Integration of Servqual, Kano Model, and QFD to Design Improvement on Public Service System

A Mansur¹, A N Farah¹ and W N Cahyo¹
¹Department of Industrial Engineering, Universitas Islam Indonesia, Jl. Kaliurang km 14.4, Sleman, Yogyakarta, Indonesia.

agusmansur@uii.ac.id

Abstract. Customer satisfaction can be affected by the quality of service. Based on the results of a preliminary observation, it was found that there were many complaints about quality of service in the “x” sub-district. The aims of this research are to improve quality of service in “x” sub-district with integration of Servqual methods, Kano model, and QFD. In Servqual method, it is assumed that if attributes with low satisfaction score improved, it will improve the consumer satisfaction. However, not all improvement in the attributes of the quality of service will increase the consumer satisfaction. Therefore, the Servqual method will be combined with the Kano method to find the primary attributes to improve according to the relationship to the consumer satisfaction. While QFD is used to determine the priority of improvements. From the research results, there were 14 attributes required to improve and the main priority for improvement is to design official website of “x” sub-district.

1. Introduction

The quality of a service can be reflected from the conditions between users and the service providers. If the expectations of the customer are fulfilled by the service provider, then customers’ judgement on the quality of service is generally positive, because it will provide satisfaction to customers. Conversely, if the service provider does not meet the expectations of consumer, then the service is not good because it could not satisfy the customers [1].

Sub-district “X” is one of the government administration office intended to carry out public services. Based on the results of preliminary observations and interviews, it was found that there were a significant number of complaints about the quality of service in the sub-district. There are approximately 90% of the correspondence complained about the service and the rest said that they do not have any complaints and were satisfied with the services. The complains can be categorized as follows:
1. Most of the services were accomplished (settlement time) beyond the standard time. The customers consider the service at the office is slow. The detail is shown in Table 1.

| No | Type of Service | Standard Time | The Fact of Settlement Time |
|----|----------------|---------------|-----------------------------|
| 1  | Identity Card  | 2 weeks       | 1 month                     |
| 2  | Family Card    | 1 – 2 days    | 5 – 7 days                  |
2. Service facilities are considered incomplete. It is indicated by the fact such as the unavailability of the identity card printing machine, broken photo machine, and inactive family card online system.

3. In terms of service procedures, there are many people who do not understand the workflow of the service procedures and service conditions due to lack of socialization in the community.

Some previous researches in this area are presented by [2][3][4][5]. In [2], the authors observe to determine strategy to increase customer satisfaction PT. Telkomsel Bali-Nusra region with Servqual and QFD method. A study also conducted by [3] to analyze quality of service with Servqual method in Tenggarong sub-district. In [4], the authors conducted research at PT. PLN UPJ South Semarang with Servqual method and Kano model. Also, [5] conducted research to improve service and customer satisfaction at PT. PLN Malang with an integration of QFD and Servqual. Based on the problems faced by Sub-district X, it is argued that to improve the quality of service of the sub-district, integration of Servqual methods, KANO, and QFD can be applied. The combination of those three has been applied in tourism industry by.

2. Literature Review

2.1. Servqual

Servqual is a method used to measure the gap between expected services and perceived service [6]. Many researches have been applied using Servqual such in [7][8][9][10][11]. The aim is to compare the quality of service expected by customers with the quality of service received by customers. To assess the quality of service (Q) can be formulated as follows [12]:

\[ Q = P - E \] (1)

Where:
- Q : The quality of service
- P : Perceived service
- E : Expected service

According to [13], dimensions of the quality of service are divided into five dimensions: reliability, assurance, tangible, empathy and responsiveness. Explanations for each dimension are as follows [14]:

a. **Tangible**: includes the performance of physical facilities, tools, and appearance of the employees.

b. **Reliability**: the ability to carry out the service as promised accurately and dependable.

c. **Responsiveness**: the desire to help customers and provide fast service.

d. **Assurance**: the employee’s knowledge and the ability to deliver trust and confidence.

e. **Empathy**: care and attention to each customer.

