provided so the managers have to reduce Gap 5 as smallest as they can in order to provide excellent service to their customers.

To test the data by factor analysis, the designers concluded that SERVQUAL was consisted of 5 dimensions as follows:

Tangibles :	Physical facilities, equipment, an appearance of personnel.
Reliability :	Ability to perform the promised service dependably and accurately.
Responsiveness :	Willingness to help customers and provide prompt service.
Assurance :	Knowledge and courtesy of employees and their ability to inspire trust and confidence.
Empathy :	Caring, individualized attention the firm provides its customers.

Later, A. Parasuraman , Valarie A. Zeithaml, and Leonard L. Berry revised SERVQUAL to ask respondents to rate statements from three contexts (minimum service expectations, desired service expectations, and the perception of service performance) On a continuum, the minimum and desired service expectations appear at either end, with the area in between known as *the Zone of Tolerance*. The zone of tolerance represents the range of service performance that customers consider satisfactory. (*Peter Hernon, 2002*) According to Johnson (1995) Berry and Parasuraman defined the zone of tolerance in terms of the customer's evaluation of in-process service performances (Robert Johnson, 1995) :

The zone of tolerance is a range of service performance that a customer considers satisfactory. A performance below the tolerance zone will engender customer frustration and decrease customer loyalty. A performance level above the tolerance zone will pleasantly surprise customers and strengthen their loyalty.

The importance of the zone of tolerance was clarified by Marketing consultants for MCB University Press (2000) : Consumers have two different level of expectations for service quality : desired level and one they find adequate. A " Zone of Tolerance " separates the two. The managers should measure both levels of expectations because the service providers can fine-tune the way they allocate resources by incorporating the zone of tolerance framework. For example, a service provider with limited resources can improve customers' perceptions of service quality by making improvements to meet consumer's minimum expectation levels on the

most essential attributes first. The service provider can then devote more resources and attention to less essential attributes, and/or to better meeting desired standards.

SERVQUAL in Library Setting

The researchers of various subject areas contribute and adapt SERVQUAL as the instrument to assess service quality and also in library setting. SERVQUAL has been used in public, academic and research libraries continually. According to Rowena Cullen *(See Cullen(2001), for a useful review)* the modification of SERVQUAL model was introduced to academic library managers by Hernon and Altman . They used the data collected from surveys and focus groups to refine the SERVQUAL model in order to develop a robust survey instrument for use specifically in library and information services. Two later research projects have tested the validity of the standard instrument used in the SERVQUAL model. Nitecki's doctoral research tested the SERVQUAL instrument on the three aspects of library service- interlibrary loan, reference, and closed-reserve and concluded that the instrument was useful in determining how well services match user expectations. Hernon and Calvert tested the validity of the SERVQUAL instrument for evaluating academic libraries among library students and librarians, and came up with an instrument based on SERVQUAL.

Now, there is much potential for international collaboration on assessing library service quality as seen from a cross-cultural study comparing perceptions of service quality among library users in New Zealand and China and unequivocally concluded that there are global commonalities in the way users think about library service quality.(*Kyrillidou and Hipps,2001*)

Using SERVQUAL for Library Service Quality Assessment in Thailand

In Thailand, the first library service quality assessment by using SERVQUAL was conducted by Surithong Srisa-ard (*1997*) for the fulfillment of her doctoral dissertation " *User Expectations and Perceptions of Library Service Quality of An Academic Library in Thailand"* . The survey was set at an academic library at Mahasarakham University (MSU) Thailand, to examined user expectations and perceptions of library service quality. The survey focused on three services areas : a) circulation; b) reference; and c) computer information service. The instrument is a Thai translation of the SERVQUAL instrument as adapted by Danuta Ann Nitecki for use in academic libraries. A follow-up survey of library staff based on the findings of the SERVQUAL instrument was developed by the researcher to prioritize actions for service improvement. The subjects of this study consisted of 582 graduate students, 84 faculty members of Mahasarakham University, and 25 professional library staff members.

Presently, academic libraries in Thailand have faced the same situations as most academic libraries in the world such as money cutback, digital environment, and have to involve in some form of evaluation caused by the policy of the educational quality assurance. The library managers have to seek the better way to improve the service quality in order to survive and derive user's loyalty.

Concept of Service quality for Library assessment

Service quality was defined in different ways but for the concept of service quality that use for library evaluation is " *to examine the difference between a customer's expectations and the customer's perceived sense to actual performance*."

(*Calvert, 2001)* Philip J. Calvert and Peter Hernon also mentioned that :

> "*Most typically, service quality is defined in terms of reducing the gap between user expectations and actual service provided* " (*Philip J. Calvert and Peter Hernon, 1997*)

Though there is ambiguity between the concept of service quality and satisfaction, Peter Hernon concluded that " *service quality focuses on the interaction between customers and service providers, and the gap or difference between expectations about service provision and perception about how the service was actually provided. Satisfaction, on the other hand, does not involve gap analysis*" (*Peter Hernon, 2002*)

According to Philip Calvert (*2001*), the precursors o service quality can be configured as follows:

The customer
1. past experience of the customers:
2. word-of-mouth from other customers:
3. personal needs of the customer: and
4. national culture of the customer:

The service provider:
5. Communications (direct and indirect) about what the customer can expect.

Competitors:
6. service provided by other providers that acts as a benchmark.

Related Research

According to literature review of Surithong Srisa-ard's doctoral dissertation, the article " *Measuring Service Quality at Yale University's Libraries* " written by Danuta A. Nitecki and Peter Hernon as well as database searching (*Dissertation Abstracts, EbscoHost Service, ScienceDirect , Ingenta, LISA ,and web search*) , the researchers in the field of library and information science used a modification of SERVQUAL as an alternative instrument for shifting the way of assessing library service quality. Surithong Srisa-ard mentioned that :

> " *Library researchers have begun to use the SERVQUAL in their own studies. Reviewing the literature on the SERVQUAL, Nitecki (1995) found that by 1994 it had been introduced explicitly to the library field through at least four empirical studies undertaken in public, special, and academic libraries and through three descriptive articles about service quality"*

The former research results revealed the useful findings that provide the intellectual background for the present study as the followings :

SERVQUAL Dimensions in Library setting

The research results from Danuta A. Nitecki's doctoral dissertation (*1995)* was shown that among the 5 dimensions of SERVQUAL, the users rated reliability was most important and tangibles was least important. This finding is parallel to those of Surithong Srisa-ard's (*1997*) , Fawz S. Abdallah 's *(2002)* as well as Ford's (*1994*) which found that the users reported the high expectation on reliability. On the contrary, the findings from the research project of Seay, Seaman and Cohen (*1996*)

was shown that tangibles and reliability were the key concerns of library patrons. Anyway, most findings reflected that reliability is the most important quality in evaluating library services that is similar to the result which the designers of SERVQUAL proposed.

For the number of SERVQUAL dimensions , there are empirical research which examined dimensions of SERVQUAL instrument. To test the data of user expectations by factor analysis, Nitecki's data, however, suggest a three-factor relationship among the 22 SERVQUAL items rather than the five collapsed dimensions which the scale's designers identify from other applications. As literature review of Nitecki and Hernon in the article "*Measuring Service Quality at Yale University's Libraries* " , the point of view of researchers cited in the review can be concluded that " *there may be three dimensions in libraries, tangibles, reliability or service efficiency , and affect of service, and that there is a need for further research to explore the dimensions* " that may underlie quality service as a construct in the research library setting. " (*Nitecki& Hernon, 2000)*

The dimensions of the LibQUAL+

In October 1999, LibQUAL+ was developed to be a tool for library service quality assessment by the Association of Research Libraries (ARL). This new tool is a derivative of the SERVQUAL protocol. Through the LibQUAL+. The dimensions of the tools are as the followings :

Affect of Service : it collapses three of the service dimensions identified by SERVQUAL into one. These dimensions are *Assurance, Empathy*, and *Reliability.*

Reliability : Ability to perform the promised service dependably and accurately.

Access to Information : the access was ensured through the provision of comprehensive collections and ubiquity of access or the provision by all means possible of barrier-free access to information at the time of need.

Library as Place : the ability to meet community requirements for utilitarian space for study, collaboration, or rendezvous.

The concept about Library as Place is oftentimes especially important for undergraduates whose options are more limited than graduate students and faculties

Self-reliance : the ability to foster self reliant information seeking behavior through instruction, mentoring, signage and other means.
(Colleen Cook, et al.,2001)

Users' Expectation Examination Related to National Culture

Philip J. Calvert (*2001*) studied the customer expectations in the comparative research project " *International Variations in Measuring Customer Expectations* " which examined the expectation between the library users in New Zealand and China. (library and information studies (LIS) students at Peking University in China and Victoria University of Wellington in New Zealand) The data suggested that " *academic library users have very similar expectations of services*" Three dimensions that concern staff attitudes, the library environment, and services that help the customers to find and use the library's material efficiently are found in both studies. Remarkably, the users from both countries prefer to work on their own without personal contact. The library should make its service readily available when

the customer wants them, and offering the collection in good order that matches the customer's need. The result from the secondary project which examined the user attitudes of both countries revealed that national culture does not seem to be a major precursor of attitudes to service quality.

Related Research in Thailand

Surithong Srisa-ard (*1997*) used the modification of SERVQAUL to assess the user expectations and perceptions in three service areas (circulation, reference and computer information service) at the Academic Resource Center (AREC) library at Maharakham University (MSU) in the fall of 1996 and the spring of 1997. First, samples were the faculty and graduate students of MSU were asked to complete a Thai translation of SERVQUAL instrument as modified by Nitecki (1995).Second, all librarians and staff members of AREC were asked to complete an accompanying questionnaire, designed by the researcher to interpret the survey results in terms of the priority actions they suggest for the improvement of services of AREC library users. This study is the only one SERVQUAL replication applied with academic library service quality assessment in Thailand so the findings are useful for being an intellectual background for the present study but there are some differences between the two research projects in detail as shown in the following table :

characteristics	Surithong Srisa-ard's	The present study
• The services covered in the studies	• Circulation, reference, computer information service	• Overall services
• Samples	• Graduate students, faculty members, and library staff	• Undergraduate, graduate students, and faculty members/researchers
• SERVQUAL model	• 3 sections : Section A: two column format questionnaire (expectations and perceptions) with 22 statements, Section B: To ask the users to allocate 100 point among 5 dimension ,and Section C : To ask the users to indicate the most and least important dimensions	• Three column format (minimum service adequacy, expectations, and perceptions) with 29 statements which complete by all respondent groups

The findings can be summarized into the following aspects :

On most of the SERVQUAL statements, user expectations for service quality lagged behind user expectations of actual service quality. When looking at the size of the expectation-perception gaps, faculty members appeared to desire improvements in the updating of equipment and in the promptness, sincerity , knowledge-ability, and degree of understanding with which staff assist users. Graduate students had the same concerns, though they are generally more critical of the library in terms of the number of SERVQUAL statements for which mean expectation rating exceeded mean perception ratings. Unlike the faculty, students indicated that their expectations for physical facilities, the visual appearance of library materials, the neatness of employees, operating hours and the personal attention staff give to users were not met. Among 5 dimensions of service quality, the findings suggested that the AREC library users place a premium on the non- tangible aspects of service, particularly reliability and responsiveness.

For conducting the research in Thai context, Surithong Srisa-ard found some interesting aspects such as the much difference of treatment that library staff did between faculty members and students , as well as the different interpretation with some statements in SERVQUAL.

SERVQUAL Questionnaire of the Present Study

For the present study, the modification of SERVQUAL questionnaire used in 2 universities in Japan (1 national, 1 private) , and one university each in England and Finland was adopted . The SERVQUAL questionnaires .(see Appendix A) were distributed to each respondent group of Thammasat University Library System. The users were asked to complete the questionnaires with three levels of services : minimum service , desired service, and perceived service. There are 7 point-scale and 29 statements are arranged at random.

Chapter 3

Methods and Procedures

This chapter explains the methods used in carrying out the study, giving special emphasis to the treatment and techniques used to analyze data. This survey was conducted at one of the most important academic library system in Thailand, Thammasat University Library System during August 20 – October 10, 2002. The randomly selected respondents were asked to complete the modification of SERVQUAL questionnaires. A pretest was managed to make the statements understandable in Thai context. Data was gathered over 6 weeks and the second copy of questionnaires were mailed to the non-respondents who are lecturers. After that data was gathered and treated properly. The regulations were set to validate data treatment.

This chapter explains the procedures, instrumentation, sampling, data treatment, data analysis and techniques used in conducting research.

Instrumentation

The selected sample groups were asked to complete the SERVQUAL instrument (Appendix A). The instrument is divided into 2 sections. The first one asked about background information such as personal information, major subject area, faculties, as well as experience related to using library services. The second one is 29 statement questionnaire which asks users to rate the 3 service levels : minimum service adequacy, desired services, and perceptions of actual service performance which each rating prioritized by 7 point- scale.

