Service Quality Improvement by Using the Quality Function Deployment (QFD) Method at the Government General Hospital

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Abstract. In the face of increasingly competitive competition in the hospital industry, RSU managers are required to be able to develop strategies, policies or new breakthroughs related to improving the quality of their services, through improving the characteristics of hospital services, which focus on patient needs, so that the risk of errors or discrepancies between service characteristics that are enhanced by what the patient wants can be avoided or minimized. From the results of research conducted there are 21 variables of patient needs from a health service at the Government General Hospital (RSU). Whereas the patient's research on the service quality of the Government Hospital is 1 variable that has fulfilled the needs of patients, namely that they are satisfied with the quality of hospital services. Variable is the state and completeness of modern medical facilities. Whereas for other variables there are gaps so that they cannot meet patient expectations until the highest quality limit is very satisfied, it is necessary to have a direction of improvement. To obtain the suitability, the technique used to improve the characteristics of the service is the application of the QFD method. The QFD method in this study is in the form of a quality service matrix at the Government General Hospital. From the HOQ matrix, the service quality of the Government Hospital is obtained from the input of the Government Hospital/management that there are priority variables needed to improve their quality, which is generally the patient's needs related to the recovery of patients, including the knowledge and abilities of doctors, medicines the treatment given in the healing of patients, the service of examination, treatment and care that is fast and precise, guarantee of security and trust in the services provided and the completeness of the readiness and cleanliness of the equipment used. So there are 33 service quality characteristics prioritized for further improvement, with the main priority being patient recovery.
1. Introduction

The hospital is one type of industry that moves in the service sector. The offer provided consists of a principal service accompanied by additional (complementary) services or supporting items. In this category, the main offer is service, but during processing time, the service is related to physical elements, such as food, drinks, facilities provided and so on.

With increasing public awareness of the importance of health problems, the services provided by the hospital have received serious attention from the community and related government agencies. The level of health of the population in a country reflects the country's progress and prosperity. Therefore, the quality of services provided by a hospital as one of the service industries engaged in health, should receive serious attention from consumers. Consumers in this case are patients, who are critical enough to assess the quality of hospital services[1].

One technique that can help hospital managers/leaders in developing plans for improving their service characteristics in accordance with patients' desires is to use the Quality Function Deployment (QFD) matrix method. QFD will translate what customers need (in this study the hospital customers are patients) to what the hospital should produce. QFD allows hospitals to prioritize customer needs, find innovative responses to these needs and improve processes to achieve maximum effectiveness[2].

2. Research Objectives

a. Identifying the patient's needs for the quality of hospital health services.
b. Provide an overview to the RSU management/management to the extent that patients assess the quality of hospital services at this time.
c. So that the RSU management/management can find out the main priorities of the variable patient needs that are planned to be fulfilled or fulfilled, in relation to the planning process of improving the quality of service to patients in the future and can find out the main priorities of service characteristics that need to be further improved. in relation to realizing the variables of patient needs that have been prioritized to be fulfilled or fulfilled in the future.

3. Theoretical Basis

The word quality has many different definitions and varies from conventional to strategic. Conventional definition of quality usually describes the direct characteristics of a product, such as performance (performance), reliability (reliability), easy to use (ease of use), aesthetics, and so on. And according to the definition of strategic, quality is everything that is able to meet the wants or needs of customers (meeting the needs of customers)[3].

In Din ISO 8402 the quality is defined as the totality of the form and characteristics of an item or service, which contains at the same time an understanding of security or the fulfillment of the needs of users [4]. Quality is often interpreted as customer satisfaction or conformance to needs or requirements (conformance to the requirement). The definition of a product can be tangible, intangible, or a combination of both. Thus there are three categories of products in question, namely: (1) goods (goods), such as cars, computers, tires, etc.; (2) software (software), such as computer programs, and (3) services (services), such as banking, insurance, hospitals, and so on. Based on the definitions that have been raised about quality, both conventional and more strategic, it can be concluded that basically this quality is always focused on customers (customer focused quality). Thus products are designed, manufactured, and services provided to meet customer needs, desires, and expectations, so that the product can satisfy them.

In essence, business goals are to create and maintain customers [5]. In the Total Quality Management (TQM) approach, quality is determined by the customer. Therefore, only by understanding the process and customers can a company realize and appreciate the meaning of quality. All management efforts in TQM are directed to one main goal, namely the creation of customer satisfaction. Whatever management does will not do any good if it ultimately does not
result in increased customer satisfaction. The existence of customer satisfaction can provide benefits [6], including:

a. The relationship between the company and its customers becomes harmonious.
b. Providing a good basis for repurchase.
c. Can encourage customer loyalty.
d. Establish a word of mouth recommendation that is beneficial for the company.
e. The company's reputation is good in the eyes of customers.
f. Earnings can increase.

