

QUALITY ANALYSIS OF GOODS DELIVERY SERVICE USING SIX SIGMA APPROACH IN PT. KAMADJAJA LOGISTICS SURABAYA

Achmad Ubaidillah¹, Indah Apriliana Sari²

^{1,2}Industrial Engineering, Faculty of Engineering

University of 45 Surabaya

Email : indahaprilianasari@gmail.com

Abstract

Complaints within the company are often found in service companies because of the complexity of the activities in the service company. Speed and accuracy are important for freight forwarding companies. The purpose of quality control is to reduce complaints (defects) and even achieve zero defects. The focus of this research is to analyze the service attributes that need to be developed by PT Kamadjaja Surabaya with the Six Sigma method. The results of this study indicate that the quality of service has not been maximized which is still far from the level of 6 sigma with DPMO 3.4 for that service needs to be improved. This is indicated from the results of measurements with the six sigma method showing an average performance score of 3.74; expectation score of 4.90; gap -1,16; satisfaction level is 76.37%, DPMO value is 251733, and sigma level is 2.25. It becomes the dominant attribute that causes customer dissatisfaction.

Keywords: Quality, Consumer satisfaction, Six Sigma, Kamadjaja Surabaya

I. INTRODUCTION

PT. SPIL (Salam Pasific Indonesia) is one of the largest shipping companies in Indonesia which used to only operate in the shipping sector, but currently has opened a subsidiary engaged in the EMKL (Sea Cargo Expedition) field. To maintain existence and be able to compete with new entrants, companies must improve the quality of service so that customers do not switch to other companies.

According to (Nugroho and Priarta, 2011), one way to win the competition is that companies must be able to provide satisfaction to their customers, for example by providing better quality products, cheaper prices, and better services than competitors.

The meaning of satisfaction itself, according to Kotler and Keller (2013) is someone's happy or disappointed feelings that arise after comparing the performance (or results) of the product thought to the expected performance (or results). If performance fails to meet expectations, resulting in consumers feeling dissatisfied, if performance is in line with expectations, then consumers will be satisfied, and if performance exceeds expectations, then consumers will feel very satisfied.

In the face of competition, companies must be able to provide quality products or services, both in terms of price and speed of service. Consumers who are satisfied with the services provided will have implications for the creation of customer loyalty, so they will not switch to competitor service products. However, if this is not fulfilled, their loyalty will be lost so that they will switch to buy competitors' products or services. Dissatisfaction will have implications for the decline in sales, thereby reducing profits or even losses for the company.

PT. Kamadjaja Surabaya, which has several business branches in the city of Surabaya, seems to still have shortcomings in terms of service. This is evidenced by complaints from consumers such as delays in picking up goods, delays in delivery of goods, time of moving goods from containers to the

recipient warehouse for a long time, due to lack of unloading labor, the number of items damaged in moving from container to warehouse, lack of employee attention, to the inability of employees to provide satisfying answers to customers.

Based on these problems, the researchers tried to find the main problems and the solution at Klog Surabaya which is one of the business branches of PT. Kamadjaja Logistics. The focus of this research is to analyze the service attributes that need to be developed by PT. Kamadjaja Surabaya with the Six Sigma method. Six Sigma was chosen because it is a quality improvement analysis method oriented to world class quality, namely with level 6 sigma or 3.4 DPMO (Defect per Million Opportunity). Here the author also cites scientific papers from Prasetyo (2018) who have helped PT TIKI JNE Bandar Lampung city, in finding what factors can improve the quality of their services.

The purpose of this study is to find out what factors most influence the decline in service quality, as well as screening the quality of the company as a whole.

II. LITERATURE REVIEW

This research will really be emphasized to discuss about quality because it is the key to winning competition in the market. If the company is able to provide quality products, indirectly they also have built a foundation of customer satisfaction values.

Sunyoto (2012) states that quality is a measure to assess that a product or service has a use value as desired or in other words a product or service is deemed to have quality if it functions or has a use value as desired.

1. Definition of Service

Service is an activity offered by service providers to consumers, can be

in the form of objects and other objects, this was written by Lovelock and Wirtz (2011: 37) which states, Services are economic activities offered by one party to another party. According to Sunyoto (2012) there are several definitions of services including those services as deeds (actions, procedures, activities); intangible processes and performance. Services are intangible (such as comfort, entertainment, speed, pleasure, and health) and perishable (services may not be stored as supplies that are ready to be sold or consumed when needed) services are created and consumed simultaneously.