The SERVQUAL instrument was translated into Thai by the researcher. For the validation of the translation, Miss Yoopin Claymon , a specialist researcher and linguist of the East Asian Studies Institute, Thammasat University checked for the meaning and commented some statements that give ambiguous meanings. After that, the edited version was re-examined by a lecturer of Department of Thai Language for giving comment for language usage

As pretest, The Thai version of SERVQUAL instrument was completed by 4 lecturers, 1 researcher, and 3 students of Thammasat University. Some services specified in the statements have to be giving more detail such as statements no. 12 " Timely document delivery " and no. 16 " Access to digital collections from PC". The researcher added more detail in those statements such as what are "Document delivery " and " Digital Collections " as the result from a pretest shown that some users exploited those services but don't realize the technical terms used. . To avoid misunderstanding while filling the questionnaire as the three column format SERVQUAL model was quite new to Thai respondents, an instruction sheet was attached with the copy of mailed instrument.

Sampling and Response Rates

The Samples

The samples in this study are the four groups of users of Thammasat University Library System at Prachand and Rangsit Campus. The name list of student samples (undergraduate and graduate students) were prepared by the programmer of

the Office of the Registrar through a computer random sampling. For faculty and researcher samples, the researcher prepared from " Thammasat Directory 2002" .Only the researcher samples , the complete survey was used. The representative samples of 2,139 users from each groups of users were targeted for participation in this study. The detail for sampling of each selected groups is shown in Table 3.1

Table 3.1
Sampling Methods

Selected Sample Groups	Methods
Students (Graduate and Undergraduate)	Computer Random
Faculty members	Lottery Method
Researchers **	Complete survey

** As there are only 24 researchers belong to Thammasat University

The Returned Questionnaires from Each Respondent Groups

The 2,139 printed questionnaires were distributed to the 4 groups of sample users by mail (both campus mail and Thai mail with postage provided) during August 20 – October 10, 2002 . A total of 661 usable questionnaires were received. The overall response rate was 30.90 % that can be summarized in the table 3.2

Table 3.2
Returned by Each Respondent Groups

Respondent groups	Delivered	Returned	% Returned
Undergrad. Student	824	266	32.28
Grad. Student	664	165	24.84
Faculty	627	216	34.45
Researchers	24		45.83
		11	
Unknown	0	3	0.00
Total	**2,139**	**661**	**30.90**

Data Treatment

After gathering the questionnaires , the survey data was key in Excel file. Before transferring to SPSS version 11.0,the following procedures of data treatment were set to validate the data for further analysis :
The processes of checking error :
1. Checking error because of wrong input.
- Check data input by comparing with the original copies of questionnaires.

- Correct the wrong records.

2. Checking the gap differences among the following sections:

- **DEs (Desired service) - MEs (Minimum service)** which is called "Zone of Tolerance" (The area between minimally acceptable and desired service quality rating) . DEs must be higher than MEs or can be at the same level. If the value in DEs is minus, it means erroneous occurrence caused by the response in the MEs section is higher than DEs.

- **Ps (Perceived service) - MEs (Minimum service)** If values from P1-29 – ME1-29 are all 0s , it means the values in each section are the same so that record has to be checked and modified if necessary.

- **Ps (Perceived service) - DEs (Desired service)** The gap difference between these two sections will help the administrators to provide excellent services so if the values from Ps – DEs are all 0s or too much gap difference , the record has to be checked and modified if necessary.

** If the response in any record is blank , it means the following cases appear in either section : 1. duplicate answers (9) 2. no reply (0) or 3. No comment (N=8) in P section

The errors mentioned above have to be modified. Thus, the following regulations were applied for survey data modification :

Regulation for Survey Data Modification

1. If all of the values (ME1-29, DE1-29, and P1-29) are same, then delete this answer.
   Example :
   ME1-29   77777777777777777777777777777
   DE1-29   77777777777777777777777777777
   P1-29   77777777777777777777777777777

2. If the values in MEs and DEs are same, then change ME1-29 to 9 and keep DE1-29 without modification.
   ME1-29   77777777777777777777777777777
   DE1-29   77777777777777777777777777777
   P1-29   76547654125785643725864555543

3. If the values in each section (MEs, DEs, and Ps) are same, then delete this answer.
   ME1-29   11111111111111111111111111111
   DE1-29   77777777777777777777777777777
   P1-29   44444444444444444444444444444

4. If the zone of tolerance (DE – ME) is negative, then counterchange DE and ME .
   ME1 6   -> 4
   DE1   4   -> 6

Characteristics of Sample Groups

Of 661 respondents , more than a half are female (63%) (see Table 3.3) and the majorities of the respondents are students : undergraduate 40.2% and graduate students 25 % (see Table 3.4)

Table 3. 3
Sex of the Respondents

	Frequency	Valid Percent
female	411	63.0
male	241	37.0
Total	652	**100**
unknown	9	
Total	**661**	**100**

Table 3.4
Categories of Respondent Groups

	Frequency	Valid Percent
Undergraduate Student	266	40.2
Graduate Student	165	25.0
Faculty/Researcher	228	34.5
Unknown	2	.3
Total	**661**	**100**

For graduate students, most are studying in the master degree level (93.9%) but for the undergraduate, the proportions of each year are slightly different. (see Table 3.5 and 3.6).

Table 3.5
Categories for Graduate Students

	Frequency	Valid Percent
Master degree	155	93.9
Doctoral degree	4	2.4
Diploma	6	3.6
Total	**165**	**100**

Table 3.6
Categories for Undergraduate Students

	Frequency	Valid Percent
1st year	79	29.7
2nd year	58	21.8
3rd year	51	19.2
4th year	70	26.3
5th year	7	2.6
6th year	1	.4
Total	**266**	**100**

For lecturer/ researcher respondents, nearly half (48.7%) have academic positions as "Lecturer" and the rest indicated their academic positions as " Assist. Professor" and " Assoc. Professor ". There are only 24 researchers belong to TU so it is not surprising that the proportion of researcher respondents is only 4.8% (see Table 3.7). For age groups of lecturer/researcher groups, over half fell into the categories " 26-35 year old and 36- 45 year old " which reflected 60. 4% of all and only 3.1 % indicated the category " less than 25 ". (see Table 3.8) . For consideration in terms of academic positions and age groups, it seems that most lecturer and researcher respondents are new generation which maybe associate with library remote access.

Table 3.7
Categories for Faculty/Researcher

	Frequency	Valid Percent
Lecturer	111	48.7
Assist. Prof.	67	29.4
Assoc. Prof.	39	17.1
Researcher	11	4.8
Total	**228**	**100**

Table 3.8
Age Groups (Faculty/Researcher**)**

	Frequency	Valid Percent
less than 25 yrs.	7	3.1
26-35 yrs.	68	30.2
36-45 yrs.	68	30.2
46-55 yrs.	60	26.7
more than 55 yrs.	22	9.8
Total	**225**	**100**

As most subject-based service provided by Thammasat University cover social science and humanities area so more than half of respondents indicated their major subject areas as social sciences (48.5%) and humanities (20.8%) (see Table 3.9)

Table 3.9
Major Subject Areas

	Frequency	Valid Percent
Humanities	136	20.8
Social Science	317	48.5
Science	77	11.8
Engineering	48	7.4
Health Science	63	9.6
Others	10	1.5
duplicate answer	2	.3
Total	653	100
Unknown	8	
Total	**661**	**100**

Pridi Bhanomyong Library which is the main library at Prachan Campus and Faculty libraries are the two most frequently used libraries. Over half of respondents (70.3 %) have used these libraries as the important learning resources. (see Table 3.10) It is an interesting point as the data suggests that faculty libraries are also the important resources for TU community.

Table 3.10
Library (most frequently use)

	Frequency	Valid Percent
TU Library, Rangsit Campus	170	25.9
Pridee Phanomyong Library	230	35.1
Faculty Libraries	231	35.2
duplicate answer	25	3.8
Total	656	100.0
Unknown	5	
Total	**661**	**100**

For the frequency of library use, over a half of samples have used the libraries frequently. There are only 8.6 % fall into the category " 1 or less for three months " (see Table 3.11) On the contrary, about half of the samples (50.9 %) indicated that they never use library remote service (Table 3.12). It means that most samples accessed the libraries' buildings directly. Actually, TU Library System has provided remote access service for Online Public Access Catalog System (OPAC) and digital collections but the data suggests that the proportion of remote users is still low.

Table 3.11
Frequency of Library use

	Frequency	Valid Percent
2 or more times a week	218	33.3
once every 2 or 3 weeks	110	16.8
1 or less for three months	56	8.6
once a week	171	26.1
once a month	99	15.1
Total	654	**100**
Unknown	7	
Total	**661**	**100**

Table 3.12
Frequency of remote use of all users

	Frequency	Valid Percent
2 or more times a week	60	9.3
once every 2 or 3 weeks	52	8.0
1 or less for three months	85	13.1
once a week	62	9.6
once a month	59	9.1
never	330	50.9
Total	648	100
Unknown	13	
Total	**661**	

For frequency of remote use by individual user group, about a half of each user group use remote access while the percentage of the most frequent use (2 or more times a week) is very low (see Table 3.13 – Table 3.15). It is interesting that the percentage of non user in graduate student group (which most are young generation) is more than a half (59.1%) (see Table 3.14). For undergraduate student group, it seems that they access remote service more often than other groups do. (see Table 3.15)

Frequency of remote use by individual user group
Table 3.13
Facutly/Researcher

	Frequency	Valid Percent
2 or more times a week	18	8.2
once every 2 or 3 weeks	22	10.0
1 or less for three months	33	15.0
once a week	27	12.3
once a month	22	10.0
never	98	44.5
Total	220	100.0
Unknown	8	
Total	**228**	

Table 3.14
Graduate Students

	Frequency	Valid Percent
2 or more times a week	7	4.3
once every 2 or 3 weeks	8	4.9
1 or less for three months	26	15.9
once a week	8	4.9
once a month	18	11.0
never	97	59.1
Total	164	100.0
Unknown	1	
Total	**165**	

Table 3.15
Undergraduate students

	Frequency	Valid Percent
2 or more times a week	35	13.3
once every 2 or 3 weeks	22	8.3
1 or less for three months	26	9.8
once a week	27	10.2
once a month	19	7.2
never	135	51.1
Total	264	100.0
Unknown	2	
Total	**266**	

Number of Respondents Compared with Total TU Library Users

  To compare the number of respondents with total library users of TU Library System, the respondents are 2.37 % of the total users (faculty member, researcher, graduate and undergraduate student). The highest proportion is researcher group as there are only 24 researchers belong to TU. For faculty member group, the data reflects 17.79% of all. For graduate and undergraduate groups, the data reflects 2.58 % and 1.36% respectively. (see Table 3.16)

Table 3.16
Number of selected respondents compare with total TU population
(Based on information of the year 2002)

Types of Population	Population	Respondents	%
Faculty	1,220	217	17.79
Researcher	24	11	45.83
Graduate student	6,396	165	2.58
Undergraduate student	20,261	266	1.36
Unknown		2	
Total	**27,901**	**661**	**2.37**

  In the present study, the percentage of faculty respondent group compare with faculty population is 17.79% (see Table 3.17) and it is not surprising that most respondents (48.7%) have academic position as "Lecturer" because " Lecturer" position occupied 51.7% of all TU lecturers. (Thammasat University Yearbook 2002, 52)

Table 3.17
Academic position of faculty respondents compare with total faculty population
(Based on information of the year 2002)

Academic position	Total no.(%)	No. of Respondents/%	%
Professor	14 (01.1%)	00(00.0%)	00.00
Associate Prof.	229(18.8%)	39(17.1%)	17.03
Assistant Prof.	346(28.4%)	67(29.4%)	19.36
Lecturer	631(51.7%)	111(48.7%)	17.59
Total	**1,220(100%)**	**217(100%)**	**17.79**

The Frequencies of User Responses for Each Level of Service

The frequencies of user responses for each level of service are shown in Table 3.18 – Table 3.20. All attributes are ranked respectively by missing value as it will be supported information when doing data analysis. It is interesting that, most higher orders of missing values in each level are very similar and most attributes are related to staff attributes. It is possible that some respondents seldom contacted library staff , don't use reference services, or don't ask reference questions in order to find needed information when they accessed library services so highly missing values are occurred in "Actual service perceptions" related to staff attributes. The respondents leave blank in the attributes " Providing service as the promise time" " Performing services right the first time" " Dependability in handing user's questions" " Library staff with the knowledge to answer user's questions ", etc.. (see Table 3.20) because they don't know how to evaluate library staff. The missing values of Minimum Service and Desired Service perceptions (see Table 3.18 and Table 3.19) are less than those in Actual Service Perceptions because the respondents can expect what they want, though they don't experience in their real usage. For the attributes " Timely document delivery " and "Access to digital collections from PC " which are appeared at the top five of every level, it is possible to conclude that the respondents never use or don't know that these 2 services are available. The data is associated with the number of the respondents who access library remote service. About half of the respondents (50.9%) have never used it. (see Table 3.12).