4. Identify Customer Needs

The customer is the person who receives the results of the work of someone or a company, so only they can determine the quality as what they are and only those who can convey what and how they need. This is why the popular quality movement slogan reads "quality starts from the customer" [7]. Every person in the company must work with internal, external, and customer customers to determine their needs. In the TQM approach, customer needs are clearly identified as part of product development. The goal is to exceed customer expectations, not just fulfill them. For this reason, accurate information regarding customer needs and desires for the products produced by the company is needed. Thus the company can understand well the behavior of consumers in the target market, so that the company concerned can develop the right strategies and programs in order to take advantage of the opportunities that exist, establish relationships with each customer, and outperform its competitors [8].

The main key to identifying internal customer needs is continuous communication between employees who are interrelated and dependent on each other as individuals, and between departments that are interdependent as a unit. In this communication, each party conveys their needs to the other party, so that mutual understanding and cooperation between individuals and between departments within the company are involved. To encourage and facilitate such communication, quality mechanisms, self-managed teams, inter-departmental teams and improvement teams [9] can be used.

Continuous communication with external customers is also very important. One reason for the need for continuous communication is that customer needs change over time and even changes can take place very quickly. Through this communication the company can monitor any developments and changes that occur. If this is not anticipated, the company can lose in competition. The factors that led to the emergence of new customer needs were new technologies, market competition, changes in tastes, social upheaval, and international conflicts[10].

Satisfaction Referring to the Implementation of All Health Service Requirements

Here a measure of patient satisfaction is associated with the application of all health care requirements. A health service is referred to as quality health services if the application of all health care requirements can satisfy patients[11]. With this opinion, it is easy to understand that the quality measures of health services are broad, because they include an assessment of patient satisfaction regarding:

a. Availability of Health Services (Available)
b. Fairness of Appropriate Health Services
c. Continuity of Health Services (Continue)
d. Acceptance of Health Services (Acceptable)
e. Achievement of Health Services (Accessible)
f. Affordability of Health Services (Affordable)
g. Health Service Efficiency (Efficient)
h. Quality of Health Services (Quality)

Quality Function Deployment (QFD) Method

Quality Function Deployment (QFD) was first developed in 1972 by Mitsubishi’s Shipyards in Kobe, Japan. The essence of QFD is a large matrix that will connect what the customer wants
(WHAT) and how a product will be designed and produced to meet the customer's desire (HOW) [12].

The main focus of QFD is to involve customers in the product development process as early as possible, where their needs and desires are used as the starting point of the QFD process [13]. And therefore the QFD is referred to as the voice of the customer. The underlying philosophy is that customers will not be satisfied with a product, even if a product has been produced perfectly, if they do not want or need it.

The QFD concept uses a detailed chart to translate quality perceptions into product characteristics, which are then used as requirements for the engineering and production stages. The basic design tool is a chart called House of Quality. The design begins with conducting marketing research to determine specific product attributes that customers want from a predetermined market segment, the relative importance of each attribute, and determining customer perceptions of competing products and company products in each of the attributes.

![Figure 1. House of Quality](image)

A quality house is a picture of a set of matrices that interact with one another, as shown in Figure 1. Figure 1 can provide information about: (1) Customer needs in the form of customer needs and desires of a product or service, (2) Technical response in the form of what and how can be done by the company for this, (3) The influence of technical response on customer needs (relationship) in the form of technical response to customer satisfaction, (4) Planning matrix, in the form of methods for building strategies for customer satisfaction and comparing products or services themselves to meet the needs of customers with competitors) or negative influence (contradictory), (6) Technical matrix (technical matrix) consists of determining technical responses that contribute greatly to customer satisfaction, competitive assessments and determining technical response targets based on the performance of technical responses from competitors.

5. Research Methodology

Test Validity and Reliability

Correlation calculations for each variable with a total score using the "product moment" correlation technique formula as follows:

\[
r = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{n \sum X^2 - (\sum X)^2} \sqrt{n \sum Y^2 - (\sum Y)^2}}
\]

Information:
- \(X\) = Score of each variable
- \(Y\) = total score of each respondent
- \(N\) = Number of respondents

The way to see the critical number is to look at line N-2 in the correlation table of the r-value, for example for the significant level of 5%, \(N = 25\) (df = 23), a critical value of \(r = 0.396\) will be obtained, so the variable will be declared valid if the value of \(r\) is greater than 0.396.

Validity and reliability testing is the process of testing the questions in a questionnaire, whether the contents of the questions are valid and reliable. If the items are valid and reliable, it means
that the items can be used to measure the factors. The next step is to test whether the factors are valid to measure the existing construct.

