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The Effect of Service Quality on Financial Expectations with a Return on Quality Approach at Hospital X Sidoarjo

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A B S T R A C T

One of the efforts of the hospital management to find out, understand, and fulfil the needs and desires of consumers, is to make improvements to the quality programs carried out. However, not all quality improvement programs benefit the management, as many of these improvement programs are wasteful after being implemented. This inefficiency occurs as the management did not determine the most significant variables of the quality improvement program. This study discusses the efforts of Hospital X to plan a quality improvement program by considering the wishes and needs of patients, selecting and determining the most influencing variables/dimensions to be carried out, and assessing financial feasibility using the Return on Quality approach. ROQ). From the ROQ implementation at Hospital X Sidoarjo, two quality improvement programs from the two dimensions of the hospital service process, namely beds and patient registration, were determined. The ROQ value of each program based on the discount rate (5%, 10%, 15%) is 1.54; 0.99; 0.49 for the inpatient room service process, and 1.25; 0.61; 0.24 for the front office and administration services. For this reason, the dimension that is the focus of the quality improvement program is the inpatient room service process with the dimensions of the bed.

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1. Introduction

Intense competition between hospitals in Sidoarjo Regency in providing services for consumers (patients) is a big challenge for the hospital management to provide services according to the customers' needs and desires. The goal is to meet the customer's satisfaction, for example, with fast, accurate, friendly, and affordable services (Fandy Tjiptono, 2014). This goal is the reason for the hospital management to improve the previously conducted quality program. However, not all of these improvement programs will benefit the management as many of these repair programs are not efficient after being implemented. The failure happened because the management did not determine the most significant variables needed for the quality improvement program.

At Hospital X, complaints are often found from patients about the services provided, for example, a slow response at the service counter and the inconvenience of services in the inpatient

room. In line with the purpose to improve the service quality, this study discusses the hospital's efforts in planning a quality improvement program according to the wishes and needs of patients by selecting and determining the most influential variables or dimensions quality improvement program to be carried out, as well as assessing its financial feasibility by using Return on Quality (ROQ) approach. (Rust, 2002).

2. Literature Review

ROQ (Return on Quality)

According to (Rust, 2015), the quality improvement program carried out by the company can be measured or calculated financially in order to know the level of need and strength of the company financially and in improving the quality of products/services better by paying attention to customer satisfaction regarding the price of the product/services provided, thereby affecting the company's market share and determining the ROQ value that can be used as a consideration for the management to make a decision, primarily related to investment in quality improvement programs writing references using the APA model.

Focus of ROQ:

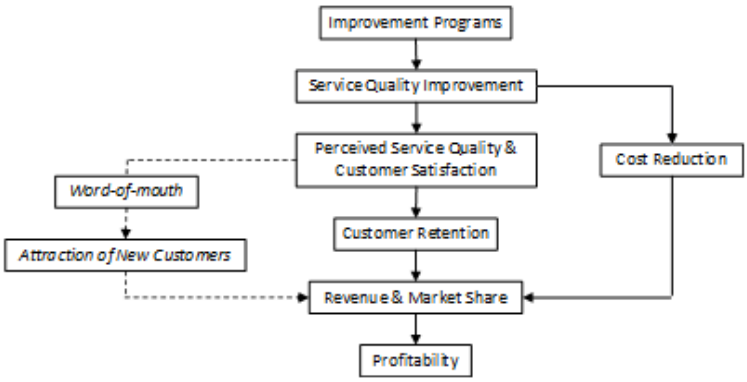

Figure 1. Service Quality Improvement and Profitability relationship model

ROQ provides input for companies to be able to make decisions in allocating costs for quality improvement programs, as well as linking the expenditure process for quality improvement with increased revenues. (Roland T. Rust, 2017)

Customer Satisfaction Process:

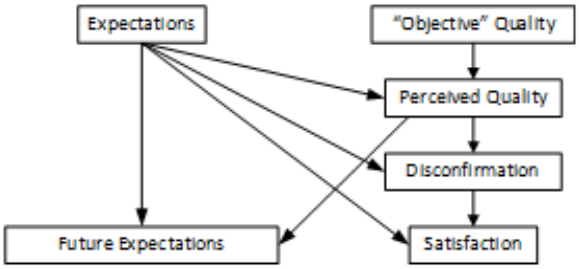

Figure 2. Customer Satisfaction Process

ROQ emphasizes customer satisfaction surveys as an effort to improve quality. The level of customer satisfaction from several dimensions of service will affect the level of satisfaction of the entire service process.