Table 3.18
Frequency of User Responses for Minimum Service Expectation (Ranked by missing value)

Order	Statements	N Valid	Missing	Mean	Median	Mode	SD
1	Timely document delivery	589	72	4.51	5	5	1.09
2	Providing services at the promised time	592	69	4.60	5	5	1.12
3	Performing services right the first time	604	57	4.65	5	5	1.16
4	Access to digital collections from PC	606	55	4.49	5	5	1.24
5	Providing services as promised	610	51	4.63	5	5	1.15
6	Instruction in use and/or training sessions, when needed	610	51	4.39	4	5	1.20
7	Readiness to respond to user's questions	613	48	4.55	5	4	1.19
8	Library staff with the knowledge to answer user's questions	614	47	4.81	5	5	1.19
9	Dependability in handling user's service problems	614	47	4.67	5	5	1.09
10	Keeping users informed about when services will be performed	617	44	4.70	5	4	1.15
11	Assuring users of the accuracy and confidentiality of their personal information/data	619	42	4.96	5	5	1.22
12	Library staff who understand the needs of their users	622	39	4.61	5	5	1.18
13	Library staff who instill confidence in users	623	38	4.42	5	5	1.14
14	A place for reflection and creativity	623	38	4.88	5	5	1.21
15	Giving users individual attention	625	36	4.33	4	4	1.14
16	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	625	36	4.40	4	4	1.17
17	Expect to find information and new ideas	625	36	4.77	5	5	1.23
18	Modern equipment	626	35	4.62	5	5	1.13
19	Willingness to help users	628	33	4.73	5	5	1.18
20	Space that enables quiet study	629	32	4.97	5	5	1.19
21	Library staff who deal with users in a concerned or considerate fashion	629	32	4.71	5	5	1.14
22	A comfortable and inviting location	632	29	4.56	5	5	1.11
23	Convenient access to library collections	632	29	4.60	5	5	1.09
24	Prompt service to users	632	29	4.50	5	5	1.09
25	Convenient opening hours	633	28	4.61	5	5	1.12
26	Library staff who are always courteous	633	28	4.55	5	5	1.14
27	Availability of required information	635	26	4.52	5	5	1.02
28	Having the users' best interests at heart	638	23	4.58	5	5	1.12
29	Visually appealing facilities	638	23	4.53	5	5	1.11

Table 3.19
Frequency of User Responses for Desired Service Expectation
(Ranked by missing value)

Order	Statements	N Valid	Missing	Mean	Median	Mode	SD
1	Timely document delivery	596	65	5.84	6	6	0.98
2	Providing services at the promised time	597	64	5.90	6	6	0.95
3	Access to digital collections from PC	610	51	5.89	6	6	1.06
4	Performing services right the first time	610	51	5.99	6	6	0.99
5	Providing services as promised	615	46	5.97	6	7	0.99
6	Instruction in use and/or training sessions, when needed	615	46	5.71	6	6	1.07
7	Library staff with the knowledge to answer user's questions	618	43	6.15	6	7	0.93
8	Readiness to respond to user's questions	618	43	5.96	6	6	1.00
9	Dependability in handling user's service problems	620	41	5.95	6	6	0.96
10	Keeping users informed about when services will be performed	623	38	5.91	6	6	0.98
11	Assuring users of the accuracy and confidentiality of their personal information/data	625	36	6.14	6	7	0.96
12	Library staff who understand the needs of their users	627	34	5.95	6	6	1.00
13	Library staff who instill confidence in users	629	32	5.84	6	6	0.95
14	A place for reflection and creativity	629	32	6.30	7	7	0.87
15	Modern equipment	631	30	6.00	6	6	0.97
16	Giving users individual attention	632	29	5.65	6	6	1.06
17	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	632	29	5.76	6	6	1.06
18	Willingness to help users	634	27	6.10	6	7	0.95
19	Prompt service to users	635	26	6.03	6	6	0.96
20	Library staff who deal with users in a concerned or considerate fashion	635	26	6.09	6	6	0.95
21	Convenient opening hours	636	25	6.04	6	6	0.90
22	Convenient access to library collections	636	25	6.13	6	6	0.89
23	Space that enables quiet study	636	25	6.32	7	7	0.86
24	Expect to find information and new ideas	636	25	6.16	6	7	0.97
25	Library staff who are always courteous	638	23	5.97	6	6	0.96
26	Visually appealing facilities	640	21	6.09	6	6	0.96
27	Availability of required information	641	20	6.08	6	6	0.88
28	A comfortable and inviting location	641	20	6.02	6	6	0.90
29	Having the users' best interests at heart	642	19	6.02	6	6	0.97

Table 3.20
Frequency of User Responses for Actual Service Perceptions
(Ranked by missing value)

Order	Statements	No. Valid	Missing	Mean	Median	Mode	SD
1	Timely document delivery	477	184	4.64	5	5	1.14
2	Providing services at the promised time	522	139	4.96	5	5	1.16
3	Access to digital collections from PC	523	138	4.36	4	4	1.42
4	Instruction in use and/or training sessions, when needed	548	113	4.46	4	4	1.35
5	Performing services right the first time	562	99	4.92	5	5	1.23
6	Dependability in handling user's service problems	570	91	4.90	5	5	1.20
7	Readiness to respond to user's questions	574	87	4.80	5	5	1.28
8	Providing services as promised	575	86	4.77	5	5	1.17
9	Library staff with the knowledge to answer user's questions	579	82	5.17	5	5	1.17
10	Library staff who understand the needs of their users	581	80	4.62	5	5	1.32
11	Keeping users informed about when services will be performed	585	76	5.03	5	6	1.31
12	Expect to find information and new ideas	595	66	4.82	5	5	1.23
13	Library staff who instill confidence in users	598	63	4.73	5	5	1.19
14	Assuring users of the accuracy and confidentiality of their personal information/data	600	61	5.28	5	6	1.33
15	Giving users individual attention	615	46	4.52	5	4	1.33
16	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	617	44	4.71	5	5	1.31
17	Willingness to help users	619	42	4.90	5	5	1.40
18	Library staff who deal with users in a concerned or considerate fashion	622	39	4.85	5	5	1.35
19	A place for reflection and creativity	623	38	4.91	5	5	1.37
20	Modern equipment	625	36	4.96	5	5	1.14
21	Library staff who are always courteous	634	27	4.84	5	5	1.30
22	Prompt service to users	635	26	4.77	5	5	1.26
23	Space that enables quiet study	635	26	5.02	5	6	1.34
24	Having the users' best interests at heart	638	23	4.83	5	5	1.33
25	Convenient opening hours	639	22	5.18	5	6	1.23
26	Convenient access to library collections	641	20	5.02	5	5	1.23
27	Availability of required information	642	19	4.73	5	5	1.17
28	A comfortable and inviting location	643	18	5.27	5	6	1.23
29	Visually appealing facilities	647	14	4.95	5	5	1.30

The orders of missing values among 3 levels are not too different as shown in Table 3.21. Each missing values are in neighboring order so it is possible that if the respondents don't experience in any attributes, they leave them blank in the level of "Actual service perceptions" and tend to do in the similar way for the rest levels.

Table 3.21
Comparison of the orders of missing values among 3 levels of quality service expectations

Order of Missing Values			Statements
DE	ME	P	
1	1	1	Timely document delivery
2	2	2	Providing services at the promised time
3	4	3	Access to digital collections from PC
6	6	4	Instruction in use and/or training sessions, when needed
4	3	5	Performing services right the first time
9	9	6	Dependability in handling user's service problems
8	7	7	Readiness to respond to user's questions
5	5	8	Providing services as promised
7	8	9	Library staff with the knowledge to answer user's questions
12	12	10	Library staff who understand the needs of their users
10	10	11	Keeping users informed about when services will be performed
24	17	12	Expect to find information and new ideas
13	13	13	Library staff who instill confidence in users
11	11	14	Assuring users of the accuracy and confidentiality of their personal information/data
16	15	15	Giving users individual attention
17	16	16	Visually appealing materials (such as pamphlets, statements or signs) associated with the service
18	19	17	Willingness to help users
20	21	18	Library staff who deal with users in a concerned or considerate fashion
14	14	19	A place for reflection and creativity
15	18	20	Modern equipment
25	26	21	Library staff who are always courteous
19	24	22	Prompt service to users
23	20	23	Space that enables quiet study
29	28	24	Having the users' best interests at heart
21	25	25	Convenient opening hours
22	23	26	Convenient access to library collections
27	27	27	Availability of required information
28	22	28	A comfortable and inviting location
26	29	29	Visually appealing facilities

Statistical Method and Techniques Used for Data Analysis

After data treatment, the data was transferred to SPSS Version 11.0 and do statistical analysis in order to accomplish the purposes of the study. The data will be analyzed in the following ways. First, to elicit in what way the TU Library System provided service to its users, the gap discrepancy between desired service and actual service performance will be calculated and ranked respectively.

Second, to examine in what way TU Library System provided service to its individual group of user, the gap discrepancy between desired service and actual service performance will be calculated by individual group of users and ranked respectively. This result can suggest what service meet, exceed or fall short into the user expectations.

Third, to investigate which dimensions that determine the customers' evaluation of service quality in TU Library System, factor analysis will be applied. The data will be useful for the library managers in terms of management the service planning what they should do urgently.

Fourth, to investigate which are the most essential attributes that library manager should allocate the resource for good service quality, the "Zone of Tolerance" which is the range between desired service expectation and minimum service adequacy will be calculated.

Finally, the open-ended questions will be categorized, counted, and ranked respectively as the data will suggest what problems the users encountered when they involved in library service.

Chapter 4
Data Analysis

To assess the service quality of TU Library system, the adaptation of SERVQUAL questionnaires were distributed to the target groups by mail. The respondents were asked to rate each attribute of service quality 3 times in the three columns : minimum service level , desired service level , and perception of actual service level. The scales used were 7 point scale which ordered from 1"lowest " to 7 " highest " .

This chapter reports the study results which will answer the 6 research questions. The 7 research questions are as the followings :

1. In what ways do TU Library System provide service to its users ?

2. By individual group of users, in what ways do TU Library System provide service to its users?

3. By individual group of users, which attributes of service quality equal, exceed or fall short user perceptions ?

For these 3 research questions, the gap difference between desired service level and actual service perceptions as well as a paired sample t-test will be calculated.

4. By individual group of users, in what way do the users expect for excellent service quality from TU Library system ?

The means of desired service expectations will be ranked and compared among 3 groups of users.

5. What are the dimensions that determine the customers' evaluation of service quality of TU Library System?

Factor analysis methods will be applied to investigate the dimensions of service quality. The results can be supported information for the library managers to convert the theory into practical resources allocation decisions (Philip J. Calvert, 2001)

6. What are the most essential attributes that library managers should allocated the resources to support for improving excellent service quality?

The " Zone of Tolerance " which is the range between desired service expectation and minimum service expectation will be calculated to find such attributes.

7. What problems did the users encounter when involved in library services?

To investigate the problems users encountered when involved in library service, the open ended comments will be counted and classified by categories.

<u>What are the gaps between user desired service expectations and actual service perception ?</u>

As the gap discrepancy between desired service expectation and perception of actual service is the key concept of service quality so the gaps difference between the two levels of service expectations were calculated and ranked order by gap size.

The result from Table 4.1 reveals that all attributes of service quality don't meet the users' expectations. The reason is like Surithong Srisa-ard mentioned in her doctoral thesis :

"It is natural tendency of people to wish for more than they have "

The larger gaps are the attributes that related to materials, study environment and staff attributes. The result reflects that the attributes related to dimensions " Collection & Access " and "Library as Place " occupied among the top five ranking. The gap differences related to staff attributes (Empathy & Responsiveness) are ranked respectively behind the " Collection & Access" and " Library as Place". It seems that "Tangibles" dimension is not problematic as the gap rank is quite low. It is interesting that the attribute "A comfortable and inviting location" is at the lowest rank which is contradictory to the aforementioned ranking. It seems that the libraries are comfortable and inviting but too noisy and don't have enough space for quiet study.

For the attribute related to " Reliability " dimension, the most problematic attribute is " Providing services as promise", For the rest attributes, the gaps are not too large.

