

# SATISFACTION ANALYSIS OF CUSTOMERS AND PROCESS IMPROVEMENT OF FORWARDING COMPANY USING RETURN ON QUALITY (ROQ) AND SERVICE QUALITY (SERVQUAL)

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## ABSTRACT

**Abstract.** Nowadays, the industry competency of forwarding service is getting tight. PT. X as one of forwarding company keeps increasing service quality to their customer. Satisfaction is reaching if what the consumer desire fulfilled by services. Analysis of customer satisfaction is measured by servqual method. The method is aimed to recognize the gap between customer expectation and customer satisfaction. As seen on servqual calculation, it can be arranged a program of quality upgrading which later will increase the customer satisfaction. The output cost to quality improvement program counted as an investment. The involved method to calculate the produced reservation for service improvement is return on quality. The method calculate level of customer retention as a result of an implemented quality improvement program. Improvement program which could be implemented is an increasing number of sales, giving incentive for the tally man, training the stripping and stuffing method periodically, survey of periodic customer desire and make claim officer division. ROQ calculation result showed that suggested program was appropriate to be implemented with ROQ value of 1,49 and insensitive with the interest rate.

**Key words :** *Service Quality, Forwarding, Return on Quality and customer retention*

## 1. INTRODUCTION

PT. X as service company which deliver inter islands demanded to keep increase the service quality to the customer. Customer satisfaction level is important to keep customer loyalty to the company, especially nowadays which many new competitors shown in the market area. The customer of the company is industry areas in Surabaya and surroundings whether it is a big industry or home industry which deliver their product through Tanjung Perak harbor in Surabaya.

Major problem that faced by the company is the different desire of each customers made company had to identified which attribute that influenced customer satisfaction. Servqual method used to identify customer desire and calculate value of customer perception and customer expectation .

Knowing customer expectation, company could identified certain steps to increase consumer satisfaction. A

quality service improvement program need certain costs, so it gave effect to operational expense. The increasing effect make company profit decreasing but the profit will be returned if design program of the company could increase consumer number and income.

One of the analysis was done to figure out effect of a quality improvement program to company profit was using the ROQ method (*Return on quality*). The method calculate retention value that will be received by company if the company program of quality improvement will be implemented, then we can figure out which planning programs appropriate to apply or which are not. Basic calculation of ROQ is the customer movement which was unsatisfied become satisfied customer, satisfied customer become an impressed customer of the improvement. The movement also hopes to increase the customer retention which directly increasing the market share of the company.

Problems that is going to be resolve in the research is how to know consumer desire of forwarding service and make improvement to company service process and analyzing financial to improvement of the service process.

The objective of the reasearch is to figure out properness of suggested service quality improvement. It was calculate ROQ value from quality improvement program.

The scope limitation of the study was: design horizon used is five years, the competitor of this market was the forwarding company with their commodity delivery was passing the Tanjung Perak Harbor Surabaya, whereas the gap calculation only considering the value of fifth gap, the assumption used was interest level as long as the horizon design still consistent and the voice of customer during horizon design could did not change.

## **2. RESEARCH METHODOLOGY**

The research was divided into three stages. The first stage is identify consumer desire bases on five primary dimension of servqual, then calculate the expectation and consumer perception and designed attribute which has high priority to satisfy customers. The data was primary data with spread services' questionnaire to customer.

Second stage is determined quality improvement program which will be implemented to company as the attribute priority in servqual. On this stage, also counted the estimation of output cost to realize the improvement program.

The last stage is analyzing the appropriateness of suggested improvement program. This stage calculated estimation of customer movement that was unsatisfied to be satisfied or which was satisfied to be impressed. Customer movement directly will increasing customer retention to the company. Increasing of customer retention will increased company's market share that will increasing the

company income. Appropriateness calculation of the research is calculating the NPV value when the program was not implemented yet using estimation value of marketing share increasing, and NPV value of program cost in a quality service improvement. Based on the NPV calculation, ROQ value was estimated. The improvement program is capable to be implemented if the ROQ value bigger than one in an certain level of interest.