Equations and calculations in ROQ:

1. Calculation of customer retention

$R = (1\text{-}S)\ R_1 + SR_2 + D(R_3\text{-}R_2)$

R_1, R_2, R_3 = the average retention rate for each group of customers who are dissatisfied, satisfied, and impressed with the services provided

S = the percentage of customers who are satisfied with the overall service

D = percentage of customers who are impressed with the overall service

2. Determination of market share due to new retention rates

Customer Retained = $RM_{t-1}\ N_{t-1}$

Customer switching to us = $(1\text{-}R'\text{-}C)\ (1\text{-}M_{t-1})\ N_{t-1}$

New Customer = $A\ [N_t - (1\text{-}C)\ N_{t-1}]$

R = enterprise customer retention rate

R' = competitor's customer retention rate

M_t = market share in period t

N_t = market size in period t

C = churn

A = the percentage of customers who choose the company's services

3. Value of NPV and ROQ

$$NPV = \sum_{k=1}^{P} (1+I)^{-k}[YM_{t+k}(1+G)^{k}N_t - X_{t+k}]$$

t = reference year

k = iteration index

P = Analysis period

I = burden on capital

Y = average contribution margin

G = market growth rate

X_t = constant value of expenses over time

$$NPVAS = F' + (F - F_0)[(1 - (1+I)^{-P}/I)]$$

F' = costs incurred to start a quality improvement program

F = costs incurred to run a quality improvement program each year

F_0 = costs incurred to run old (current) programs

$ROQ = (NPV - NPV_0) / NPVAS$

NPV = *Net Present Value* when the program is done

NPV_0 = *Net Present Value* before the program

3. Methodology

1. Identification of variables and samples
   a. Determine the variables and samples that affect the quality of inpatient services
   b. Creation and distribution of questionnaires
2. Data collection and processing, which is supported by the following data:

a. Primary data: questionnaire data, observations and interviews obtained from patients in the inpatient section of Maternity Hospital X, which are used to determine customer satisfaction from the services provided by Maternity Hospital X.

b. Secondary data:

- Data on population, family planning participants, couples of childbearing age, women of childbearing age, pregnant women in Sidoarjo Regency obtained from the Regency Government, Health Office and BKKBN of Sidoarjo Regency
- Data from Maternity Hospital X, including: data on the capacity of inpatient rooms, the number of patients, especially pregnant women, and financial data in the form of costs incurred before the quality improvement program is carried out.

3. Planning of service quality improvement programs
   a. Choose an influential alternative
   b. Arrange the chosen alternative
4. Financial calculations
5. Analysis: assessing the feasibility and selecting a service quality improvement program.

4. Results and Discussion

a. Questionnaire results

From the results of the questionnaire distribution, the structure and hierarchy are obtained as follows:

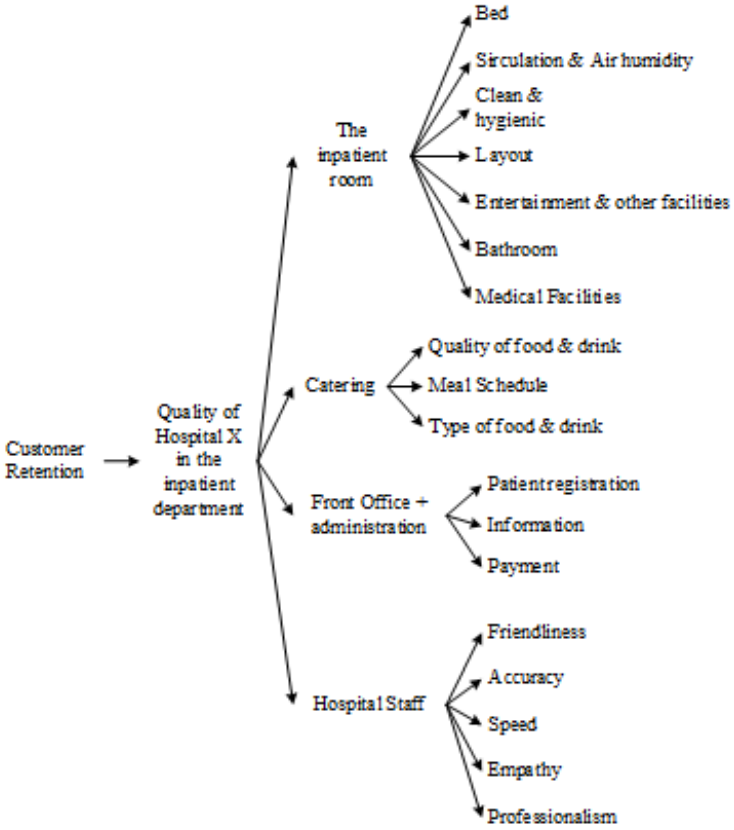

Figure 3. Questionnaire structure and hierarchy

b. Satisfaction and Delight Data Processing

Processing of satisfaction and delight data on overall hospital services was carried out with stat graphics from the four service processes involved: (1) inpatient rooms, (2) catering, (3) front office & administration, (4) hospital staff, the results obtained are as follows:

Table 1. Importance-performance satisfaction

	Importance	Performance (% satisfied)
Process 1	0,3118904	77
Process 2	0,2538006	75
Process 3	0,260072	85
Process 4	0,217465	88

Table 2. Importance-performance delight

	Importance	Performance (% delighted)
Process 1	0,894837	2
Process 2	0,411589	11
Process 3	0,526333	12
Process 4	0,308433	17

Following the ROQ method, the next step is to draw a map of the importance-performance position, making it easier to identify service processes that are important to improve quality, as shown in Figures 4 and 5 below:

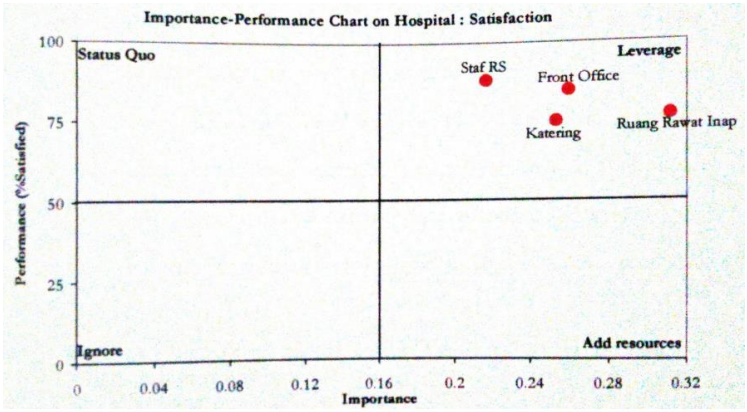

Figure 4. Hospital importance-performance satisfaction position map

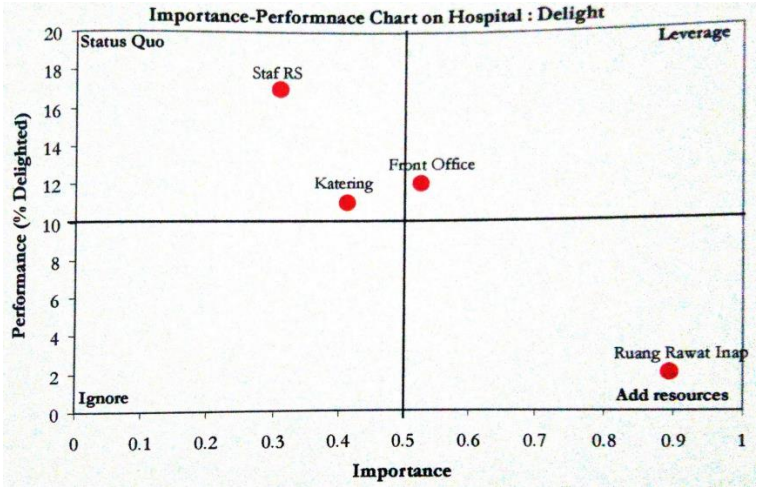

Figure 5. Hospital importance-performance delight position map

Based on the overall satisfaction and delight data processing, the dimensions that need attention to improve quality are obtained, they are:

1. Bed
2. Patient registration

The main priority for the quality improvement program is the inpatient room process with the dimensions of the bed and the front office & administration process with the patient registration dimension.

c. Service Quality Improvement of Maternity Hospital

From the complaint data obtained and submitted by patients on these two dimensions, improvements for the quality improvement program are proposed, they are:

1. Actions that can be taken by the management of the Maternity Hospital to improve bed comfort are to replace the bed mats in the 2nd and 3rd class inpatient rooms, they are from sponge material, while for class 1 it is replaced with a spring-bed, so the patient will feel comfortable at rest.
2. In the front office + administration process with patient registration dimensions, the Maternity Hospital management needs to add a registration counter equipped with several computer units that are tailored to the needs in order to register and reduce queues.

d. The Scores of Returns on Quality

With the ROQ method, the analysis of the RS retention rate calculation is as follows:

$R = (1\text{-}S)\ R_1 + SR_2 + D(R_3\text{-}R_2)$

$= [(1\text{-}0{,}4218)0{,}2571] + (0{,}4218x0{,}679) + [0{,}5261(0{,}7833\text{-}0{,}679)]$

$= 0{,}48993$

$= 48{,}99\%$

The calculation of the total retention rate of Hospital competitors is:

$M_{t+k} = [RxM_t + (1\text{-}R'\text{-}C)\ (1\text{-}M_t) + A(G\text{-}1+C) / G$

$0{,}1186 = [(0{,}4899x0{,}1124) + (1\text{-}R'\text{-}0{,}063)\ (1\text{-}0{,}1124) + 0{,}1157(1{,}0432\text{-}1+0{,}063)] / 1{,}0432$

$R' = 0{,}8793$

$= 87{,}93\%$

Calculation of Net Present Value

By using ROQ, the determination of the NPV of each program's cash flow without the quality improvement program is done by calculating the change in the quantity of income per period. The equation used is:

$$NPV = \sum_{k=1}^{P} (1+I)^{-k}[YM_{t+k}(1+G)^{k}N_t - X_{t+k}]$$

From these calculations, the results obtained are shown in table 3 and 4:

a. Before the improvement program

Table 3. NPV income before the improvement program

Dimension	Discount rate	Total NPV (Rp)
Inpatient room	5%	122164171.54
	10%	90487095.48
	15%	80214819.52
Front Office and administration	5%	103567154.88
	10%	90764721.58
	15%	80467026.91

b. Using the improvement program

Tabel 4. NPV income with the improvement program

Dimension	Discount rate	Total NPV (Rp)
Inpatient room	5%	140288994.99
	10%	100751580.4
	15%	84670391.46
Front Office and administration	5%	123712247.66
	10%	99344606.48
	15%	83536074.79

Calculation of Net Present Value for Additional Spending

The NPVAS value is the difference in expenditure that occurs after the program is implemented with no quality improvement. This value uses the following equation:

$$NPVAS = F' + (F - F_0)[(1 - (1 + I)^{-P}/I)]$$

From these calculations, the NPVAS results obtained are shown in Table 5:

Table 5. NPVAS results

Dimension	Discount rate	Total NPV (Rp)
Inpatient room	5%	11806699.35
	10%	10337665.06
	15%	9141494.56
Front Office and administration	5%	16170595.36
	10%	14158588.58
	15%	12520299.29

By using the formula ROQ = (NPV-NPV_0) / NPVAS, the ROQ results obtained are shown in:

Table 6. Value of Return on Quality (ROQ) for each alternative

Alternatives	*Discount Rate* (%)		
	5%	10%	15%
Inpatient	1,54	0,99	0,49
Front office and administration	1,25	0,61	0,24

From Table 6, it can be concluded that a feasible alternative to run (ROQ value > 1) is the inpatient room and front office + administration with a 5% discount rate. Consequently, the main focus of management in implementing quality improvement programs is on these two dimensions.

5. Conclusion

Based on the data results, the service process has two dimensions as the improvement concern: the bed in the inpatient room service process and the patient registration in the front office and administration service process. Financially, both programs are feasible because each shows a ROQ value. For programs in inpatient rooms, with discount rates of 5%, 10%, 15% (1.54; 0.99; 0.49), while for programs on patient registration, with discount rates of 5%, 10%, 15% (1.25; 0.61; 0.24). From these results, it can be concluded that the ROQ value of the inpatient program is higher than the patient registration program, so the main priority for quality improvement is the inpatient room program. By using the ROQ approach, the hospital management will be able to determine the level of customer satisfaction and which dimensions will be the focus of the quality improvement program and

determine the feasibility value of the quality improvement program carried out by looking at the ROQ value.

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