Table 1. Determination of the Sample Amount of Each Level

| Level | Inf. | Number of patients | Number (%) | Number of sample |
|-------|------|--------------------|------------|-----------------|
| 1     | VIP  | 200                | 20.00      | 20.00 ≈ 20     |
| 2     | Class I | 227              | 22.70      | 22.70 ≈ 23     |
| 3     | Class I | 320                | 32.00      | 32.00 ≈ 32     |
| 4     | Class II | 169               | 16.90      | 16.90 ≈ 17     |
| 5     | Class III | 84                | 8.40       | 8.40 ≈ 8       |
| Total |      | 1000              | 100        | 100             |

The total value of the level of importance of a variable is calculated from the results of the multiplication of the respondent's answer to the measurement scale (Likert scale). The Likert scale value for the level of importance is as follows:
- SP = Very Important = 5
- P = Important = 4
- CP = Quite Important = 3
- KP = Less Important = 2
- TP = Not Important = 1

The total value of the service level of a variable is calculated from the multiplication of the number of respondents with the measurement scale (Likert scale). The Likert scale value for the service level is as follows:
- SB = Very Good = 5
- B = Good = 4
- CB = Good enough = 3
- KB = Poor = 2
- TB = Not Good = 1

The results of the processing of questionnaire data in sections I and II can be obtained by showing the gap between the level of interest of patients and the level of service in the hospital. This gap shows that hospital services on a variable needs are not in accordance with patient expectations (level of importance). To find out this gap, the mode of importance and service level of each variable is used.

Table 2. Total Value of Data on the Importance of Variables in Patient Needs

| No | Variable Patient Needs | SP | P | CP | KP | TP | TN |
|----|------------------------|----|---|----|----|----|----|
| 1  | Complete and modern state and completeness of medical facilities | 31 | 46 | 23 | 0  | 0  | 408|
| 2  | Patient inpatient room condition | 50 | 35 | 15 | 0  | 0  | 435|
| 3  | Food quality | 53 | 26 | 21 | 0  | 0  | 432|
| 4  | Completeness, readiness and cleanliness of the equipment used | 43 | 43 | 14 | 0  | 0  | 429|
| 5  | Appearance of doctors and hospital nurses | 56 | 37 | 7  | 0  | 0  | 449|
| 6  | Service procedures are not complicated | 62 | 34 | 2  | 0  | 0  | 452|
| 7  | Accuracy of medical services provided to patients | 59 | 40 | 1  | 0  | 0  | 458|
| 8  | Service schedules are implemented correctly | 64 | 36 | 0  | 0  | 0  | 464|
| 9  | Inspection, treatment and care services that are fast and precise | 62 | 38 | 0  | 0  | 0  | 462|
| 10 | Alertness of personnel in handling patients | 64 | 35 | 1  | 0  | 0  | 463|
| 11 | Dexterity in handling patient complaints immediately | 62 | 37 | 1  | 0  | 0  | 461|
| 12 | The doctor provides clear, precise & easy to understand information | 65 | 32 | 3  | 0  | 0  | 462|
| 13 | Complete and modern health & support facilities and medical facilities | 62 | 30 | 8  | 0  | 0  | 454|
| 14 | The skills of doctors and nurses at work | 60 | 40 | 0  | 0  | 0  | 460|
| 15 | Attitudes of hospital doctors and nurses (hospitality, courtesy) | 64 | 36 | 0  | 0  | 0  | 464|
| 16 | Ease of obtaining drugs | 80 | 20 | 0  | 0  | 0  | 480|
| 17 | Medications that are given effectively in helping patients recover | 82 | 17 | 1  | 0  | 0  | 481|
| 18 | Ease of contacting the hospital (by land or telephone transportation) | 87 | 12 | 3  | 0  | 0  | 474|
| 19 | The doctor's willingness to give advice | 86 | 12 | 2  | 0  | 0  | 484|
| 20 | The willingness of nurses to provide information | 61 | 32 | 7  | 0  | 0  | 454|
| 21 | Visite is a routine doctor | 48 | 48 | 4  | 0  | 0  | 438|

Note: TN = Total Value of Interest
6. Analysis

Application of QFD Method Efforts to Improve Service Quality of Government Hospitals

In the process of improving the quality of hospital services, not all variables of patient needs can be met at once, but must be gradually and adjusted to planning priorities. This is due to the limitations of the hospital, both in terms of funds, human resources, time, environmental conditions, and so forth.

As a tool used to carry out the process of improving the quality of hospital services, the QFD method is used. The application of the QFD method in this study only arrived at the first stage, namely the stage of the formation of the House Of Quality (HOQ) matrix. In the process of building a HOQ matrix, there are several steps that must be taken in the process of building the HOQ matrix to improve the quality of RSU services. Based on the dimensions of quality used.

