

# **A study based on Kano model to improve satisfaction of students at university libraries in Sweden**

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**Abstract:** This paper designed the questionnaire for the case and combines the Kano Model with the LibQUAL+™ model to understand the students' perception and expectation of the library service quality in Sweden. Also, find a specific way to improve the satisfaction of the students.

**Key words:** Kano Model, LibQUAL+™, University libraries, satisfaction

## **I Introduction**

It is a common idea that a library is designed to meet the readers' need. And the university library as a place to access information and to learn, which plays an indispensable role in the life of students. At the same time, with the deepening of the degree of international education in Sweden, the needs and expectations of students become increasingly sophisticated as the growth number of international students reader exist.

Based on the Kano model, which could be able to better understand the different aspects of user evaluation services(Tang Hong, Research on Library Service Quality Based on Customer Satisfaction,p.19)

this paper designed the questionnaire for the case and combines with the LibQUAL+™ model to understand the students' perception and expectation of the library service quality in Sweden. Identify existing problems and areas where improvements are needed to help the library improve its readers' satisfaction.

## **II The introduction of Kano Model**

As we all know, good service leads to higher customer satisfaction, but the proportion of different services that brought consumer satisfaction is not the same, this is not a simple linear relationship.

Based on that and inspired by Hertzberg's two-factor incentive theory, Noriaki Kano, a

professor at the Tokyo Institute of Technology, presented the Kano Model in 1984[1], which divided customer's need into five levels in Figure 1(Hsin-Hung Wu,Yung-Tai Tang and Jyh-Wei Shyu,An integrated approach of Kano's model and Importance-Performance Analysis in identifying key success factors) respectively □A:attractive quality. When this kind of demand is met, even if the performance is not perfect could it also lead to the rapid increase in customer satisfaction. If such requirements are not met, it will not bring customer dissatisfaction. □O:one-dimensional quality. Customer satisfaction will increase significantly when such quality elements are met or performed well. But, when such needs are not met or performed well, customer dissatisfaction will increase significantly. □M:Must-be quality. Customer dissatisfaction will increase dramatically when such demand is not met or poor performance. And we could eliminate customer dissatisfaction when such quality elements are met, but does not lead to an increased customer satisfaction. □I:Indifference quality. Such elements, whether adequate or not, will not cause customer satisfaction or dissatisfaction. □ R: Reverse quality. This type of quality elements will cause dissatisfaction when sufficient, but satisfied when insufficient.(Huang Shang,Research on the Evaluation of University Library 's Service Quality Based on Kano Model and LibQUAL Model,p.49)

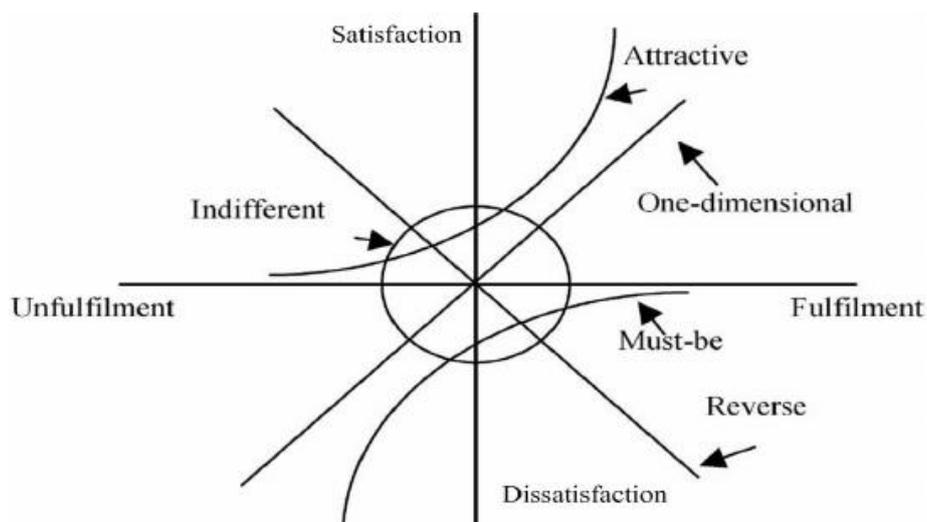


Figure 1: Kano Model

In order to identify the attribution of quality elements, Kano developed a structural questionnaire in Figure 2(Elmar Sauerwein, Franz Bailom, Kurt Matzler, Hans H. Hinterhuber \* Department of Management , University of Innsbruck,THE KANO MODEL: HOW TO DELIGHT YOUR CUSTOMERS) through the functional question and dysfunctional form of question from two angles, thereby reducing the ambiguity of the answer.