## **3. RESEARCH RESULT DISCUSSION**

### **3.1 Attribute service quality of forwarding service and questionnaire hierarchy**

Based on the brainstorming and the observation of company business process could be identified as critical attributes that influenced company customer sastification in forwarding company. Table 1 summarized of five primary servqual dimensions.

In general the distribution of the questionnaire to company is divided into four parts : respondent identity, level of satisfication and desire to five quality dimension, important attribute level, satisfication level in general and level of consumer loyalty to the company.

Consumer perception and consumer desire evaluation to a quality of respondent service. Respondent gave their judgment to variables which influenced service quality by evaluating available statements in the questionnaires. The usage evaluation is a Likert scale 1-5. In the other hand, the evaluation of satisfaction level is measured by using three scales which are satisfied, impressed, and unsatisfied with their services.

Consumer loyalty evaluation is using customer percentage in using this service in the future. Scale used is 20%, 40%, 60% and 80 %. This scale used to make the calculation of customer retention easily. The important attribute level showed by question attribute of which is the most insist ones to be fixed.

**Table 1 Measure Variable of service quality**

No	Attribute
Tangible	1 Quality of available container & ship
	2 Cleanliness and Tidiness of company office
	3 Official employee performance
Reliability	4 Delivery accuracy / freight revenue as set schedule
	5 Document delivery speed
	6 Handling removal & delivery of container / freight
	7 The data accuracy & information given to <i>customer</i>
Responsiveness	8 Speed of official employee responses in answering <i>customer</i> question
	9 Speed of given service by sales / <i>Customer Service</i>
	10 Complaint/claim responses of the <i>customer</i>
Assurance	11 Safety (a guarantee of cargo's quality/ quantity preservation)
	12 Hospitality & good manners in answering the phone & <i>customer</i>
	13 Capability of work comprehension in answering <i>customer</i> questions
Empathy	14 Facilitating contact to company through telephone, fax and email
	15 Total sales Visits to <i>customer</i>
	16 Company capability to understand the <i>customer</i> needs

### 3.2 Servqual Calculation Result

Servqual calculation has been done by calculate gap between expectation mean and perception mean (gap 5). Calculating Weighted Servqual Value (WSV) is by multiply gap 5 value with attribute weight. Attribute weight reached by doing normalisation of questionnaire weight value.

$$WSV = (Expectation - Perception) \times Weight... (1)$$

This calculation results showed which attribute that has big priority to be fixed. The results of WSV calculation for each attribute as follows:

**Table 2 Results of WSV calculation**

No	Expectation	Satisfaction	Gap 5	Weight	WSV
1	4,0213	3,5532	0,4681	8,26%	0,0386
2	3,8298	3,4681	0,3617	4,77%	0,0173
3	3,9362	3,7872	0,1489	4,68%	0,0070
4	3,8936	3,5745	0,3191	8,35%	0,0266
5	3,8723	3,4894	0,3830	7,06%	0,0271
6	3,9362	3,6383	0,2979	7,80%	0,0232
7	3,9362	3,7660	0,1702	6,33%	0,0108
8	3,9787	3,6809	0,2979	5,60%	0,0167
9	4,0000	3,7660	0,2340	5,78%	0,0135
10	4,0000	3,2340	0,7660	6,61%	0,0506
11	3,9149	3,6809	0,2340	7,80%	0,0183
12	3,9787	3,9362	0,0426	5,69%	0,0024
13	3,8936	3,7447	0,1489	5,14%	0,0077
14	3,9362	3,6383	0,2979	5,23%	0,0156
15	3,6809	2,8723	0,8085	5,50%	0,0445
16	4,0851	3,4681	0,6170	5,41%	0,0334

As above WSV calculation, attribute priority that need to be fixed by company based on the biggest WSV as follows:

**Table 3 Attribute priority that need to be fixed.**

No	Attribute
1	Complaint/claim responses of the <i>customer</i>
2	Total sales Visits to <i>customer</i>
3	Quality of available container & ship
4	Company capability to understand the <i>customer</i> needs
5	Document delivery speed
6	Delivery accuracy / freight revenue as set schedule
7	Handling removal & delivery of container / freight
8	Safety (a guarantee of cargo's quality/ quantity preservation)
9	Cleanliness and Tidiness of company office
10	Speed of official employee responses in answering <i>customer</i> question
11	Facilitating contact to company through telephone, fax and email
12	Speed of given service by sales / <i>Customer Service</i>
13	The data accuracy & information given to <i>customer</i>
14	Capability of work comprehension in answering <i>customer</i> questions
15	Official employee performance
16	Hospitality & good manners in answering the phone & <i>customer</i>