1. Tangible dimensions (physical evidence), the patient considers it very important for a hospital service to pay attention to the condition of the patient's inpatient room, the quality of the food served, the cleanliness and completeness of the equipment used and the appearance of hospital doctors and nurses. In addition, patients assume that the state and completeness of modern medical facilities are also important to note from a hospital service.

2. Dimension of Reliability (reliability), the patient considers it very important for the hospital to pay attention to its non-convoluted service procedures, accuracy of medical services provided to patients, accuracy of service schedules, and prompt and appropriate examination, treatment and care services provided to patient.

3. Responsiveness Dimensions, each patient is looking forward to hospital services so that personnel are quick in handling patients and handling patient complaints immediately.

4. Dimensions of Assurance, patients consider very important for hospitals for the accuracy of medical services provided to patients, complete & modern health & support services and medical facilities, the skills of doctors and nurses at work, attitudes of doctors and nurses obtaining drugs and medicines that are given is very effective in helping healing patients, because all these things are considered very important by the patient.

5. Emphaty dimension, the patient really hopes for a hospital service in order to really pay attention to the ability of doctors and nurses in conveying information, routine visite doctrine. In addition, patients also assume that the ease of contacting the hospital is also important to note from a hospital service.

House of Quality Matrix Analysis Characteristics of RSU Service Services

1. Planning Matrix Analysis

As a basis for making these decisions, there are 4 interval classes that will be used as criteria to determine whether a need is "very important", "important", "important enough", or "less important" for the planning focus. Decisions about the priority variables to be fulfilled are those that meet the criteria of "important" and "very important". The values in the class interval are in the form of the relative importance of the variable needs.
2. Identification of Service Characteristics
3. Identification of Levels of Relative Interest in

7. Conclusion
1. Patients can be grouped into 5 strata based on the type of treatment room, namely patients who have felt the service to VIP, patients who have felt service in class I, patients who have felt service in class II, patients who have felt service in class III.
2. Of the 21 variables used to improve the quality of public hospitals, there are 9 needs variables as the main priority that needs to be improved, namely the knowledge/expertise of doctors in determining medicines, skills/skills of doctors, appropriate treatment measures, effective and efficient medical actions, speed of taking action/decision, completeness, readiness and cleanliness of the tools used, personnel alertness in handling patient complaints, personnel attention to patients, and the ability of doctors and nurses to behave, providing clear, precise and easy to understand information.
3. In relation to the 9 priority variables needed to improve service quality there are 33 service characteristics that need to be improved.
4. Facility service characteristics that need to be improved in realizing quality improvement efforts are complete medical equipment and modren.
5. To support efforts to improve quality, personnel service characteristics must be improved. The characteristics that need to be improved in this case are the quick handling of patients, coming soon when needed, cultivating therapeutic communication with patients, being friendly to patients, patience of personnel, proactively civilizing, and being fair with patients.

REFERENCES
[1] N. Cross, Engineering Design Methods : Strategies for Product Planning. New York: John Wiley & Sons Ltd, 1989.
[2] L. Cohen, Quality Function Deployment : How to Make QFD Work for You. Massachusetts: Addison – Wesley Publishing Company, 1995.
[3] S. Santoso, Buku Latihan SPSS : Statistik Parametrik. Jakarta: PT. Elex Media Komputindo, 2000.
[4] H. Umar, Riset Pemasaran dan Perilaku Konsumen. Jakarta: PT. Gramedia Pustaka Utama, 2000.
[5] A. Azwar, Pengantar Administrasi Kesehatan. Jakarta: Binarupa Aksara, 1996.
[6] F. Tjiptono, Total Quality Manajemen. Yogyakarta: Andi Offset, 2000.
[7] A. Azwar, Menjaga Mutu Pelayanan Kesehatan. Jakarta: Pustaka Sinar Harapan, 1996.
[8] S. Arikunto, Prosedur Penelitian : Suatu Pendekatan Praktek. Jakarta: PT. Rineka Cipta, 1996.
[9] D. S. Ermer and M. K. Kniper, “Quality Function Deployment for Quality Service Design,” J. Total Qual. Manag., 1998.
[10] et al Dergibson, Sugiarito, Teknik Sampling. Jakarta: PT. Gramedia Pustaka Utama, 2001.
[11] F. Tjiptono, Prinsip-Prinsip Total Quality Service. Yogyakarta: Andi Offset, 1997.
[12] M. Singarimbun and S. Effendi, Metode Penelitian Survei. Jakarta: LP3ES, 1989.
[13] V. Gaspert, Penerapan Konsep-konsep Kualitas dalam Manajemen Bisnis Total. Jakarta: PT. Gramedia Pustaka Utama, 1997.