2. Service of Characteristics

Kotler (2013) suggests that services have four main characteristics, namely:

- a. *Intangibility* : is an act, action, experience, process, performance (performance) or business that is abstract, cannot be seen, felt, smelled, heard or touched before being bought and consumed.
- b. *Inseparability* : Goods are usually produced first, then sold, then consumed. While services are generally sold first, then produced and consumed at the same time and place.
- c. *Variability* : Service varies greatly. Quality depends on who provides them and when and where quality of service is provided. Temporary demand makes it difficult to deliver consistent products.
- d. *Perishability* : service or service is a commodity that is not durable, cannot be stored for future reuse, resale or return.

3. Customers Satisfaction

The definition of customer satisfaction according to Brierley & MaDougall cited by Tjiptono (2011) is a measure of an organization's "total product" performance compared to a series of customer requirements. The basic principle underlying the importance of measuring customer

satisfaction is "doing best what matters most to customers" (doing the best aspects, most important for customers "Kotler, Et, Al - quoted by Tjiptono (2011), four methods for measuring customer satisfaction :

- a. Complaints and suggestions system
 - b. Hire several ghost shopper who act as potential customers
 - c. Lost customer analysis, contacting consumers who have stopped buying to make it an evaluation.
 - d. Consumer satisfaction survey
4. Service Quality Methode

According to Fitzsimmons (2014: 166) argues that "Service quality can be known by comparing the perception of customers for services that are actually expected". Meanwhile, if the reality is less than expected, the service can be said to be of less quality, and if the reality is the same as expected, the service is satisfactory. Servqual consists of two parts, namely the Expectation and Perception Section. The expectations section expresses expectations within the buyer and that is what the standard guarantees to assess the quality of the company's services. while the Perception section, states the assessment of the services it receives.

Expectations and perceptions are measured by a scale consisting of 5 degrees of importance. Where the value of 1 states "strongly disagree" and number 5 states very much agree.

5. Six Sigma

Six Sigma is an organizational approach to eliminate irregularities and reduce waste in the process by using a statistical science approach. Six Sigma is defined as a business improvement strategy to eliminate waste, reduce costs due to poor quality, and improve the effectiveness of all operations, so as to meet the needs and needs of consumers (Anthony and Banuelas in Syukron and Kholil, 2013).

The goal of Six Sigma is to reduce the number of customer experiences to three in a million (for the

six sigma level). The six-sig methodology is used to obtain factual information about customer satisfaction (Dewi and Widiyanto, 2015). Whereas the measurement steps of the service quality improvement process are as follows:

- a. Definition Phase: defines process improvement and keeps the focus on customers and the company's strategy.
- b. Measurement phase: aims to measure current performance so that it can be compared with targets that have been set.

- Measurement of expectations

-

$$E_{ij} = \frac{\sum_{i=1}^n T E}{N}$$

E_{ij} = expectation score on dimension j

TE_{ij} = customer expectation score of attribute i

N_j = number of respondents

- Performance Measurement

$$E_{ij} = \frac{\sum_{i=1}^n T E}{N}$$

E_{ij} = expectation score on dimension j

TE_{ij} = customer expectation score of attribute i

N_j = number of respondents

- Gap

$$\text{Gap} = P_{ij} - E_{ij}$$

- Satisfaction Level

satisfaction level

$$= \frac{P_{ij}}{E} \times 100\%$$

- Measurement of DPMO (Defect per Million Opportunity):

$$= \left(1 - \frac{\frac{D}{T}}{\frac{P}{K}} \right) \times 100000$$

- sigma level :

$$S = \left(1 - \frac{\frac{D}{L}}{100000} \right) + 1,5$$

- Analyze Phase : try to understand why the deviation occurs and look for reasons that cause the deviation or error
 - Improve Phase : make a design solution (action plan) in improving, and improving the quality of sigma in processes that require improvement
 - Control Phase : maintain the design of improvements that have been made so that it does not return to the original condition before the repair.
6. Previous Research

In 2018, Nokta made scientific works with the theme of improving the quality of services. He identified factors that influence the quality of services, among others: lack of employees in communication with customers, the layout of service rooms is less comfortable, lack of employee speed in responding to complaints from customers, the number of employees lacking to respond to customers, work tools still need renewal, and company SOPs need renewal in a better direction. Whereas in 2018, Prasetyo, who analyzed the quality of the shipping service with six sigma, identified factors that influenced, among other things: timeliness of delivery of goods, the condition of goods received in good condition according to the order, timeliness of service in accordance with the time given, JNE guarantees the security of transactions and the delivery of goods to customers, JNE is willing to accept criticisms and suggestions, Information on goods arrives (Prasetyo, 2018), convenient operating time and facilitate customers, speed of delivery of goods.