### 3.3 Determining Quality Improvement Program.

As *servqual* calculation on Table 3, it had been decided to improve eight attributes that has the biggest value, but there is one attribute, attribute of container quality and available ship now can not be improve yet because company has long terms contract with trucking company and voyage which can not be decided if there is no emergency problems. In general the proposal of quality improvement program to fix the attribute as follows:

Table 4 The proposal of quality improvement program

Improvement Program	Early cost	Yearly cost
Increasing Sales	35.000.000	52.800.000
Incentive distribution to tally man		148.087.550
Stuffing and stripping trainee		30.000.000
Claim officer establishment	150.000.000	100.000.000
Survey of consumer desire		30000000
<b>Total</b>	<b>185.000.000</b>	<b>360.887.550</b>

Based on the fixed attribute, we can estimate customer removal value of improvement programs. Estimation of customer removal is done by normalised the WSV value. The calculation results are:

Table 5 Customer Removal Estimation

No	Attribute	A	B
1	Freight revenue as set shedule	7,54%	2,52%
2	Document delivery speed	7,98%	2,93%
3	Handling removal & delivery of container	6,46%	2,94%
4	Claim responses of the customer	8,45%	5,73%
5	Safety	6,46%	2,65%
6	Total sales visits to customer	9,12%	3,74%
7	Capability to understand the customer needs	6,93%	3,47%
<b>Total</b>		<b>52,94%</b>	<b>23,99%</b>

Which:

A : Customer movement from unsatisfied to satisfied.

B : Customer movement from satisfied to impressed.

### 3.4 The Calculation of ROQ.

#### 3.4.1 The Calculation of Market Share

Market share can be identified by calculating the new customers, customers who retained with the company, and customers who switch from other company to this company.

The formula is as follow:

Customer Retained

$$R M_{t-1} N_{t-1} \dots\dots\dots(2)$$

Customer switching to Us

$$(1-R'-C) (1- M_t) N_{t-1} \dots\dots\dots(3)$$

New Customer

$$A [N_t - (1-C) N_{t-1}] \dots\dots\dots(4)$$

Notes:

R = The speed of customer's retention of the company.

R' = The speed of costumer's retention of the company's competitor.

Mt = The Market segment in T period.

Nt = Market size in T period.

C = Churn

A = The attraction of the company by the customer's perception.

C value is customer who leaves the market segment which estimated as follow:

Table 6 The Estimation of churn value.

Year	Churn Data
0	0,77%
1	0,78%
2	0,80%
3	0,80%
4	0,79%
5	0,79%

However, the value of A can be identified from the comparison between new customers who moved in the market segment with the whole new customers.

$$A = 524 / 16319 = 3,21 \%$$

The calculation R' of can be done by adding the C value into 2 equation, as a result the value is 0,9613.

The calculation of the customer's retention using the equation as follow:

$$R = (1-S) R1 + SR2 + D (R3-R2).....(5)$$

Where R1, R2, R3 are the speed of the retention rate for each group of the customers who unsatisfied, satisfied, and impressed with the service given, S is the Percentage of the customers who satisfied with the overall service and D is the Percentage of customers who impressed with the overall service. The percentage of customers who unsatisfied, satisfied, and impressed with the service given is using the calculation of the customer's transfer in Table 3. The result of the calculation of customer's retention is as follow:

Table 7 The Estimate Calculation of Customer's retention

Yr	% of unsatisfied customers	% of satisfied customers	% of impressed customers	The Customer's Retention
1	27,66%	51,06%	21,28%	<b>51,91%</b>
2	13,02%	53,45%	33,53%	<b>58,26%</b>
3	6,13%	47,52%	46,35%	<b>62,53%</b>
4	2,88%	39,36%	57,75%	<b>65,51%</b>
5	1,36%	31,45%	67,20%	<b>67,66%</b>