Table 4.1
Gap Difference between Desired Service Expectation and Perceived Service
Expectation (Order by Gap size)

Rank Order By Gap size	Dimensions	Statements	Mean diff.
1	Collection& Access	Access to digital collections from PC	1.58
2	Library as Place	A place for reflection and creativity	1.39
3	Collection & Access	Availability of required information	1.37
4	Collection & Access	Expect to find information and new ideas	1.37
5	Empathy	Library staff who understand the needs of their users	1.33
6	Collection& Access	Instruction in use and/or training sessions, when needed	1.29
7	Library as Place	Space that enables quiet study	1.28
8	Responsiveness	Prompt service to users	1.25
9	Empathy	Library staff who deal with users in a concerned or considerate fashion	1.24
10	Responsiveness	Willingness to help users	1.20
11	Empathy	Having the users' best interests at heart	1.20
12	Reliability	Providing services as promised	1.19
13	Collection & Access	Timely document delivery	1.19
14	Responsiveness	Readiness to respond to user's questions	1.17
15	Empathy	Giving users individual attention	1.16
16	Tangibles	Visually appealing facilities	1.15
17	Assurance	Library staff who are always courteous	1.15
18	Assurance	Library staff who instill confidence in users	1.12
19	Collection& Access	Convenient access to library collections	1.11
20	Reliability	Performing services right the first time	1.07
21	Reliability	Dependability in handling user's service problems	1.06
22	Tangibles	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	1.04
23	Tangibles	Modern equipment	1.04
24	Assurance	Library staff with the knowledge to answer user's questions	0.97
25	Reliability	Providing services at the promised time	0.93
26	Responsiveness	Keeping users informed about when services will be performed	0.89
27	Assurance	Assuring users of the accuracy and confidentiality of their personal information/data	0.87
28	Empathy	Convenient opening hours	0.86
29	Library as Place	A comfortable and inviting location	0.75

<u>By individual group of users, what are the gaps between user desired service expectations and actual service perception ?</u>

The result reveals that by individual group of user, all desired service expectations are lagged behind the actual service perception. (see Table 4.2, 4.4 and 4.6) When the gap sizes were ranked by order, there are similarities between faculty/researcher group and graduate student group (see Table 4.3 & Table 4.5) The ranks of gap differences for dimensions " Collection &Access" and "Library as Place " are at the top five. On the contrary, for undergraduate student group, the dimensions related to library staff attributes ("Responsiveness ", " Empathy", and "Assurance") are at the top five.

For faculty/researcher group and graduate student group, the largest gap is the same attribute "Access to digital collection from PC " and the top five gaps are very similar. If we consider the frequency of remote access use of these 2 groups, a half of the respondents never use remote access service (see Table 3.12) and by individual group, about a half of each group never use remote access either (see Table 3.13 – Table 3.15) This result can be anticipated in many ways such as most users have to access digital collection within library building, never use this service at all, or don't know that the services are available.

For the attributes that related to staff attributes, it is interesting that in the perspectives of each user group the rank are different. For faculty/researcher group, the gap differences are not too large and most are at the low rank. (see Table 4.3) For graduate student group, the staff attributes are ranked behind the physical attributes : especially the dimension "Empathy" (see Table 4.5) For undergraduate group, it seems that the gap differences are larger than those of other groups.(see Table 4.7) Anyway, in the perspectives of undergraduate student group, the dimension " Library as Place "and " Collection&Access" are problematic as they are ranked at the higher orders and the gap differences are large. It seems library staff treat the faculty/researcher different from students.

Table 4.2
Faculty/Researcher (t-test)

Statements	Expectation Score Mean	SD	Perception Score Mean	SD	Mean Diff.	t
1.Availability of required information	6.07	0.91	4.81	1.17	1.26	13.42*
2.Convenient opening hours	6.01	0.89	5.15	1.32	0.86	8.40*
3.A comfortable and inviting location	6.01	0.94	5.15	1.24	0.86	8.99*
4.Having the users' best interests at heart	6.08	1.00	5.22	1.19	0.85	9.68*
5.Convenient access to library collections	6.20	0.86	5.16	1.26	1.04	11.04*
6.Prompt service to users	6.00	0.98	5.06	1.27	0.94	10.48*
7.Visually appealing facilities	6.04	1.00	4.87	1.29	1.18	11.29*
8.Library staff who are always courteous	6.12	0.87	5.30	1.15	0.82	9.49*
9.Giving users individual attention	5.81	0.94	4.95	1.27	0.86	8.67*
10.Space that enables quiet study	6.30	0.82	4.94	1.29	1.35	13.76*
11.Modern equipment	6.03	0.94	4.87	1.14	1.16	11.91*
12.Timely document delivery	6.02	0.81	4.81	1.12	1.21	10.78*
13.Keeping users informed about when services will be performed	6.05	0.95	5.18	1.30	0.87	8.37*
14.Assuring users of the accuracy and confidentiality of their personal information/data	6.23	0.87	5.41	1.29	0.82	8.67*
15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	5.91	0.99	4.67	1.26	1.25	12.26*
16.Access to digital collections from PC	6.17	0.94	4.47	1.48	1.70	12.84*
17.Providing services as promised	6.05	0.95	4.88	1.16	1.17	11.20*
18.Willingness to help users	6.15	0.90	5.29	1.34	0.86	8.21*
19.Instruction in use and/or training sessions, when needed	5.90	1.02	4.78	1.41	1.13	10.09*
20.Library staff who understand the needs of their users	6.01	0.95	4.87	1.33	1.14	10.29*
21.Library staff who instill confidence in users	5.90	0.97	4.97	1.20	0.93	10.02*
22.Providing services at the promised time	6.02	0.94	5.09	1.13	0.93	9.90*
23.Library staff with the knowledge to answer user's questions	6.18	0.93	5.40	1.15	0.77	9.14*
24.Performing services right the first time	5.98	0.92	5.16	1.15	0.83	8.36*
25.Dependability in handling user's service problems	6.00	0.89	5.08	1.16	0.92	9.53*
26.Expect to find information and new ideas	6.19	0.95	4.84	1.28	1.36	13.22*
27.Readiness to respond to user's questions	6.01	0.97	5.07	1.27	0.94	9.42*
28.A place for reflection and creativity	6.23	0.95	4.75	1.40	1.48	13.36*
29.Library staff who deal with users in a concerned or considerate fashion	6.13	0.90	5.17	1.30	0.95	9.88*

- *** Note** p < . 05

Table 4.3
Gap differences between desired expectations and actual service perceptions
Faculty/Researcher ranked by Gap size

Rank Order by Gap size	Dimensions	Statements	Mean Diff.
1	Collection & Access	16.Access to digital collections from PC	1.70
2	Library as Place	28.A place for reflection and creativity	1.48
3	Collection & Access	26.Expect to find information and new ideas	1.36
4	Library as Place	10.Space that enables quiet study	1.35
5	Collection& Access	1.Availability of required information	1.26
6	Tangibles	15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	1.25
7	Collection& Access	12.Timely document delivery	1.21
8	Tangibles	7.Visually appealing facilities	1.18
9	Reliability	17.Providing services as promised	1.17
10	Tangibles	11.Modern equipment	1.16
11	Empathy	20.Library staff who understand the needs of their users	1.14
12	Collection& Access	19.Instruction in use and/or training sessions, when needed	1.13
13	Collection & Access	5.Convenient access to library collections	1.04
14	Empathy	29.Library staff who deal with users in a concerned or considerate fashion	0.95
15	Responsiveness	6.Prompt service to users	0.94
16	Responsiveness	27.Readiness to respond to user's questions	0.94
17	Reliability	22.Providing services at the promised time	0.93
18	Assurance	21.Library staff who instill confidence in users	0.93
19	Reliability	25.Dependability in handling user's service problems	0.92
20	Responsiveness	13.Keeping users informed about when services will be performed	0.87
21	Empathy	9.Giving users individual attention	0.86
22	Responsiveness	18.Willingness to help users	0.86
23	Library as Place	3.A comfortable and inviting location	0.86
24	Empathy	2.Convenient opening hours	0.86
25	Empathy	4.Having the users' best interests at heart	0.85
26	Reliability	24.Performing services right the first time	0.83
27	Assurance	14.Assuring users of the accuracy and confidentiality of their personal information/data	0.82
28	Assurance	8.Library staff who are always courteous	0.82
29	Assurance	23.Library staff with the knowledge to answer user's questions	0.77

Table 4.4
Graduate Students (t-test)

Statements	Expectation Score	SD	Perception Score	SD	Mean Diff.	t
1.Availability of required information	6.13	0.78	4.69	1.25	1.44	13.15*
2.Convenient opening hours	6.09	0.89	5.02	1.34	1.08	9.05*
3.A comfortable and inviting location	5.94	0.81	5.49	1.13	0.46	4.61*
4.Having the users' best interests at heart	6.04	0.86	4.92	1.27	1.12	10.31*
5.Convenient access to library collections	6.20	0.80	5.11	1.20	1.09	9.83*
6.Prompt service to users	6.04	0.91	4.82	1.29	1.22	10.63*
7.Visually appealing facilities	6.09	0.84	5.10	1.33	0.99	8.28*
8.Library staff who are always courteous	5.88	0.90	4.97	1.17	0.91	8.53*
9.Giving users individual attention	5.70	0.88	4.66	1.24	1.04	9.70*
10.Space that enables quiet study	6.23	0.87	5.26	1.31	0.97	8.31*
11.Modern equipment	5.90	0.92	5.12	1.11	0.78	6.74*
12.Timely document delivery	5.83	0.91	4.63	1.19	1.20	8.58*
13.Keeping users informed about when services will be performed	5.83	1.00	5.14	1.32	0.70	6.32*
14.Assuring users of the accuracy and confidentiality of their personal information/data	6.18	0.85	5.45	1.30	0.72	6.22*
15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	5.72	0.98	4.85	1.33	0.87	7.73*
16.Access to digital collections from PC	5.83	1.08	4.25	1.36	1.58	9.87*
17.Providing services as promised	5.83	0.96	4.93	1.15	0.90	8.46*
18.Willingness to help users	6.03	0.94	5.03	1.31	1.00	8.42*
19.Instruction in use and/or training sessions, when needed	5.57	0.98	4.34	1.35	1.24	9.77*
20.Library staff who understand the needs of their users	5.83	1.00	4.66	1.36	1.17	9.61*
21.Library staff who instill confidence in users	5.83	0.85	4.76	1.17	1.07	9.88*
22.Providing services at the promised time	5.75	0.94	4.93	1.14	0.82	7.33*
23.Library staff with the knowledge to answer user's questions	6.22	0.82	5.17	1.08	1.05	10.11*
24.Performing services right the first time	5.95	0.93	5.02	1.08	0.93	8.63*
25.Dependability in handling user's service problems	5.91	0.87	4.87	1.19	1.04	9.27*
26.Expect to find information and new ideas	6.28	0.87	4.87	1.18	1.41	12.02*
27.Readiness to respond to user's questions	5.95	0.94	4.75	1.28	1.20	9.98*
28.A place for reflection and creativity	6.38	0.78	5.09	1.38	1.29	10.47*
29.Library staff who deal with users in a concerned or considerate fashion	6.04	0.92	4.95	1.29	1.09	9.23*

- ***Note** $p < .05$

Table 4.5
Gap differences between desired expectations and actual service perceptions
Graduate students ranked by gap size

Rank Order by Gap size	Dimensions	Statements	Mean Diff.
1	Collection& Access	16.Access to digital collections from PC	1.58
2	Collection & Access	1.Availability of required information	1.44
3	Collection& Access	26.Expect to find information and new ideas	1.41
4	Library as Place	28.A place for reflection and creativity	1.29
5	Collection & Access	19.Instruction in use and/or training sessions, when needed	1.24
6	Responsiveness	6.Prompt service to users	1.22
7	Responsiveness	27.Readiness to respond to user's questions	1.20
8	Collection& Access	12.Timely document delivery	1.20
9	Empathy	20.Library staff who understand the needs of their users	1.17
10	Empathy	4.Having the users' best interests at heart	1.12
11	Empathy	29.Library staff who deal with users in a concerned or considerate fashion	1.09
12	Collection & Access	5.Convenient access to library collections	1.09
13	Empathy	2.Convenient opening hours	1.08
14	Assurance	21.Library staff who instill confidence in users	1.07
15	Assurance	23.Library staff with the knowledge to answer user's questions	1.05
16	Reliability	25.Dependability in handling user's service problems	1.04
17	Empathy	9.Giving users individual attention	1.04
18	Responsiveness	18.Willingness to help users	1.00
19	Tangibles	7.Visually appealing facilities	0.99
20	Library as Place	10.Space that enables quiet study	0.97
21	Reliability	24.Performing services right the first time	0.93
22	Assurance	8.Library staff who are always courteous	0.91
23	Reliability	17.Providing services as promised	0.90
24	Tangibles	15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	0.87
25	Reliability	22.Providing services at the promised time	0.82
26	Tangibles	11.Modern equipment	0.78
27	Assurance	14.Assuring users of the accuracy and confidentiality of their personal information/data	0.72
28	Responsiveness	13.Keeping users informed about when services will be performed	0.70
29	Library as Place	3.A comfortable and inviting location	0.46

Table 4.6
Undergraduate student (t-test)