III. Research Methodology

The steps of the research to be carried out are as follows:

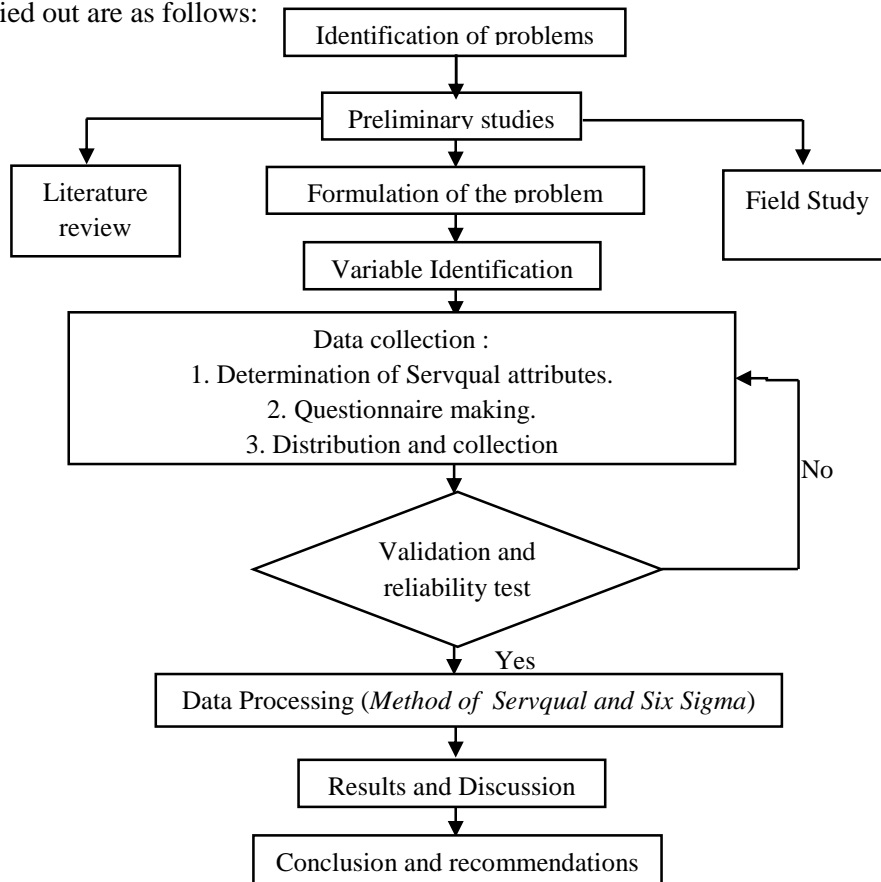


Figure 1. Flow chart of this research

Variable measurements are performed using 5 Likert scales, for expectation and perception categories. And the following is a Likert scale that is used to measure the variables

Table 1. Likert scale expectation category

Answer Choice	Score
Very unimportant	1
Not important	2
Quite important	3
Urgent	4
Very important	5

Table 2. Likert scale for performance or perception categories

Answer Choice	Score
Very Dissatisfied	1
Not satisfied	2
Quite satisfied	3
Satisfied	4
Very satisfied	5

The reason the Likert scale is used is because the Likert scale has some

merit compared to other types, namely besides being relatively easy it is also

reflected in the diversity of scores (variability of score) as a user of a scale of 1 to 10. In general the Likert scale is used to measure the attitude or response of someone expected to an object . This is because in addition to being practical,

a well-designed Likert scale generally has satisfactory reliability.

The following are indicators of the research variables used as questionnaire questions.

Table 3. Indicator of the research variable used

Variabel	Dimension Variable	Definition	Indicator of Service	Variable
Service Quality (X)	<i>Tangible</i> (D1)	Physical facilities, equipment and personnel appearance (van Iwarden et al., 2003 in Dehghan (2012: 5)	Comfortable office and supporting facilities	V ₁
			Neat looking employees	V ₂
			Modern equipment	V ₃
	<i>Reliability</i> (D2)	The ability to perform promised services directly and accurately (van Iwarden et al, 2003 in Dehghan (2012: 5)	The ability of employees to deal with problems faced by customers	V ₄
			Delivery the goods on time	V ₅
			The condition of goods received by customers is good and appropriate	V ₆
	<i>Responsiveness</i> (D3)	Willingness to help customers and provide fast service (van Iwarden et al, 2003 in Dehghan (2012: 5)	Pick up goods on time	V ₇
			Goods information arrived	V ₈
			Fast service process	V ₉
	<i>Assurance</i> (D4)	Knowledge and respect from employees and their ability to inspire trust and confidence (including competence, courtesy, credibility, and security) (van Iwarden et al, 2003 in Dehghan (2012: 5)	Employees are ready to respond to customer requests	V ₁₀
			Transaction security guarantee	V ₁₁
			Employees are always polite and friendly	V ₁₂
	<i>Empathy</i> (D5)	Individual attention given by the company to its customers (including access, communication, customer understanding) (van Iwarden et al, 2003 in Dehghan (2012: 5)	Employees are able to answer customer questions	V ₁₃
			Willing to accept criticism and suggestions	V ₁₄
			Operating time is convenient and makes it easy for customers	V ₁₅