Functional form of the question	↓
If the edges of your skis grip well on hard snow, how do you feel?	<ol style="list-style-type: none"> <li>1. I like it that way</li> <li>2. It must be that way</li> <li>3. I am neutral</li> <li>4. I can live with it that way</li> <li>5. I dislike it that way</li> </ol>
If the edges of your skis do not grip well on hard snow, how do you feel?	<ol style="list-style-type: none"> <li>1. I like it that way</li> <li>2. It must be that way</li> <li>3. I am neutral</li> <li>4. I can live with it that way</li> <li>5. I dislike it that way</li> </ol>
Dysfunctional form of the question	↑

Figure 2: structural question

For the answer there are five ways: 1.I like it that way. 2.Take it for granted. 3.It does not matter 4.Can be tolerated. 5.Dislike.

According to the combination of the pair questions, we can identify the attribution of the quality elements in Figure 3, The evaluation results classification table of Kano Model. (The analysis of Kano Model,<http://wenku.baidu.com/link?url=v6QOB4VKu-ig4l6Cgj1XjPgmAOMy36jkhGYFFJFmn7z6bsEctEGLV8GZv8rabr04utY8J3EeH6mU1ZfzZmAs69rdfaYvo52xYhNYI3-zU4soxDRReSQx3y0YBja7i9KFc>)

<b>Dysfunctional question</b>						
	Index	I like it that way	Take it for granted	It does not matter	Can be tolerated	Dislike.
<b>Functional question</b>	I like it that way	Q	A	A	A	O
	Take it for granted	R	I	I	I	M
	It does not matter	R	I	I	I	M
	Can be tolerated	R	I	I	I	M
	Dislike.	R	R	R	R	Q

Figure 3: The evaluation results classification table of Kano Model

(A:attractive quality. O:one-dimensional quality M:Must-be quality I:Indifference quality R: Reverse quality)

To sum up, according to statistics Kano model, quality of service can be elusive specific and help companies to improve the satisfaction of customers by different measures. Based on the different quality characteristics of services, satisfaction of customers can be improved to in the order of priority(Shi Guohong,Zhao Qing,Mobile Library Service

### III Empirical research

#### 3.1 Kano model questionnaire design and survey data collection

##### 3.1.1 Questionnaire design

The core of the Kano model is to through the quality classification of user needs and to find help enterprises improve customer satisfaction entry point. (Tang Zhong jun, Long yuling, Research on Method of Acquiring Individual demand Based on Kano Model p.112) But how to know the specific needs of users? This is what the Kano model cannot offer. Accordingly, we hope that through the Kano Model and the existing mature LibQUAL+™ model combined to design an integrated questionnaire.

##### 3.1.1.1 The Introduction and development status of LibQUAL+™

LibQUAL+™ is a tool that libraries use to solicit, track, understand, and act upon users' opinions of service quality.

([https://www.libqual.org/about/about\\_lq/general\\_info](https://www.libqual.org/about/about_lq/general_info))

It is based on the development of SERVQUAL model. The SERVQUAL model is a service quality evaluation method applied to the service industry, which has been widely used in this area. (Wu Dongman, Research on Library Service Quality Evaluation Based on Library User 's Needs.p.31) Later, many libraries also began to draw on this model to measure the quality of the library's services. The practice found that the SERQUAL scale 22 indicators for the banking and retail industry has a very good effect, the library is not well targeted. Thus, in 2000, with the support of ARL (Association of Research Libraries), a program of quality of service research for libraries was initiated. (The analysis of Kano Model, <http://wenku.baidu.com/link?url=v6QOB4VKu-ig4l6Cgj1XjPgmAOMy36jkhGYFFJFmn7z6bsEctEGLV8GZv8rabr04utY8J3EeH6mU1ZfzzmAs69rdfaYvo52xYhNYI3-zU4soxDReSQx3y0YBja7i9KFc>)

They were able to fill and improve the SERQUAL scale by understanding their needs and expectations by in-depth interviews and surveys with users. And finally formed a 3 dimension 22 index of LibQUAL+™ (figure 4), proved to have a strong relevance to the library satisfaction survey. (Yang Zhigang, Identification and Externalization of Library 's Implicit Service Standard)