However, the sum of *market size* at the moment is 268.079, with the market growth is appropriate the growth of goods value which leave out from Tanjung Perak port in the past 5 years, then the sum of *market size* for the next 5 years is as follow:

Yr	Customer Retained	Customer switching to Us	New Customer	Mt	Nt
1	-	-	-	5.83%	268.079
2	9.105	7.826	691	6,13%	287.502
3	11.019	8.339	705	6,53%	307.168
4	13.144	8.814	735	6,93%	327.593
5	15.353	9.360	789	7,30%	349.571

Table 8 The Estimate market size

Year	Growth	market size
1	5,13%	268.079
2	7,25%	287.502
3	6,84%	307.168
4	6,65%	327.593
5	6,71%	349.571

And the *market share* of the company for the past two years is as follow:

Table 9 The Company's Market share

Year	Market share	Market size
2004	15.105	251.760
2005	15.629	268.079

Based on the value of market share and *market size* above, therefore the estimate *market share* for the next five years can be calculated as follow:

Table 9 The Company's Estimate Market share

### 3.4.2 The Calculation of NPV and NPVAS

The calculation of this NPV is the calculation of NPV with the value of *market share* increased as the affect of the quality improvisation program. The equation used is as follow:

$$\sum_{k=1}^p (1 + I)^{-k} [YM_{t+k} N_{t+k} - X_{t+k}] .....(6)$$

Notes:

- t = The retention year
- k = Iteration Index
- P = Analysis Period
- I = The interest rate

Y = The profit margin average  
 Mt = The market segment in T period  
 Nt = Market size in T period  
 X<sub>t+k</sub> = The amount of constant cost each year

By using I = 12,5%, the 5 years analysis period and the profit margin average is Rp.300.000.00 each teus, the market segment is like in Table 9 and market size like in Table 8, so the calculation of the NPV is as follow:

Table 10 The Calculation of NPV

Year	Market Share	Market size	NPV
1	5,83%	268.079	4.167.734.853
2	6,13%	287.502	4.177.046.235
3	6,53%	307.168	4.227.290.893
4	6,93%	327.593	4.250.047.027
5	7,30%	349.571	4.245.585.997
NPV Total			21.067.705.006

In conclusion the total amount of the company's NPV after the implementation of the quality improvisation program is Rp. 21.067.705.006.00

The early calculation of NPV before the implementation of quality improvisation program is as follow:

Table 11 The NPV before improvement

Year	Market Share	Market size	NPV <sub>0</sub>
1	0,0583	268.079	4.167.734.853
2	0,0583	287.502	3.973.067.906
3	0,0583	307.168	3.773.181.687
4	0,0583	327.593	3.576.963.798
5	0,0583	349.571	3.392.831.786
<b>Total</b>			18.883.780.031

In conclusion the total amount of the company's NPV before the improvement of the quality program is Rp.18.883.780.031.

The value of NPV as affect of cost of the quality improvement program (NPVAS) is using the equation as follow:

$$NPVAS = F' + \sum_{k=1}^P (F - F_0)(1 + I)^{-k}$$

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

Notes:

F' = the cost spends to start the quality improvisation program.

F = the cost spends for the quality improvisation program each year.

F<sub>0</sub> = the cost spends to run the previous program.

By adding the cost of the improvisation program the result of the calculation of NPVAS is as follow:

Table 12 the Calculation of NPVAS

k	F	I	NPV
1	360887550	1,125	320.788.933,33
2	360887550	1,125	285.145.718,52
3	360887550	1,125	253.462.860,91
4	360887550	1,125	225.300.320,80
5	360887550	1,125	200.266.951,83
NPV			1.284.964.785,39
F			185.000.000,00
NPVAS			1.469.964.785,39

### 3.4.3 The Calculation of ROQ

The calculation of ROQ is used to determine the decent of the quality improvisation program suggested. The ROQ calculation is using the formula in equation 2.9

$$ROQ = (NPV - NPV_0) / NPVAS$$

$$= (21.067.705.006.00 - 18.883.780.031.00) / 1.469.964.785,39$$

$$= 2.183.924.975.00 / 1.469.964.785,39$$

$$= 1.49$$

Because of the value of ROQ > 1, therefore the suggested program is decent to be implemented and it will gives profit to the company.