2.2. Kano

The Kano model was developed by Dr. Noriaki Kano and his colleagues in 1984 to categorize product or service attributes into five categories based on how well these attributes can satisfy customer needs [14]. The Kano model classifies service attribute criteria into five different categories [15]:

a. **Must be**: Customers will be disappointed if the performance of service attributes is low or service attributes are removed. But it will not provide excessive satisfaction by improving the performance of service attributes.

b. **One-dimensional**: If the service attribute performance is high, then the level of customer satisfaction will increase. Otherwise, if the performance of service attributes is low, the level of customer satisfaction will decrease.

c. **Attractive**: Customer satisfaction will increase significantly with the increase of service attributes performance. But a decrease in customer satisfaction will coincide with a decrease in the performance of its service attributes. However, customers will not be disappointed if the service attribute is not provided.
d. Indifference: These categories have little influence on customer satisfaction. For the indifference category, customer satisfaction will not be affected by the performance of the service attributes.

e. Reverse: customers are dissatisfied with the increasing performance of service attributes.

The Kano model categorizes service attributes through two types of questionnaires. The first questionnaire asks consumers feelings if service attributes can be fulfilled, while the second questionnaire asks consumers’ feelings if the attributes cannot be fulfilled [16]. After that, the results of the questionnaire will be analyzed with the Kano classification table. Kano Scoring for each category as follows: 4=attractive, 2=one dimensional, and 1=must be [17]. Kano classification matrix can be seen in Table 2 [12]:

| Positive Questions | Happy | Must-be | Indifference | Acceptable | Unhappy |
|--------------------|-------|---------|--------------|------------|---------|
| Happy              | Q     | A       | A            | A          | O       |
| Must-be            | R     | I       | I            | I          | M       |
| Indifference       | R     | I       | I            | I          | M       |
| Acceptable         | R     | I       | I            | I          | M       |
| Unhappy            | R     | R       | R            | R          | Q       |

2.3. QFD

QFD was developed in Japan by Yoji Akao in 1972 [14]. QFD (quality function deployment) is one of the quality tools used to improve customer satisfaction by translating customer needs into technical needs. In addition, QFD is also used to provide innovation in order to increase customer satisfaction.

The most important part in QFD is building a house of quality (HOQ). The function of HOQ is to become a product planning matrix consisting of customer needs, technical needs, and competitor analysis. In short, HOQ provides information about setting targets and priority improvements [18]. HOQ is one matrix of the QFD method that is used to translate customer needs into technical requirements that must be met. HOQ creation consists of seven steps:

1. Define customer need (what’s)
2. Define Final Weight of Importance level
3. Competitive assessment
4. Determine technical response (how’s)
5. Make a relationship matrix
6. Make a correlation matrix
7. Determine the target value

3. Research Methodology

In this research, service attributes were obtained from the interviews with the employees of the sub-district and customers who had received services at the sub-district. From the interview results, there are 33 service attributes used in this research questionnaire. Then, the questionnaire is divided into 2 types: (1) Servqual questionnaire, and (2) Kano questionnaire. Both questionnaires are distributed to 100 respondents based on the result of calculation in Slovin formula. Furthermore, the validity and reliability tests are conducted on the answers to the questionnaires.
The result of both questionnaires then is integrated to the data processing of Servqual questionnaire and Kano questionnaire to determine final weight of importance level. Integration of Servqual and Kano can change the Final weight of importance level which affect the priority order of service attributes that need to be improved using QFD. The detailed research flow shown in Figure 1:

4. Result and Discussion

4.1. ServQual Method
In SerQual, there are two kind of categories, strong and weak category. Attributes in strong category are attributes with positive gap score (+). It means that perceived service is greater than expected services. There are 17 attributes in the strong category and 14 attributes in the weak category. Reversely, Attributes that have a negative gap score (-) are categorized into weak category which means that expected services are greater than perceived service.