Level	Order	Index
	1	Librarians can enhance user confidence
	2	For each user to give personalized attention

Affect of Service	3	The librarian is polite and friendly
	4	The library is ready for feedback at any time when customer has the question
	5	The librarian has the knowledge to answer the user's question
	6	Librarians treat customers with concern
	7	Librarians can understand the needs of users
	8	The librarian is willing to help the user
	9	Librarians are trustworthy when dealing with user needs
Information control	10	Users can access electronic resources from home or office
	11	The library home page allows the user to retrieve the information by themselves
	12	Can provide users with the required printing resources
	13	Can provide users with the necessary electronic resources
	14	There are modern devices that allow users to easily find information
	15	There are easy-to-use tools to help users find the information they need
	16	Users can easily access information without help
	17	Can provide users with the required printing or electronic journals
Library environment	18	Can provide users with the required printing or electronic journals
	19	For each user to provide a quiet space to complete personal activities
	20	The overall environment is comfortable and attractive
	21	Is a good place to study and research
	22	There is room for the group to study and explore

Figure 4 LibQUAL+™: Index System

### 3.1.1.2 Combination of Kano model and LibQUAL+™ model and problem

design

Although we could get the specific needs of the readers based on the LibQUAL+™ index, the form of question is still different from the Kano model. In order to suit for the Kano Model's research, we modified the question content and form of the LibQUAL+™ index. Also, we asked Swedish students based on the open question of the interview, which added the question 10 and question 11 to the scale. All the things could see from the Figure 5.

Level	Order	Functional question	Dysfunctional form of question
<b>Affect of Service</b>	1	If the librarian is polite and friendly, how would you feel like?	If the librarian is not polite and friendly, how would you feel like?
	2	If the library is ready for feedback at any time when customer has the question, how would you feel like?	If the library is not ready for feedback at any time when customer has the question, how would you feel like?
<b>Information control</b>	3	If users can access electronic resources from home or office, how would you feel like?	If users cannot access electronic resources from home or office, how would you feel like?
	4	If the library can provide users with the required printing and electronic resources cheaply, how would you feel like?	If the library can provide users with the required printing and electronic resources expensively, how would you feel like?
	5	If there are English guidance to help you find the information that you need, how would you feel like?	If there do not have the English guidance to help users find the information they need, how would you feel like?
	6	If the library downloads digital resource data quickly, how would you feel like?	If the library downloads digital resource data slowly, how would you feel like?
<b>Library as Place</b>	7	If the library could provide a quiet space to complete personal activities for each users, how would you feel like?	If the library could not provide a quiet space to complete personal activities for each users, how would you feel like?
	8	If the overall environment is comfortable and attractive, how would you	If the overall environment is not comfortable and attractive, how would you feel like?

		feel like?	
	9	If there is enough place for students to study, how would you feel like?	If there is not enough place for students to study, how would you feel like?
	10	If there is “Fika” place to have some drink or snack, how would you feel like?	If there is not “Fika” place to have some drink or snack, how would you feel like?
	11	If there is some plant to relax, how would you feel like?	If there is not some plant to relax, how would you feel like?

Figure 5:Combination of Kano model and LibQUAL+™ model

### 3.1.2 Questionnaire data collection

There were several options how to collect the data from the questionnaire. The program used for this is called Thesistools.com and is a Dutch program. At this program the survey can be filled in and it is possible to directly see the results. The use of this program was because it is easy to combine with SPSS. Statistical Package of the social science (SPSS) is a statistical analysis program that helps analyze the collected data from the survey.

### 3.2 the survey results analysis

#### 3.2.1 Basic analysis of the questionnaire

At this part we describe a basic analysis of the data we got from the survey about the satisfaction of the library.

Count

		If the librarian is not polite and friendly how would you feel				Total
		Take it for granted	It does not matter	Can be tolerated	Dislike	
If the librarian is polite and friendly how would you feel like	I like very much	1	4	15	19	39
	Take it for granted	1	0	4	2	7
	It does not matter	0	1	0	1	2
	Dislike	0	0	0	1	1
Total		2	5	19	23	49

1. As you see in the figure above there are a lot of people (80%) how like it very much when the librarian is polite and friendly. On the other side, the dislike for an impolite and unfriendly librarian is just 47%. And 38% of the people can tolerate an unfriendly and impolite librarian but that means that they don't be happy with it. So people like a friendly and polite librarian and they care if there is not.