Statements	Expectation Score	SD	Perception Score	SD	Mean Diff.	t
1.Availability of required information	6.10	0.87	4.69	1.12	1.41	18.16*
2.Convenient opening hours	6.03	0.88	5.32	1.07	0.71	9.27*
3.A comfortable and inviting location	6.09	0.91	5.24	1.27	0.85	10.28*
4.Having the users' best interests at heart	5.98	1.00	4.44	1.37	1.54	15.92*
5.Convenient access to library collections	6.04	0.96	4.84	1.21	1.19	14.26*
6.Prompt service to users	6.04	0.98	4.50	1.19	1.54	18.26*
7.Visually appealing facilities	6.13	0.96	4.90	1.31	1.23	13.78*
8.Library staff who are always courteous	5.93	1.05	4.36	1.34	1.57	17.26*
9.Giving users individual attention	5.55	1.22	4.08	1.30	1.47	15.74*
10.Space that enables quiet study	6.38	0.90	4.97	1.35	1.41	16.18*
11.Modern equipment	6.02	1.03	4.92	1.16	1.10	13.71*
12.Timely document delivery	5.71	1.05	4.53	1.10	1.17	13.24*
13.Keeping users informed about when services will be performed	5.83	0.98	4.83	1.31	1.00	10.92*
14.Assuring users of the accuracy and confidentiality of their personal information/data	6.09	1.04	5.09	1.35	1.00	11.69*
15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	5.64	1.14	4.67	1.32	0.98	10.34*
16.Access to digital collections from PC	5.84	1.11	4.33	1.40	1.50	14.51*
17.Providing services as promised	5.98	1.02	4.61	1.17	1.37	15.66*
18.Willingness to help users	6.11	1.00	4.51	1.39	1.60	16.96*
19.Instruction in use and/or training sessions, when needed	5.71	1.12	4.26	1.25	1.45	15.14*
20.Library staff who understand the needs of their users	5.98	1.04	4.39	1.24	1.59	17.66*
21.Library staff who instill confidence in users	5.84	0.95	4.54	1.15	1.30	17.44*
22.Providing services at the promised time	5.87	0.99	4.87	1.15	1.00	14.24*
23.Library staff with the knowledge to answer user's questions	6.05	0.99	4.96	1.21	1.10	13.35*
24.Performing services right the first time	6.02	1.04	4.66	1.31	1.35	15.15*
25.Dependability in handling user's service problems	5.94	1.05	4.76	1.21	1.18	14.02*
26.Expect to find information and new ideas	6.11	1.01	4.76	1.23	1.35	15.45*
27.Readiness to respond to user's questions	5.93	1.05	4.59	1.26	1.33	14.43*
28.A place for reflection and creativity	6.31	0.84	4.91	1.33	1.40	15.18*
29.Library staff who deal with users in a concerned or considerate fashion	6.09	1.02	4.52	1.34	1.57	17.01*

- ***Note** p < . 05

Table 4.7
Gap differences between desired expectations and actual service perceptions
Undergraduate students ranked by gap size

Rank Order by Gap size	Dimensions	Statements	Mean Diff.
1	Responsiveness	18.Willingness to help users	1.60
2	Empathy	20.Library staff who understand the needs of their users	1.59
3	Empathy	29.Library staff who deal with users in a concerned or considerate fashion	1.57
4	Assurance	8.Library staff who are always courteous	1.57
5	Empathy	4.Having the users' best interests at heart	1.54
6	Responsiveness	6.Prompt service to users	1.54
7	Collection & Access	16.Access to digital collections from PC	1.50
8	Empathy	9.Giving users individual attention	1.47
9	Collection & Access	19.Instruction in use and/or training sessions, when needed	1.45
10	Collection & Access	1.Availability of required information	1.41
11	Library as Place	10.Space that enables quiet study	1.41
12	Library as Place	28.A place for reflection and creativity	1.40
13	Reliability	17.Providing services as promised	1.37
14	Reliability	24.Performing services right the first time	1.35
15	Collection & Access	26.Expect to find information and new ideas	1.35
16	Responsiveness	27.Readiness to respond to user's questions	1.33
17	Assurance	21.Library staff who instill confidence in users	1.30
18	Tangibles	7.Visually appealing facilities	1.23
19	Collection & Access	5.Convenient access to library collections	1.19
20	Reliability	25.Dependability in handling user's service problems	1.18
21	Collection & Access	12.Timely document delivery	1.17
22	Tangibles	11.Modern equipment	1.10
23	Assurance	23.Library staff with the knowledge to answer user's questions	1.10
24	Reliability	22.Providing services at the promised time	1.00
25	Responsiveness	13.Keeping users informed about when services will be performed	1.00
26	Assurance	14.Assuring users of the accuracy and confidentiality of their personal information/data	1.00
27	Tangibles	15.Visually appealing materials (such as pamphlets, statements or signs) associated with the service	0.98
28	Library as Place	3.A comfortable and inviting location	0.85
29	Empathy	2.Convenient opening hours	0.71

By individual group of users, what are the users' expectations for excellent service quality from TU Library system ?

To examine the desired service expectation by individual user groups, the means of desired service expectations are ranked respectively from highest to lowest. The results reveals that there are some commonalities related to user desired service expectations. The five attributes that all users commonly expected are " Space that enables quiet study" "A place for reflection and creativity" " Expect to find information and new idea" "Library staff with the knowledge to answer user's questions" and " Assuring users of the accuracy and confidentiality of their personal information/data ".

The attributes "Access to digital collections from PC " and " Timely document delivery "are not ranked in the higher order of all users' expectations, though they are the larger gaps from faculty/researcher and undergraduate student groups' perspectives. If we consider from the high number of missing value of these attributes , (see Table 3.20) ,it deems to conclude that the users don't realize their own expectations because they don't have much experience with these services.

The attribute " Giving users individual attention" is ranked very low in all user group expectations. It maybe because the users don't want individual attention from library staff or don't contact library staff when involved in library services.

It is interesting that the attribute "Instruction in use and/or training sessions, when needed" is ranked very low by all users groups.(see Table 4.8 – Table 4.10) It seems that the users want to access library service by their own without mediation or instruction.

Table 4.8
Desired Service Expectation of Faculty/Researcher (Order by Means)

Faculty/Researcher desired expectations

	Statements	Frequency	Missing	Mean	SD
1	Space that enables quiet study	214	14	**6.32**	0.81
2	A place for reflection and creativity	210	18	**6.23**	0.95
3	Convenient access to library collections	217	11	**6.21**	0.86
4	Assuring users of the accuracy and confidentiality of their personal information/data	203	25	**6.21**	0.87
5	Library staff with the knowledge to answer user's questions	205	23	**6.20**	0.92
6	Expect to find information and new ideas	213	15	**6.16**	0.95
7	Willingness to help users	214	14	**6.14**	0.90
8	Library staff who deal with users in a concerned or considerate fashion	214	14	**6.12**	0.90
9	Library staff who are always courteous	215	13	**6.11**	0.86
10	Access to digital collections from PC	201	27	**6.10**	0.96
11	Having the users' best interests at heart	219	9	**6.08**	0.99
12	Availability of required information	215	13	**6.06**	0.90
13	Visually appealing facilities	216	12	**6.06**	0.99
14	Providing services as promised	197	31	**6.04**	0.96
15	Modern equipment	213	15	**6.04**	0.94
16	Providing services at the promised time	193	35	**6.03**	0.93
17	Keeping users informed about when services will be performed	208	20	**6.02**	0.97
18	Convenient opening hours	215	13	**6.02**	0.88
19	Prompt service to users	215	13	**6.01**	0.97
20	A comfortable and inviting location	218	10	**6.01**	0.95
21	Readiness to respond to user's questions	206	22	**6.01**	0.96
22	Library staff who understand the needs of their users	209	19	**6.01**	0.95
23	Timely document delivery	193	35	**5.99**	0.88
24	Dependability in handling user's service problems	207	21	**5.98**	0.88
25	Performing services right the first time	198	30	**5.96**	0.96
26	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	209	19	**5.92**	0.98
27	Library staff who instill confidence in users	211	17	**5.88**	0.98
28	Instruction in use and/or training sessions, when needed	203	25	**5.87**	1.03
29	Giving users individual attention	210	18	**5.79**	0.96

Table 4.9
Desired Service Expectation of Graduate Students (Order by Means)

Graduate Students desired expectations

	Statements	Frequency	Missing	Mean	SD
1	A place for reflection and creativity	160	5	**6.36**	0.80
2	Expect to find information and new ideas	162	3	**6.29**	0.86
3	Space that enables quiet study	160	5	**6.23**	0.86
4	Library staff with the knowledge to answer user's questions	154	11	**6.23**	0.82
5	Convenient access to library collections	159	6	**6.19**	0.80
6	Assuring users of the accuracy and confidentiality of their personal information/data	158	7	**6.15**	0.88
7	Availability of required information	162	3	**6.13**	0.78
8	Convenient opening hours	159	6	**6.09**	0.89
9	Visually appealing facilities	160	5	**6.09**	0.84
10	Prompt service to users	160	5	**6.03**	0.92
11	Library staff who deal with users in a concerned or considerate fashion	160	5	**6.03**	0.93
12	Having the users' best interests at heart	162	3	**6.02**	0.87
13	Willingness to help users	159	6	**6.02**	0.94
14	Performing services right the first time	157	8	**5.95**	0.95
15	Readiness to respond to user's questions	156	9	**5.94**	0.97
16	A comfortable and inviting location	161	4	**5.94**	0.81
17	Dependability in handling user's service problems	154	11	**5.90**	0.92
18	Modern equipment	158	7	**5.89**	0.93
19	Keeping users informed about when services will be performed	156	9	**5.88**	0.99
20	Providing services as promised	156	9	**5.88**	0.97
21	Library staff who are always courteous	160	5	**5.86**	0.92
22	Timely document delivery	150	15	**5.85**	0.95
23	Library staff who understand the needs of their users	156	9	**5.83**	1.00
24	Providing services at the promised time	152	13	**5.81**	0.93
25	Library staff who instill confidence in users	160	5	**5.79**	0.89
26	Access to digital collections from PC	152	13	**5.76**	1.08
27	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	160	5	**5.72**	1.00
28	Giving users individual attention	159	6	**5.65**	0.91
29	Instruction in use and/or training sessions, when needed	154	11	**5.56**	1.00

Table 4.10
Desired Service Expectation of Undergraduate Students (Order by Means)

Undergraduate students' desired expectation

Order	Statements	Frequency	Missing	Mean	SD
1	Space that enables quiet study	260	6	**6.38**	0.89
2	A place for reflection and creativity	257	9	**6.31**	0.84
3	Visually appealing facilities	262	4	**6.12**	0.99
4	Willingness to help users	259	7	**6.11**	0.99
5	Library staff who deal with users in a concerned or considerate fashion	259	7	**6.09**	1.01
6	A comfortable and inviting location	260	6	**6.08**	0.91
7	Assuring users of the accuracy and confidentiality of their personal information/data	262	4	**6.08**	1.07
8	Availability of required information	262	4	**6.07**	0.91
9	Expect to find information and new ideas	259	7	**6.07**	1.04
10	Library staff with the knowledge to answer user's questions	257	9	**6.06**	1.00
11	Prompt service to users	258	8	**6.04**	0.98
12	Performing services right the first time	253	13	**6.02**	1.03
13	Convenient access to library collections	258	8	**6.02**	0.97
14	Modern equipment	258	8	**6.02**	1.02
15	Convenient opening hours	261	5	**6.02**	0.91
16	Providing services as promised	260	6	**5.97**	1.03
17	Library staff who understand the needs of their users	260	6	**5.97**	1.04
18	Having the users' best interests at heart	259	7	**5.97**	1.01
19	Dependability in handling user's service problems	257	9	**5.96**	1.04
20	Readiness to respond to user's questions	254	12	**5.93**	1.05
21	Library staff who are always courteous	261	5	**5.93**	1.05
22	Providing services at the promised time	250	16	**5.86**	0.97
23	Library staff who instill confidence in users	256	10	**5.84**	0.97
24	Keeping users informed about when services will be performed	257	9	**5.82**	0.98
25	Access to digital collections from PC	255	11	**5.80**	1.11
26	Timely document delivery	251	15	**5.72**	1.05
27	Instruction in use and/or training sessions, when needed	256	10	**5.68**	1.13
28	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	261	5	**5.64**	1.14
29	Giving users individual attention	261	5	**5.55**	1.21

If all attributes are ranked respectively by means, the top ten of the desired service expectations of all user groups are as the following table :

Table 4.11
Service Expectations of all User Groups (Order by Means)