Population and research sample

1. Population

The population used in this study is the number of corporate service

users from January 2018 to August 2019.

Table 4. Number of shipping containers

No	Month	Shipment Amount	
		2018	2019
1	January	1503	1048
2	February	1546	1264
3	March	1604	1191
4	April	1571	954
5	Mei	1511	779

6	June	1075	498
7	July	1206	564
8	Augustus	1321	679
9	September	1451	
10	October	1362	
11	Nopember	1320	
12	December	1344	
Mean		1189	

2. Sample

Determination of the sample size in this study was taken using the Slovin formula (Sugiono 2013) :

$$n = \frac{N}{1 + Ne^2}$$

Information :

n = sample size

N = population mount

e = fault tolerance limit

Based on the formula above, the following calculation is obtained :

$$n = \frac{1189}{1 + 1189 (0.1)^2} = 92.24 \quad 100$$

Sampling is done randomly without regard to strata of the population presented. Members of PT. Kamadjaja Logistik surrounds the same opportunities because it has (had experiece) interacting directly with service providers.

Research result

Tabel 5. Validity Results of SPSS Data Processing for Tangibles Expectation Dimensions

	X1	X2	X3	Total
X1	Pearson Correlation	1	-.008	100
	Sig. (2-tailed)		.818	.000
	Sum of Squares and Cross-products	10.410	-.010	-.040
	Covariance	.030	-.001	-.003
	N	100	100	100
X2	Pearson Correlation	.026	1	.532**
	Sig. (2-tailed)	.949		.000
	Sum of Squares and Cross-products	.020	11.210	.430
	Covariance	-.001	.114	-.002
	N	100	100	100
X3	Pearson Correlation	-.011	-.041	1
	Sig. (2-tailed)	.791	.008	.000
	Sum of Squares and Cross-products	1.210	-.410	8.290
	Covariance	.013	-.004	.099
	N	100	100	100
Total	Pearson Correlation	.664**	.535**	.565**
	Sig. (2-tailed)	.000	.000	.000
	Sum of Squares and Cross-products	14.600	10.800	10.600
	Covariance	.147	.108	.107
	N	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Validity test is performed on the results of the questionnaire to calculate the correlation coefficient between the scores of each attribute for each respondent and the total answers of each respondent. And the results of the validity test of all dimensions using the SPSS 20.0 application found that all the questions are valid so that further data processing can be done.

From the calculations obtained the correlation value between the question score with the total score. This value is then compared with the value of r-table at 0.05 significance and the amount of data is 100 questionnaires, then the r-table is 0.195. if R arithmetic > r table then the question item is declared valid, whereas if R arithmetic < r table then the question item is declared invalid, here are the results of the calculation of the validity test per data dimension using SPSS 20.0.

Expectations

a. Tangible

Table 6. Summary of Tangible Expectation Validity Test

Question	r count	r table	Information
X1	0,664	0,195	Valid
X2	0,535		Valid
X3	0,565		Valid

b. Reliability

Table 7. Validity Test Results if the SPSS data is the Reliability Expectation dimension

		X1	X5	X6	X7	Total
X4	Pearson Correlation	1	.730	.119	.022	.512**
	Sig. (2-tailed)		.87	.338	.630	.000
	Sum of Squares and Cross-products	8.000	1.600	1.200	.200	7.800
	Covariance	.041	-.015	-.019	.002	0,09
X5	Pearson Correlation		1	.100	.097	.404**
	Sig. (2-tailed)			.303	.087	.000
	Sum of Squares and Cross-products	-1.000	12.750	-8.500	-8.500	7.250
	Covariance	-.019	.449	.010	.002	0,73
X6	Pearson Correlation			1	-.004	.321**
	Sig. (2-tailed)				.922	.000
	Sum of Squares and Cross-products	-1.300	-.950	12.210	-0.10	4.010
	Covariance	0,4	0,10	1,44	.000	0,40
X7	Pearson Correlation				1	.222**
	Sig. (2-tailed)					.027
	Sum of Squares and Cross-products	.200	.200	.040	5.200	3.440
	Covariance	.002	-.002	.000	.082	0,73
Total	Pearson Correlation					1
	Sig. (2-tailed)					
	Sum of Squares and Cross-products	7.800	7.200	4.840	4.140	10.700
	Covariance	.079	.073	.049	.035	.250