Count

		If the library is not ready for feedback at any time when customer					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If the library is ready for feedback at any time when customer	I like very much	1	1	10	16	10	38
	Take it for granted	0	1	0	2	2	5
	It does not matter	0	0	3	1	1	5
	Can be tolerated	0	0	0	0	1	1
Total		1	2	13	19	14	49

2. 77% of the students like it when the librarian is always ready for feedback. But it is not very important if the students cannot give any feedback at any time because the dislike is just 28%.

Count		If users cannot access electronic resources from home or office				Total
		Take it for granted	It does not matter	Can be tolerated	Dislike	
If users can access electronic resources from home or office	I like very much	3	9	12	18	42
	Take it for granted	0	1	2	1	4
	Can be tolerated	0	1	1	0	2
	Dislike	0	0	1	0	1
Total		3	11	16	19	49

3. Usage of electronic resources at home or office is very liked by the students because 85% of them likes it. If students are not able to use those resources it is not a big problem, 61% of the students find it okay.

Count		If the library cannot provide users with the required printing and_A					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If the library can provide users with the required printing and	I like very much	1	2	7	11	19	40
	Take it for granted	0	0	0	2	1	3
	It does not matter	0	1	2	0	0	3
	Can be tolerated	0	0	0	2	0	2
	Dislike	0	0	0	0	1	1
Total		1	3	9	15	21	49

4. Students (82%) like it when the library provide them with the required printing and electronic equipment cheaply. On the other side, almost half of the students (43%) dislike it when it is expensive, the other half of them are not bothered about it.

Count		If there do not have the English guidance to help users find the					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If there are English guidance to help you find the information	I like very much	2	3	9	8	18	40
	Take it for granted	0	0	0	2	1	3
	It does not matter	0	0	3	1	1	5
	Can be tolerated	0	0	0	0	1	1
Total		2	3	12	11	21	49

5. Most of the students (80%) found it important when there is an English guidance available at the library. And 43% of the people dislike it when there is no English guidance.

Count		If the library download digital resource data slowly how would					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If the library download digital resource data quickly how would	I like very much	1	1	1	19	16	38
	Take it for granted	0	0	4	2	1	7
	It does not matter	1	0	2	0	0	3
	Can be tolerated	0	0	0	1	0	1
Total		2	1	7	22	17	49

6. 45% of the people can tolerate it when the downloads are slowly at the library and 35% dislikes it. But 78% likes it when the downloads are quickly.

Count

		If the library could not provide a quiet space to complete personal					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If the library could provide a quiet space to complete personal	I like very much	1	2	6	11	14	34
	Take it for granted	0	1	0	0	6	7
	It does not matter	1	1	5	0	0	7
	Can be tolerated	0	0	0	1	0	1
Total		2	4	11	12	20	49

7. The library offers enough quiet places to complete personal activities for each user, says 69% of the students. And for 59% of the students it is not a problem when there are not enough quiet places at the library but 41% dislike it.

Count

		If the overall environment is not comfortable and attractive how					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If the overall environment is comfortable and attractive how	I like very much	1	1	2	15	17	36
	Take it for granted	0	1	2	1	2	6
	It does not matter	0	2	2	0	0	4
	Can be tolerated	1	0	1	1	0	3
Total		2	4	7	17	19	49

8. The overall environment is pretty important for most students because 73% of them like a comfortable and attractive environment at the library. But the dislike for having no comfortable and attractive environment is not very big, it is just 38%.

Count

		If there is not enough place for students to study how would you					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If there is enough place for students to study how would you	I like very much	1	2	0	14	18	35
	Take it for granted	0	0	3	2	4	9
	It does not matter	0	0	2	1	0	3
	Can be tolerated	0	0	1	1	0	2
Total		1	2	6	18	22	49

9. Most of the students (71%) like it when there are enough places to study in the library. On the other hand, the dislike when there are not enough places is not even half of the students, it is just 45%.

Count

		If there is not Fika place to have some drinks or snacks how					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If there is Fika place to have some drinks or snacks how	I like very much	0	3	17	5	4	29
	Take it for granted	1	1	3	4	1	10
	It does not matter	1	1	6	0	0	8
	Can be tolerated	0	1	1	0	0	2
Total		2	6	27	9	5	49

10. The traditional Fika is not very important for the students who visit the library. Only 10% of the students dislike it when there is nothing to eat or drink. For the other 90% it is fine that there is not.