Overall Expectation

Order	Statements	Frequency	Missing	Mean	SD
1	Space that enables quiet study	636	25	6.32	0.86
2	A place for reflection and creativity	629	32	6.30	0.87
3	Expect to find information and new ideas	636	25	6.16	0.97
4	Library staff with the knowledge to answer user's questions	618	43	6.15	0.93
5	Assuring users of the accuracy and confidentiality of their personal information/data	625	36	6.14	0.96
6	Convenient access to library collections	636	25	6.13	0.89
7	Willingness to help users	634	27	6.10	0.95
8	Visually appealing facilities	640	21	6.09	0.96
9	Library staff who deal with users in a concerned or considerate fashion	635	26	6.09	0.95
10	Availability of required information	641	20	6.08	0.88
11	Convenient opening hours	636	25	6.04	0.90
12	Prompt service to users	635	26	6.03	0.96
13	A comfortable and inviting location	641	20	6.02	0.90
14	Having the users' best interests at heart	642	19	6.02	0.97
15	Modern equipment	631	30	6.00	0.97
16	Performing services right the first time	610	51	5.99	0.99
17	Library staff who are always courteous	638	23	5.97	0.96
18	Providing services as promised	615	46	5.97	0.99
19	Readiness to respond to user's questions	618	43	5.96	1.00
20	Dependability in handling user's service problems	620	41	5.95	0.96
21	Library staff who understand the needs of their users	627	34	5.95	1.00
22	Keeping users informed about when services will be performed	623	38	5.91	0.98
23	Providing services at the promised time	597	64	5.90	0.95
24	Access to digital collections from PC	610	51	5.89	1.06
25	Timely document delivery	596	65	5.84	0.98
26	Library staff who instill confidence in users	629	32	5.84	0.95
27	Visually appealing materials (such as pamphlets, statements or signs) associated with the service	632	29	5.76	1.06
28	Instruction in use and/or training sessions, when needed	615	46	5.71	1.07
29	Giving users individual attention	632	29	5.65	1.06

If we consider the top ten attributes that were commonly or partially expected by all respondent groups, the result are as follows:

Table 4.12
Top Ten Attributes of Desired Service Expectation of all User Groups

Dimensions	Attributes	Fac./Res.	Grad.	Under grad.
1. Library as Place	Space that enables quiet study	√	√	√
2. Library as Place	A place for reflection and creativity	√	√	√
3. Collection & Access	Expect to find information and new ideas	√	√	√
4. Assurance	Library staff with the knowledge to answer user's questions	√	√	√
5. Assurance	Assuring users of the accuracy and confidentiality of their personal information/data	√	√	√
6. Collection &Access	Convenient access to library collections	√	√	
7. Responsiveness	Willingness to help users	√		√
8. Tangibles	Visually appealing facilities		√	√
9. Empathy	Library staff who deal with users in a concerned or considerate fashion	√		√
10.Collection & Access	Availability of required information		√	√

The desired service expectations shown in Table 4.12 reflect that the users required information that match their needs with convenient accessibility. They can find material easily and library can provide a place for quiet study, appealing facilities and modern equipment. Whenever they encounter the service problem, the staff with knowledge are willing to help them and they want the accuracy and confidentiality of their personal information and data.

* **Note** : From Table 4.1 to Table 4.12 , the dimensions of original SERVQUAL will be used for simple interpretation

What are the underlying dimensions of service quality of TU Library System from user perspectives?

The factor analysis method is applied to investigate the dimensionalities of service quality from user perspectives. Table 4.13 represents the result of the exploratory factor analysis after excluding non-users from the data collected at TU Library System. The values of desired expectations were set as the variables, and the principal factor method with direct-oblimin rotation (oblique rotation) was used. After considering the result from the scree plot, The following 3 factors are the most appropriate.

1.Affect of Service – Organizational The first factor is about the service content which planned or offered by the library as an organization .Some items that strong response to this factor are related to the service which provide by the library

such as ; "Visually appealing materials (such as pamphlets, statements or signs) associated with the service" "Instruction in use and/or training sessions, when needed" "Access to digital collections from PC" and "Providing services as promised" . The items related to service mind such as "Library staff who understand the needs of their users" "Library staff who are always courteous " and "Willingness to help users" are also included in this factor. It seems that the users want to access library service via staff approach.

2. Collection and Access This factor is about complete collection which is conveniently accessible via modern equipment , library location which is convenient for access and appropriate service time. The items which show strong response on this factor are " A comfortable and inviting location" Convenient access to library collections "Availability of required information" and "Convenient opening hours"

3. Affect of service – Personal The third factor is associated to staff knowledge and ability to perform good service. The items show high loading on this factor are "Dependability in handling user's service problems" "Readiness to respond to user's questions" "Performing services right the first time" and "Library staff with the knowledge to answer user's questions"

Although the items which associate to the place such as "Space that enables quiet study" "A comfortable and inviting location " and "A place for reflection and creativity" can't form a new factor, they show strong response on entire factors. It means that libraries as places for study, rendezvous are still important from user perspectives.

Table 4.13
Factor analysis of Desired Service Perceptions

Pattern Matrix   **Factor**

	1	**2**	**3**
Visually appealing materials (such as pamphlets, statements or signs) associated with the service	**0.82**	0.02	0.00
Library staff who understand the needs of their users	**0.80**	-0.06	0.11
Providing services as promised	**0.80**	-0.09	0.11
Assuring users of the accuracy and confidentiality of their personal information/data	**0.77**	-0.02	0.09
Library staff who are always courteous	**0.76**	0.27	-0.15
Instruction in use and/or training sessions, when needed	**0.75**	-0.12	0.16
Keeping users informed about when services will be performed	**0.74**	0.07	-0.01
Modern equipment	**0.73**	0.15	-0.08
Willingness to help users	**0.72**	0.14	-0.03
Access to digital collections from PC	**0.72**	-0.08	0.05
Giving users individual attention	**0.70**	0.14	-0.02
Space that enables quiet study	**0.67**	0.23	-0.08
Timely document delivery	**0.59**	-0.16	0.26
A comfortable and inviting location	0.05	**0.79**	0.00
Convenient access to library collections	0.01	**0.77**	0.11
Having the users' best interests at heart	0.14	**0.74**	0.05
Availability of required information	-0.03	**0.71**	0.18
Visually appealing facilities	0.17	**0.64**	0.05
Convenient opening hours	0.09	**0.63**	0.08
Prompt service to users	0.11	**0.62**	0.17
Dependability in handling user's service problems	-0.01	0.03	**0.86**
Readiness to respond to user's questions	0.07	0.01	**0.81**
Performing services right the first time	0.03	-0.01	**0.78**
Library staff who deal with users in a concerned or considerate fashion	0.01	0.16	**0.77**
Providing services at the promised time	0.13	-0.15	**0.76**
Library staff with the knowledge to answer user's questions	0.03	0.06	**0.76**
A place for reflection and creativity	-0.01	0.18	**0.69**
Library staff who instill confidence in users	0.11	0.10	**0.69**
Expect to find information and new ideas	-0.03	0.28	**0.64**

Extraction Method: Principal Axis Factoring.
 Rotation Method: Oblimin with Kaiser Normalization.

Eigen values	15.14	1.96	1.63
Contribution (%)	52.20	6.76	5.62
Cumulative contribution (%)	52.20	58.96	64.58

Factor correlation matrix

Factor	1	2	3
1	1	0.59	0.69
2	0.59	1	0.48
3	0.69	0.48	1

By individual user group, what attributes are inside and outside the range of   the " Zone of Tolerance " ?

To investigate the " Zone of Tolerance " among 3 user groups, the means of 3 levels of services : desired service expectations, perception of actual services, and minimum service expectations are compared and shown in graphs (see Graph 4.1-4.3).

For faculty/researcher group, there are 4 attributes that are not in the range of the "Zone of Tolerance" : " Access to digital collection from PC " " Space that enables quiet study " " A place for reflection and creativity ", and "Expect to find information and new idea " (see Graph 4.1)

For graduate student group, 2   attributes are not in the range of the " Zone of Tolerance " : " Access to digital collections from PC ", " Instruction in use and/or training when needed " (see Graph 4.2)

For undergraduate student group, there are 4 attributes which are not in the range of the " Zone of Tolerance " and both are related to staff attributes : " Willingness to help users" " Library staff who deal with users in a concerned or considerate fashion ", " Library staff who understand the needs of their users ", and " Giving user individual attention" (see Graph 4.3) It seems that undergraduate students encountered problem related to library staff when involved in library service but for the faculty/researcher and graduate students the attributes related to the dimensions " Collection&Access " and the place are not so problematic.

Graph 4.1Faculty/researcher perception and Zone of Tolerance

Faculty/Researcher Perceptions & Zone of Tolerance

Graph 4.2 Graduate student perception and the Zone of Tolerance

TU Graduate Students - Perception & Zone of Tolerance

Legend:
- Minimum service
- Desired service
- Perceptions of actual service

Axis labels (clockwise):
Visually appealing facilities
Modern equipment
Visually appealing materials (such as pamphlets, statements or signs) associated with the service
Performing services right the first time
Providing services as promised
Providing services at the promised time
Dependability in handling user's service problems
Prompt service to users
Keeping users informed about when services will be performed
Willingness to help users
Readiness to respond to user's questions
Library staff who instill confidence in users
Library staff who are always courteous
Library staff with the knowledge to answer user's questions
Assuring users of the accuracy and confidentiality of their personal information/data
Convenient opening hours
Library staff who understand the needs of their users
Library staff who deal with users in a concerned or considerate fashion
Giving users individual attention
Having the users' best interests at heart
A place for reflection and creativity
A comfortable and inviting location
Space that enables quiet study
Availability of required information
Timely document delivery
Convenient access to library collections
Access to digital collections from PC
Instruction in use and/or training sessions, when needed
Expect to find information and new ideas

Graph 4.3
Undergraduate student perception and Zone of Tolerance

TU Undergraduate Student
& Perceptions & Zone of Tolerance

Legend:
- Minimum service
- Desired service
- Perceptions of actual service

Axis labels:
- Visually appealing facilities
- Modern equipment
- Visually appealing materials (such as pamphlets, statements or signs) associated with the service
- Performing services right the first time
- Providing services as promised
- Providing services at the promised time
- Dependability in handling user's service problems
- Prompt service to users
- Keeping users informed about when services will be performed
- Willingness to help users
- Readiness to respond to user's questions
- Library staff who instill confidence in users
- Library staff who are always courteous
- Library staff with the knowledge to answer user's questions
- Assuring users of the accuracy and confidentiality of their personal information/data
- Convenient opening hours
- Library staff who understand the needs of their users
- Library staff who deal with users in a concerned or considerate fashion
- Giving users individual attention
- Having the users' best interests at heart
- A place for reflection and creativity
- A comfortable and inviting location
- Space that enables quiet study
- Availability of required information
- Timely document delivery
- Convenient access to library collections
- Access to digital collections from PC
- Instruction in use and/or training sessions, when needed
- Expect to find information and new ideas

Scale values: 3.00, 4.00, 5.00, 6.00, 7.00

<u>What are the problems users encountered when involved in library services?</u>

        To investigate the problems users encountered when involved in library services, the user comments are classified by categories and counted.(Table 4.14) The most problems users encountered are library material inadequacy and outdated resources (books, journal, newspaper, computer terminals) The reshelving problem is also another problem as the users cannot find the books on shelves, though they found in OPAC. It seems that most problems are related to library resources, place for study, and modern equipment. The library staff attributes cannot satisfy the users because the users still comment about service mind, impoliteness and courtesy. The users also comment about the locker service as they don't understand why they have to leave their baggage in the lockers while the library has censor machine at the entrance gate that can examine the non-circulated material. Though the library installed barcode on all material and the circulation process is computerized, the users still wait too long in line when they access circulation process.

Table 4. 14
Problems that users encountered when involved in library services

Categories	No. of comment
Books are not sufficient	51
Reshelving problem	41
Books are not update	23
Wait too long in line	15
Computer are not sufficient	15
Space are not sufficient for study	14
Some staff are impolite	13
Staff should have service mind	10
Service hours are not convenient	10
Libraries are too noisy	10
OPAC problem (interface, complicate, slow retrieval)	10
Locker service is not convenient	10
Problem when use remote access (slow, cannot access)	7
ILL is not convenient	7
Circulation service is not flexible	7
Want more remote service	6
Want more internet service	6
Circulation information is not reliable	5
Journal are not enough and update	5
Temperature in library (too cold, too hot etc.)	4
Want more facilities (toilet, drinking water, snack corner)	3
More directional signs	3
Access card system has problem	3
Staff are not sufficient	3
Library should inform about services	3
Want more online journal	3
Librarians should have knowledge	2
Material is out of order, damaged (books, computers)	2
Photocopy service is not convenient	2
Want more index&abstract service	2
Library server often has problem	2
I don't feel safe in library	1
Improve subject heading specification	1
Want more newspaper	1
Want comfortable seats	1
Instruction and/or training via video	1
Computer work very slow	1
TOTAL	**303**

<u>Summary of Findings</u>

The research findings can answer the research questions and can be summarized as the followings :

<u>Research question 1 : In what ways do TU Library System provide service to its users ?</u>

The results from calculation of gap differences between desired expectations and perceptions of actual service of all user groups were ranked respectively in order to investigate what attributes of service quality meet, exceed, or fall shot from the user perspectives.(see Table 4.1) The results revealed that all attributes of service quality don't meet the users' expectations. The reason is that it is natural tendency of people to wish for more than they have. From user perspectives, the dimensions "Collection & Access" and the place are most problematic as the gap differences are larger. The result is relevant to user comments that the books are not sufficient and update, there is problem about reshelving, and library space is not sufficient for study, besides the libraries are too noisy. The largest gap among all attributes is " Access to digital collection from PC ". Though only a half of respondents use remote access(Table 3.12), the gap is the largest. It seems that users want to use remote service but the libraries cannot provide sufficiently. Though the gaps related to staff attributes are not too large, it cannot be concluded that the users are satisfied. The missing values of the attributes related to staff are high when users rated for actual service perceptions (see Table 3.20) It is possible that users seldom contact librarians because they cannot decided whether library staff can provided services at the promised time, provided instruction in use, performed service right the first time, etc. or not.