4.2. Kano Model
In the Kano model, the attributes are categorized based on the relationship between the level of customer satisfaction and the level of fulfillment of service attributes. The purpose of this process is to find out the impact of each attribute in meeting the customer satisfaction. Based on the results of the Kano Questionnaire in this research, the following result are obtained:

a. There are 11 attributes categorized into the attractive category (A),

Attributes in the attractive category can significantly increase customer satisfaction. For this reason, the management or decision maker in the sub-district is suggested to pay more attention in the
continues improvement on these attributes. In other words, the improvement of a sufficient stage of these attributes is necessary to improve customer satisfaction.

b. There are 15 attributes categorized into the one-dimensional category (O). The nature of the attributes in this category is positively related to the customer satisfaction. If the attributes are fulfilled, it will increase the customer satisfaction. On the other hand, if it is not fulfilled then customer satisfaction decreases and consumers disappointed. Therefore, the service provider must pay attention to the attributes in this category because if it is not fulfilled the consumer will feel disappointed.

c. In the Must-Be category (M), 4 attributes are located. The attributes included in this category are basic criteria that must be fulfilled by the company. If this category is fulfilled, it will not increase customer satisfaction, but if it is not fulfilled, consumers will feel disappointed. So that the attributes which belong to this category must be maintained, but only to what the customer wants, so that the available resources are not wasted and can be used to improve other attributes in A and O categories.

d. There is 1 attribute belongs to the indifference category (I), This category has little effect on customer satisfaction. So, the attribute that belong in this category is not considered because they do not affect (or has insignificant effect) to the customer satisfaction.

4.3. Integrated Servqual Methods and Kano Model into QFD

The customer need or attributes required to improve are the attributes categorized in the “weak” category, while attributes in the “strength” category should be maintained accordingly [10]. The Kano model is used to categorize service attributes based on their influence on customer satisfaction. Therefore, the Servqual method needs to be integrated with the Kano model to provide added value so that QFD implementation is effective. The attributes need to be improved (customer needs) are service attributes with negative gap score and are included in the Kano categories A (attractive), O (one-dimensional), and M (must be). From the results of data processing, there are 14 attributes that need improvement.

The integration point of these three methods is to determine the final weight of the importance level by integrating the weight of Servqual and the score from Kano. The weight of Servqual is obtained from servqual questionnaire, while Kano’s score is obtained from the Kano questionnaire. The Final Weight of Importance Level can be calculated using the formula [14] in (2) and (3):

\[
\text{The weight of Servqual} = \text{Gap score} \times \text{Importance of the Quality of Service} \quad (2)
\]

\[
\text{Final Weight of Importance Level} = \text{Weight of Servqual} \times \text{Kano Score} \quad (3)
\]

The result of the combination of Servqual and Kano is then presented into a House of Quality (HOQ) as shown in Figure 2. From the results of data processing with the house of quality, priority improvement of quality of service in the sub-district office can be seen in the weight of technical response. The service providers are expected to consider improving the customer satisfaction based on the weight of the technical response. Based on Figure 2, the highest priority to meet the consumer needs is to design the official website of the sub-district based on the weight of the technical response. According to this result, a website to provide the customer with the necessary information is designed.
4.4. Design Website of “x” sub-district

Design prototype website of sub-district X is made using blogger with HTML language. Website creation aims to improve the quality of service in the sub-district office. With the existence of this website, the community is expected to feel the ease of service because they can directly access the information that is needed in the service. Based on Figure 3, there are several menus bar that available on the website including Home, Profile, Information, Public Service, Order Status, Terms and Procedures, Gallery, Guest Book, and Contact Us.

In addition, people who place order of administration service can monitor orders through an order system that is carried out through the Order Status Menu. Order Status is integrated directly with Google spreadsheet. The example of the order status can be seen in Figure 4.

**Figure 3.** Design website “x”-subdistrict
5. Conclusion

In this research, a combined Serqual, Kano and QFD model is developed. The combination of the three approaches is capable to direct to a propose solution to increase the satisfaction of the customer. From the process of Servqual and Kano, attributes required for the development of better service are identified. There are 14 attributes that need to be improved. The result of the QFD model shows that it is recommended to develop a website of the institution in order to deliver better service from the point of view of the customers. So, the main priority for improvements of quality of service at “x” sub-district is to design the official website that is integrated with order information system. A design of the website is also developed in this research. The main feature requested by the customer in the website is to see the status of their requested document.

For the future research, a more detail design of the website can be developed along with the app provided in different OS such as in playstore and Appstore in order to provide a wider range of information to the community. Also, after the website has been established, it is necessary to survey once again the satisfaction of the customer.

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