Count		If there is no some plant to relax how would you feel like					Total
		I like very much	Take it for granted	It does not matter	Can be tolerated	Dislike	
If there is some plant to relax how would you feel like	I like very much	1	1	16	5	8	31
	Take it for granted	0	0	6	1	0	7
	It does not matter	0	2	6	0	0	8
	Can be tolerated	0	0	1	1	0	2
	Dislike	1	0	0	0	0	1
Total		2	3	29	7	8	49

11. Same here as for the Fika, students (63%) like it when there are some plants but they don't miss it when there are none (84%).

**What is your gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	26	52,0	53,1	53,1
	Male	23	46,0	46,9	100,0
	Total	49	98,0	100,0	
Missing	System	1	2,0		
Total		50	100,0		

12. 53% of the students who filled in the survey are female and 47% is male.

**What is your age**

N	Valid	49
	Missing	1
Mean		23,551

13. The average age of students who filled in the survey is 23,5 years old.

**What is your age**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18,0	1	2,0	2,0	2,0
	19,0	1	2,0	2,0	4,1
	20,0	6	12,0	12,2	16,3
	21,0	8	16,0	16,3	32,7
	22,0	6	12,0	12,2	44,9
	23,0	8	16,0	16,3	61,2
	24,0	5	10,0	10,2	71,4
	25,0	3	6,0	6,1	77,6
	26,0	1	2,0	2,0	79,6
	27,0	3	6,0	6,1	85,7
	28,0	3	6,0	6,1	91,8
	29,0	1	2,0	2,0	93,9
	31,0	1	2,0	2,0	95,9
	32,0	1	2,0	2,0	98,0
	35,0	1	2,0	2,0	100,0
	Total		49	98,0	100,0
Missing	System	1	2,0		
Total		50	100,0		

### 3.2.2 Questionnaire reliability and validity analysis

#### 3.2.2.1 Analysis of Questionnaire Reliability

The questionnaire's reliability refers to the consistency of the research. So if you do the research again at another time it will have the same results as now.

The reliability of the questionnaire is good because the research was about international students who studies in Sweden and all of the filled in questionnaires are from students from Swedish universities. We have the results of 11 different Swedish universities all over Sweden, from Lund in the south till Umea in the north.

#### 3.2.2.2 Questionnaire validity analysis

The questionnaire's validity means that the right questions were asked in the questionnaire.

The validity of the questionnaire is not good because for a valid survey 200 survey answers are needed instead of the 49 collected now.

### 3.3 Questionnaire data processing

#### 3.3.1 Quality of service elements classification results

Kano model categories	Which questions fits which category?
<b>Must-be quality (M)</b>	
<b>One-dimensional quality (O)</b>	1, 3, 4, 5,7,8,9
<b>Attractive quality (A)</b>	2, 6, 10,11
<b>Indifferent quality (I)</b>	12, 13

#### **IV. Research conclusions and insufficient**

According to the quality of service elements classification result of the grouping, we can help the college libraries to improve the satisfaction of the readers from the specific way.

In terms of the one-dimensional quality, there are 7 index from 3 dimension. Most of them are focus on the index called Information control. So that we could see the expectations of library resources and environmental needs, which means the libraries could continue to improve the demand in this area.

As for the attractive quality, there are 4 index from two dimension. Among them, the readers are more concerned about the index named Library as a Place, such as Fika place and more plants. That means the university library to meet the basic needs of the library under the circumstances of the positive development of this thing can greatly improve customer satisfaction. (Piao Shi bo, Research on the Application of Kano Model in Reader Satisfaction of University Library, p.113) In Sweden, Fika is like a culture, which could help the students from the different countries to create a good atmosphere for communication and international students better into Sweden. Also, from our own experience, the Swedish library provides drinking water are cold water, which for many international students do not adapt. Fika's existence can also solve this problem.

The lack of the article mainly exists in the following two aspects: (1) The number of samples is insufficient. As for the research area is the whole Sweden university's library, we just got 49 samples. Although the respondent are from the different university, do not means they are representative and cannot avoid that too subjective answers affect the effectiveness of the questionnaire. (2) Questionnaire improvement is not reasonable. When we optimized the LibQUAL+™ model index, we delete some questions that we think are not important, which leads to there is no question in the Must-be quality in the results of quality of service elements classification results. This is obviously unreasonable.

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