To summarize the result, all attributes of service quality that TU Library System provide to its users don't meet the user expectations and the attributes related to dimensions " Collection & Access " and the place are most problematic as the gap differences are larger that the others. It is possible that library users seldom contact library staff when they involved in library services so the attributes that occupied the larger gaps are about service mind not about ability of staff.

<u>Research question 2 : By individual group of users, in what ways do TU Library System provide service to its users?</u>

The t-test and the gap difference ranking of individual user group are calculated to investigate what attributes of service quality meet, exceed, or fall shot from the user perspectives (see Table 4.2- 4.7)

The results revealed that by individual group of user, all desired service expectations are lagged behind the actual service perceptions and there are different perspectives among 3 user groups.

For faculty/researcher group and graduate student group, the larger gaps are fell into dimensions " Collection & Access " and related to library place and the gap of the attribute " Access to digital collection from PC " is the largest.

For undergraduate group, the staff attributes are occupied the larger gaps and followed by those of dimensions " Collection & Access " and the library place.

It seems that library may treat faculty/researcher different from students.

<u>Research question 3 : By individual group of users, which attributes of service quality meet, exceed or fall short user perceptions ?</u>

For the 3rd research questions, the gap differences between desired service level and actual service perception as well as a paired sample t-test will be calculated. (Table 4.2-4.7) . It can be summarize that from the perspectives of individual user group, all service quality attributes don't meet their desired expectations and the reason was aforementioned. For faculty/researcher group and graduate group, most attributes which don't meet user expectations are related to Collection & Access and Library as Place. For undergraduate group, most attributes related to staff attributes don't meet user expectations.

Research question 4 : By individual group of users, in what way do the users expect for excellent service quality from TU Library system ?
The means of desired service expectations of each user group and all user groups were ranked and compared .(Table 4.8 – Table 4.12) to elicit the answer of this research question. The result reveals that among 3 groups of users, the expectations are very similar. The top five expectations of all user groups are the same attributes. (Table 4.12) (though the orders are a little different) The users expect to find information that match their needs with convenient accessibility via modern equipment as well as expect to find the quiet place for study. They expect library staff with service mind and knowledge to help them when they encounter service problems . The users expect to find information by their own as the attribute
" Instruction in user and/or training sessions when needed" is ranked very low in all user groups. Anyway, some users don't know their real expectations as they don't realize some service such as Document delivery of Remote access service.

Research question 5 : What are the dimensions that determine the customers' evaluation of service quality of TU Library System?
Factor analysis method will be applied to investigate the underlying dimensions of service quality. The results can be supported information for the library managers to convert the theory into practical resources allocation decisions (Philip J. Calvert, 2001).
The result from factor analysis method shows the dimensions that determine the customers' evaluation of service quality are ; Affect of service – organizational , Collection and Access , and Affect of service – personal. This finding reveals which are the important items in each factors.
On entire factors, the items related to service mind show high loading. It implies that users still want the library staff to help them to accomplish their objectives of library usage. Although the attributes related to library place cannot be formed a new factor, high loading on each factor also implies its importance.

Research question 6 : What are the most essential attributes that library managers should allocated the resources to support for improving excellent service quality?

The " Zone of Tolerance " which is the range between desired service expectation and minimum service expectation will be calculated to find such attributes. A performance below the tolerance zone will engender customer frustration and decrease customer loyalty. Among 3 user groups, some attributes are below the zone of tolerance and TU Library System should allocate the resources to support for improving excellent service quality. The attributes are as the followings :

For faculty/researcher group, the attributes belong to dimensions " Collection & Access " and library place are below the zone of tolerance. The attributes which library should concern are " Access to digital collection from PC " " Space that enables quiet study " " A place for reflection and creativity ", and " Expect to find information and new idea " (See Table 4.1)

For graduate student group, the attributes belong to dimension " Collection & Access " are below the zone of tolerance. The attributes are " Access to digital collection from PC " and " Instruction in user and/or training session when needed "

For undergraduate group, the attributes belong to staff attributes are below the zone of tolerance. Those attributes are " Willingness to help users" and " Library staff who understand the needs of their users " " Library staff who deal with users in a concern or considerate fashion " and " Giving users individual attention "

The library managers should provide collection that match user need with convenient accessibility via modern equipment as well as comfortable and quiet place for study. In addition to library staff should be helpful when the users encounter service problems.

The result also confirms the finding in research question 2 that library staff may treat faculty different from students.

Summary of the attributes below the Zone of Tolerance

Groups	The attributes
Faculty/researcher	• Access to digital collection from PC • Space that enables quiet study • A place for reflection and creativity • Expect to find information and new idea
Graduate Students	• Access to digital collection from PC • Instruction in user and/or training session when needed
Undergraduate Students	• Willingness to help users • Library staff who understand the needs of their users • Library staff who deal with users in a concern or considerate fashion • Giving users individual attention

<u>Research question 7 : What problems did the users encountered when involved in library service?</u>

        To answer this question, user comments are counted and classified by categories. (Table 4.14) The results reveal that most problems users encountered are related to library material inadequacy, outdate resources, inconvenient accessibility as well as lacking quiet place for study. Another problem is related to staff attributes as the users commented about service mind and courtesy. In addition, the users want more effective remote service access.

Chapter 5

Summary, Discussion and Recommendations

Overview of the Study

This chapter presents a summary, discussion of the research findings and examines implications.

Statement of the Problem

The problem of this study was to assess the service quality of TU Library System by investigating the 3 levels of service quality from the user perspectives: (minimum service adequacy, desired expectations, and actual service perceptions) The result gained can identify what are user desired expectations and whether those expectations have been met or not.

Surveys of faculty members, researchers, graduate and undergraduate students were used to identify each level of services. The results gained from the calculation of the Zone of Tolerance and dimensionalities of service quality can help the library managers to identify action and allocate resource that can be taken to improve library services.

Subjects

The subjects of this study consisted of 216 faculty members, 11 researchers, 165 graduate students, and 266 undergraduate students (3 unknown users) of Thammasat University.

Instrumentation

For pretest, the Thai version of the instrumentation was administered to 4 faculty members, 1 researcher, 3 students of Thammasat University. The validation of the translation was checked and edited after the pretest. Some questions were expanded and the samples about library services were raised to clarify the meaning.

Data Collection

The Thai translation of the modification of SERVQUAL questionnaire was administered to 4 groups of users : faculty members, researchers, graduate and undergraduate students of Thammasat University. The response was constituted 17.79 % of total population of faculty members, 45.83% of total population of researchers, 2.58% of total population of graduate students, and 1.36 % of total population of undergraduate students.

Statistical Analysis

After gathering the questionnaires, the survey data was keyed in Excel file. Before transferring to SPSS version 11.0, the procedures of data treatment were set to validate the data for further analysis. After data treatment, the data was transferred to SPSS Version 11.0 and do statistical analysis in order to accomplish the purposes of the study. The descriptive research approach was used in addition to means, standard deviation, percent, and a t-test for dependent samples. To investigate the underlying dimensions of service quality, the multivariate statistical method like factor analysis was used.

Open-ended responses were read by the researcher, counted and categorized into free categories.

Discussion

The study examined the 3 levels of user perspectives: (minimum service adequacy, desired expectations, and actual service perceptions). The results gained can identify the gap differences between desired expectations and actual service perceptions of TU Library System and the way that library has provided service to its users. The information can also reveal the way users expect for excellent service quality from TU Library System.

There are several insights gained from the unmet expectations, the way of user expectations, and the problem user encountered. At the same time, the Zone of Tolerance and dimensionalities are investigated. The results can be used for future study related to library service quality at TU Library System.

The Gaps Between User Desired Expectations and Actual Service Perceptions

The study results reveal that all service quality attributes of desired expectations are not met. The reason maybe like Surithong Srisa-ard mentioned in her doctoral dissertations that it is so common for people to expect more than they have in their day-to-day life. The larger gaps are related to the dimensions " Collection & Access " and library place .This finding is relevant to user comments in open-ended responses (Table 4.13) . The largest gap of all is " Access to digital collection from PC ". It is interesting that about a half of the respondents don't access library remote service (Table 3.12) but the gap is still the largest one. It seems that users want to access this service but don't have enough facilities or computer literacy for using this service. It is possible that they don't know this service is available. The gap differences related to staff attributes also have large sizes and it is about service mind. The gap sizes relate to staff attributes (Reliability) are not too large as it seems that the users seldom contact the staff personally so they cannot rate those attributes. (Table 3.20) When looking at the age of most respondents, it seems that most to them are young generation so it is possible they want to access library service by their own without intermediation. (Table 3.8). The gap sizes relate to the place for quiet study and rendezvous are also large and this is relevant to the frequencies of library use and remote use. (Table 3.1 – Table 3.12). Anyway, for the attribute " A comfortable and inviting location ", the gap size is the smallest one. It is possible that the libraries are comfortable and have inviting locations but don't have quiet space for study. A half of users never access remote access so it seems that they access library buildings directly so the sufficient space is still required.

There are the differences of gap sizes among 3 user groups in terms of orders. (Table 4.2-Table 4.6). While the higher order gaps of faculty/researcher group relate to dimensions " Collection & Access " and library place , the gap sizes of the attributes relate to library staff are at the top five in the perspectives of undergraduate students. For graduate students, these attributes are ranked behind the physical attributes so the result is relevant to that of Surithong Srisa-ard's. The library staff may treat faculty/researcher group different from student groups. Anyway, the collection inadequacy and lack of place for study are still problems of all groups. When looking at the dimensions " Collection & Access " , the faculty/researcher group and graduate student group seems to have more problem about the insufficient resource than that of undergraduate student group because the gap of an attribute "

Expect to find information and new ideas " are at top five ranking. On the contrary, this gap size of undergraduate student group is quite low (rank 15). It is possible that about a half of the undergraduate student respondents are freshmen and sophomores (Table 3.6). The freshmen are still studying prerequisite courses and if compare with faculty/researcher group and undergraduate student group , they are not heavy users so information and new idea are not needed at this time.

The User Desired Service Expectations

The top five of desired service expectations that commonly expected by all user groups relate to library place, knowledge of librarians, accuracy of their service record, and convenient access to complete collection (Table 4.12).It seems that in addition to rich collection, convenient accessibility and place for study, the users still want the librarians to have knowledge to answer their questions and library can assure the accuracy and confidentiality for their personal information/data.

Although the users want to access library collection conveniently, the attribute " Access to digital collections from PC " is not ranked at the higher order. It is possible that the users don't have much experience in using remote access service and digital collection so they cannot clarify their real expectations. The attribute " Availability of required information " was not ranked in higher order either, especially in the perspectives of faculty/researcher group, though it is belong to the dimension " Collection & Access ". It is possible that some users used their own collections or department collections. The data reveals that about 35.2% of users use faculty libraries which include department collections (in the sense of the respondents).(Table 3.10) The attribute "Instruction in use and/or training sessions, when needed " was ranked very low by all user groups. It seems that the users want to use library by their own without intermediation. This finding is very similar to that of Philip J. Calvert's. In addition, the staff attributes (Reliability) are not ranked in higher orders. It is possible that most users seldom contact librarians when access library services so they cannot clarify their real expectations. The data from desired service expectations suggested that the users need required information that matches their needs with conveniently accessibility by their own. They can find material easily and library can provide a place for quiet study, appealing facilities and modern equipment. Whenever they encounter service problem, they library staff with knowledge are willing to help them and they want the accuracy and confidentiality of their personal information and data. This finding implies that " *academic users users have very similar expectations of services.* The national culture does not seem to be a major precursor of attitudes to service quality.