### 3.5 The Sensitivity Analysis

The sensitivity analysis is used to identify how sensitive this quality improvement program to the changing of the decent parameter study which is the interest rate and time. The

calculation of sensitivity analysis is identified by finding the point where the value of ROQ from the running program is indecent or less than one.

### 3.5.1 Sensitivity towards Interest

Based on the graphic, the calculation of the sensitivity towards interest can be shown as follow:

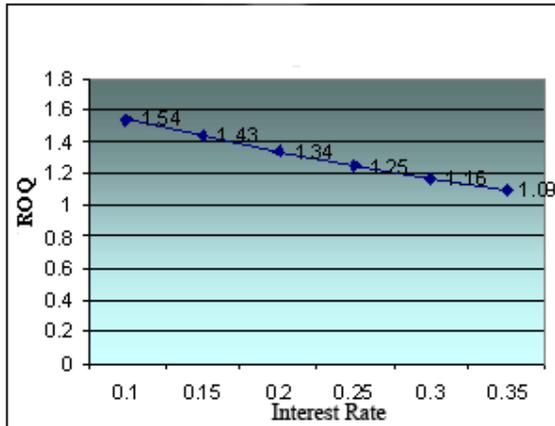


Figure 1 The Comparison of ROQ based on Interest.

The calculation is identified by showing that this program is decent to implement at interest rate 35%. This result shows that the suggested program is not sensitive to the changes of interest.

### 3.5.2 Sensitivity towards Time

The calculation of the sensitivity towards time analysis is used to know how much the minimum iteration from the improvisation program that is in progress. The result of the calculation is shown in the graphic as follow:

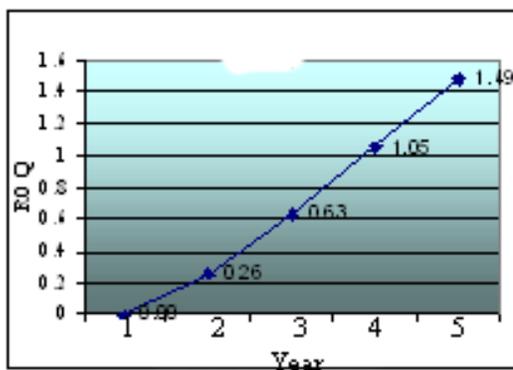


Figure 2 ROQ index for Several Years.

The result of the calculation shows that the improvement program is indecent to be implemented in less than 3 years period but become decent in the forth year. This fact shows that this program is sensitive towards time.

## 4. CONCLUSION AND SUGGESTIONS

Conclusions that can be taken from this research are as follow:

1. The attributes that needed an improvement based on the calculation of *servqual* in X company are as follow:

- Respond to complaint/claim from *customer*
- The total visits of Sales to *customer*
- The quality of containers and ships provided
- The company's capability in understanding the *customer's* needs
- The rapidity in sending document
- The stability in sending/receiving cargo on time
- The management in taking and handing container/cargo
- *Safety* (the guaranty of quality/quantity cargo)

2. The customer's retention who's unsatisfied with the service is 27.69%, on the other hand the customer who satisfied is 55.83% and customer who is impressed is 74%.

3. The quality improvement program that can be implemented on X company are such as:

- To add more sales
- To give incentive for *tally man*
- Training about *Stripping* and *stuffing* methods periodically
- To survey the customer's desire periodically
- To form *Claim Officer* division.

4. Customers who move from satisfied to impressed are from the affect of the quality improvement program that is estimated about 23.99% and customers who from unsatisfied to satisfy is about 52.94%.
5. The early cost that the company spent to implement the quality improvement program is Rp.185.000.000.00 and the annual cost is Rp.335.887.550.00
6. Based on the calculation of ROQ, the suggested program is decent to be implemented is with the value of  $ROQ = 1.49$
7. The suggested quality improvisation program is not *sensitive* with the changing of interest but sensitive to the changing of time.

Suggestion for the next research is that research should be done in sequence to know the dynamic of consumer's desire.

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