The Dimensions of User Desired Expectations

The dimensions of service quality were analyzed by factor analysis method. Factor loadings on each dimension suggests that 3 dimensions are appropriate to explain service quality from user expectations. Those dimensions are Affect of service –organizational, Collection&Access, and Affect of service – personal. This finding is similar to those of Nitecki's and Calvert's. It seem that users concern staff attitude, complete collection, and the ability of organization to perform good service. The result from factor analysis reveal that staff attributes play major role on service quality because of high loading on entire factors. The attributes related to library place also have high loading on entired factors which is relevant to

the result of the Zone of Tolerance. It seems that the library place is still needed by users. The space doesn't seem problematic but the quietness, creativity are needed.

The Zone of Tolerance

There are some service quality attributes below the Zone of Tolerance. For faculty/researcher group and graduate student group, the attributes belong to library place and "Collection & Access" are below the Zone of Tolerance. On the contrary, from the perspectives of undergraduate students, the staff attributes belong to dimensions are below the Zone. The library staff may treat faculties/researchers different from students. The data from open-ended responses also confirms this finding. From the perspectives of faculty/researcher group and graduate student group, the attribute that is commonly below the Zone of Tolerance are " Access to digital collection from PC ". It implies that the library has to provide more service through networked environment. In addition, the library should provide sufficient facilities too. Although the collection size belong to TU Library System is higher than that of the standard of academic library 2001 (TU Library System, 2002), the attribute " Expect to find information and new idea " is still below the Zone. Actually, it is so common that no library can own complete collection that match user needs. The concept of resource sharing may alleviate this problem but it seems that users don't realize some useful service such as document delivery service and only a few access digital collection. The missing values of these 2 attributes confirms this surmise.(Table 3.21). When looking at the missing values of the attributes related to reliability , it implies that users seldom contact library staff when access library service so they have a little chance to receive appropriate instruction. For graduate student group, the attribute " Instruction in use and / or instruction sessions , when need " is below the Zone. It implies that they still want to learn to use library effectively but the data from desired expectation reveals that the users don't expect this service so much. The library should find an alternative way to provide the instruction. For undergraduate student group, the staff attributes that related to service mind are below the Zone. Thammasat University don't provide the prerequisite course about library using for undergraduate students so they may have problems when access library services and want to personally contact library staff. Thai students don't have much background in using library from school education system so they need willingness, courtesy, and empathy when they encounter service problems.

The Problems Users Encountered When Involved in Library Services

All user comments were classified into categories and counted manually. The data suggested that most problems users encountered are library collection, accessibility, insufficient space, and service mind. The most problems are about the insufficient and outdate collection. Another underlying problems is about inaccurate accessibility. The reshelving problem is also most problematic. The users cannot find the books on shelves, though they found information via OPAC. The service mind is another problem too. When looking at the missing value related to library staff attributes (most related to Reliability) , it seems that users don't have problem with professional staff but they have problems with other staff. The comments are like " Some staff are impolite ", " Some staff don't have service mind " or " Some staff are not courteous" and there are only 2 comments related to knowledge of staff. It maybe because the users seldom contact the librarians so they didn't complain.

Recommendations

After reviewing the result, the recommendations will be presented for improvement of good service quality.

1. **The service attributes that library should allocate resources to improve for good service quality** The service quality attributes which don't meet user desired expectations from the calculation of the Zone of Tolerance and Factor analysis shown that most problems are related to insufficient library collection, quiet place for study, and service mind. Though the library budget is not sufficient, library should consider how to minimize the gap between user desired expectations and actual service perceptions appropriately. The attribute " Access to digital collection from PC" is below the Zone of Tolerance from the perspectives of both faculty/researcher and graduate student groups so the libraries should facilitate urgently. More computer terminals, internet access points must be provided. For undergraduate student group, they comment about staff service mind because they are not keen in library using so the staff should more concern.

2. **Library instruction or training session** Though the data reveals that the attribute " Instruction in use and/or training sessions, when needed " is ranked very low from user desired expectations, the result of the zone of tolerance reveals that graduate student group still need instruction/or training. The researcher believe that they don't want formal training course so the libraries should seek alternative way of training. The missing value also reveals that the users seldom contact librarians when involve in library service and it seems that users want to use library by their own. The library should consider how to provide library effective guide both printed and electronic version associate with the services. For the researcher's opinion, the librarians should cooperate with the lecturers to recommend library resources, service etc. on the beginning of the class.

3. **Remote access service** Though only a half of respondents access remote service, the data from desired expectations reveals that users want to access digital collection. The library should provide more facilities such as computer terminal, internet service, etc. to enhance remote access service.

4. **Material associated with the service** The data reveals that about a half of users don't access remote access. It seems that users don't know how to access those services. Actually, the library provide such document in library building but the

5. **Staff** The data calculated from the Zone of Tolerance implies that library staff may treat each user group differently so the library staff should consider this finding. High missing value related to staff knowledge implies that users seldom contact professional staff so reference service should be more proactive, besides reference desk should be easy to observe.

6. **Public relations about the services** The libraries should announce services and resources via library homepage. The library homepage need urgently improved. It must be more informative and well organized. The structure of the homepage should be clear and easy to use. Remote access will be more and more increased as most users are young generation. They get use to using library services via internet.

7. **Interlibrary loan service** User comment about insufficient and out date library collection is at the highest rank. Though it is so common that no library has complete collection, effective interlibrary loan service must be enhanced to

alleviate this problem. The ILL regulations must be officially set. Now TU Libraries located at too many locations so effective ILL is needed.

      8. **Reshelving problems** The data from user comments reveals that this problem is at the higher rank. The library should seek the better way for improving reshelving speed. The missing books is also another problem.It maybe because the books are missing.

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APPENDIX

The modification of SERVQUAL questionnaire

แบบสอบถามความพึงพอใจของผู้รับบริการระบบการให้บริการยืมสำนักหอสมุด มหาวิทยาลัยธรรมศาสตร์

โปรดแสดงความคิดเห็นเกี่ยวกับความพึงพอใจของท่านต่อการให้บริการของสำนักหอสมุด มหาวิทยาลัยธรรมศาสตร์ เมื่อเรียบเทียบเกี่ยวกับความต่างของผู้รับบริการฯ

ระดับการให้บริการอย่างต่ำที่ท่านยอมรับได้ หมายถึง ระดับการให้บริการที่ให้บริการของสำนักหอสมุด มหาวิทยาลัยธรรมศาสตร์ ได้พัฒนาระดับที่เหมาะสมที่สุด โดยพิจารณาจากมาตรฐานบริการฯ / ต้องการมาตรฐานบริการฯ / พิมพ์โดยระบบน้อย
ระดับการให้บริการประสงค์จะได้รับ หมายถึง ระดับการให้บริการที่ท่านคาดหวังว่าจะได้รับจากหอสมุด และเมื่อได้รับการประเมินการให้บริการประสงค์จะได้รับ

********************* การตอบแบบสอบถาม ***********

(1) ระดับการให้บริการอย่างต่ำที่ท่านยอมรับได้ (กรุณาเลือกเพียง 1 ตัวเลข ในคอลัมน์ที่ 2) (2) ระดับการให้บริการที่ท่านประสงค์จะได้รับ (กรุณาเลือกเพียง 1 ตัวเลข ในคอลัมน์ที่ 3)

(3) ความเห็นเกี่ยวกับการให้บริการจริงที่ผู้รับจากสำนักหอสมุด มหาวิทยาลัยธรรมศาสตร์ กรุณาเลือกเพียง 1 ตัวเลข ในคอลัมน์ที่ 4 และถ้าท่าน " ไม่มีความเห็น" เกี่ยวกับการให้บริการจริงจากหอสมุด
กรุณาเลือก " N " ซึ่งอยู่ที่ขอบสุดท้าย และคอลัมน์สุดท้าย]

เมื่อท่านใช้บริการ ………	ระดับการให้บริการอย่างต่ำที่ยอมรับได้								ระดับการให้บริการที่ประสงค์จะได้รับ :								ระดับการให้บริการจริงที่ได้รับจากหอสมุด :							
	ต่ำ						สูง	N	ต่ำ						สูง	N	ต่ำ						สูง	N
1. ท่านได้รับหนังสือที่ต้องการจากหอสมุด	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
2. ความเหมาะสมของขอบเขตในการให้บริการ (เวลาเปิด-ปิด)	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
3. สถานที่ให้บริการสะดวกสบายและเหมาะสมเพียงพอให้ผู้รับบริการ	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
4. บุคลากรสนใจในการให้บริการผู้ใช้อย่างจริงใจ	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
5. มีความสะดวกในการรับบริการจากหอสมุด	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
6. บุคลากรให้บริการผู้ใช้อย่างรวดเร็วทันใจ	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N
7. สิ่งอำนวยความสะดวกภายใน คอมพิวเตอร์ อุปกรณ์โสตทัศน์ วัสดุฯ และ อุปกรณ์ต่างๆ	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N	1	2	3	4	5	6	7	N

มิติด้านการให้บริการ	ระดับการให้บริการอย่างที่ท่านยอมรับได้							ระดับบริการที่ประสงค์จะได้รับ							ระดับการให้บริการจริงที่ได้รับจากห้องสมุด :						
	น้อย						มาก	น้อย						มาก	น้อย						มาก
8. บุคลากรมีอัธยาศัยที่ดีเสมอ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
9. บุคลากรให้ความสนใจในการให้บริการแก่ผู้รับบริการรายบุคคล	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
10. สถานที่เรียบร้อยเหมาะสมดีในการศึกษาฯ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
11. มีวัสดุอุปกรณ์ในการให้บริการที่ทันสมัย	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
12. เปิดให้บริการตรงตามเวลาที่ผู้ใช้บริการมีความต้องการ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
13. เจ้าหน้าที่หาทรัพยากรเพิ่มเมื่อมีการเปลี่ยนแปลงและเงื่อนไขในการให้บริการ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
14. รับประกันความถูกต้องของข้อมูล/ข้อมูลส่วนบุคคลของผู้ใช้ เช่น ชื่อผู้ใช้งานและการยืมหนังสือของผู้ใช้และจะคงความเป็นส่วนตัว	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
15. ในผลิตการให้บริการบอกกล่าว หรือแนะนำทรัพยากรในการบริการ หรือ มีนโยบายและขั้นตอนการให้บริการต่างๆ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
16. สามารถเข้าถึงทรัพยากรในฐานข้อมูลออนไลน์ เช่น ฐานข้อมูลอิเล็กทรอนิกส์ (เช่น Ebsco Host, ABI/INFORM ฯลฯ) หรือ ฐานข้อมูลอื่นได้โดยยกเว้น/ใช้งานผ่านเครือข่ายอินเทอร์เน็ต	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
17. สามารถให้บริการได้ตรงตั้งความต้องการของผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
18. บุคลากรมีความเต็มใจพร้อมจะช่วยเหลือผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
19. มีการตอบสนองและจัดหาทรัพยากร/ข้อมูลและการมาให้บริการหรือปิดฉากๆ เป็นไปตามการรับมือที่ถูกต้อง	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
20. บุคลากรห้องสมุดสูงในความเชื่อมั่นต่อการตอบของผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7

เมื่อท่านใช้บริการ	ระดับการให้บริการอย่างต่ำที่ยอมรับได้							ระดับบริการจริงที่ได้รับ:							ระดับการให้บริการที่ได้รับจากที่ต้องการ:						
	น้อย						มาก	น้อย						มาก	น้อย						มาก
21. บุคลากรสามารถสร้างความมั่นใจให้กับผู้มาใช้บริการได้เมื่อใช้บริการ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
22. บุคลากรของหอสมุดมีพฤติกรรมบริการที่สุภาพและสามารถให้ผู้รับบริการเกิดความมั่นใจ	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
23. มีวัฒนธรรมที่ดีมีความสุภาพในการตอบคำถามของผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
24. บุคลากรของหอสมุดสามารถให้บริการได้อย่างถูกต้องเหมาะสม สมำ่ในการให้บริการพร้อมให้บริการเวลาเท่ากัน (ไม่ต้องมาก ในหรือต่ำกาย มูลเหตุเพิ่มเติมอีกเปิดเผยครั้งครั้งหรือจัดวาม)	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
25. บุคลากรสามารถจัดการกับปัญหาในการให้บริการอย่างชัดเจนได้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
26. ท่านไม่ค่อยมาถูกปฏิเสธจะมีเพราะขึ้นหลมและจะสะดวกให้เมื่อ จากการที่หอสมุด	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
27. มีวัฒนธรรมที่ดีมีวิธีพร้อมในการตอบคำถามเข้าถึงของผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
28. หอสมุดมีสถานที่สำหรับการศึกษาอย่างไม่สะดวกและเข้าทำให้ มีความผิดพลาดสร้างสรรค์	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
29. บุคลากรของหอสมุดให้ความสนใจในใจได้เมื่อติดต่อกับผู้ใช้	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7

**********ขอขอบพระคุณผู้ตอบแบบสอบถามที่ได้สละเวลาในการตอบแบบสอบถามฉบับนี้**********