** Correlation is significant at the 0.01 level (2-tailed)
 * Correlation is significant at the 0.05 level (2-tailed)

Table 8. Summary of validity reliability test

Question	r count	r table	Information
X4	0,512	0,195	Valid
X5	0,369		Valid
X6	0,261		Valid
X7	0,222		Valid

c. Responsiveness

Table 9. Validation Test Results Responsiveness dimension

		X8	X9	X10	Total
X8	Pearson Correlation	1	.099	.099	.539
	Sig. (2-tailed)		.327	.320	.000
	Sum of Squares and Cross-products	8.100	.920	.810	8.300
	Covariance	.009	.009	.009	.004
X9	Pearson Correlation		1	.099	.709**
	Sig. (2-tailed)			.327	.000
	Sum of Squares and Cross-products	820	10.580	820	12.400
	Covariance	.009	.107	.009	.125
X10	Pearson Correlation			1	.539**
	Sig. (2-tailed)				.000
	Sum of Squares and Cross-products	.810	.920	8.150	8.300
	Covariance	-.001	.009	.001	.011
Total	Pearson Correlation				1
	Sig. (2-tailed)				
	Sum of Squares and Cross-products	8.300	12.400	8.300	29.000
	Covariance	.084	.125	.084	.293

** Correlation is significant at the 0.01 level (2-tailed)

Table 10. Summary of the validity of the responsiveness of expectations

Question	r count	r table	Information
X8	0,593		Valid
X9	0,709	0,195	Valid
X10	0,539		Valid

d. Assurance

Table 11. Validity Test Results for SPSS data if the Assurance Expectation dimension

Correlations

		X11	X12	X13	Total
X11	Pearson Correlation	1			
	Sig. (2-tailed)				
	Sum of Squares and Cross-products				
	Covariance				
	N				
X12	Pearson Correlation	.538**	1		
	Sig. (2-tailed)	.000			
	Sum of Squares and Cross-products				
	Covariance				
	N				
X13	Pearson Correlation	.195	.566**	1	
	Sig. (2-tailed)	.066	.000		
	Sum of Squares and Cross-products				
	Covariance				
	N				
Total	Pearson Correlation	.530**	.616**	.566**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	6.390	8.160	7.160	21.710
	Covariance	.065	.082	.072	.219
	N	100	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

e. Empathy

Table 13. Empathy dimension validity test results

Correlations

		X14	X15	Total
X14	Pearson Correlation	1		
	Sig. (2-tailed)			
	Sum of Squares and Cross-products			
	Covariance			
	N			
X15	Pearson Correlation	.608**	1	
	Sig. (2-tailed)	.000		
	Sum of Squares and Cross-products			
	Covariance			
	N			
Total	Pearson Correlation	.608**	.738**	1
	Sig. (2-tailed)	.000	.000	
	Sum of Squares and Cross-products	11.280	16.110	27.390
	Covariance	.114	.163	.277
	N	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Table 14. Empathy dimension validity test results

Question	r count	r table	Information
X14	0,608		Valid
X15	0,738	0,195	Valid

Performance or Perception

a. Tangible

Table 15. Tangible Dimension Validity Test Results

		Y1	Y2	Y3	Total
Y1	Pearson Correlation	1	.070	.043	.642**
	Sig. (2-tailed)		.488	.673	.000
	Sum of Squares and Cross-products	47.440	2.200	-1.720	47.920
	Covariance	.479	.022	.017	.484
Y2	Pearson Correlation		1	.269**	.609**
	Sig. (2-tailed)			.007	.000
	Sum of Squares and Cross-products	2.200	20.750	7.150	30.100
	Covariance	.022	.210	.072	.304
Y3	Pearson Correlation			1	.624**
	Sig. (2-tailed)				.000
	Sum of Squares and Cross-products	-1.720	7.150	31.110	39.540
	Covariance	.017	.072	.345	.399
Total	Pearson Correlation	.612**	.609**	.624**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	47.920	30.100	39.540	117.560
	Covariance	.404	.304	.399	1.107
N		100	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Table 16. Summary of the validity test of tangible perception

Question	r count	r table	Information
Y1	0,642	0,195	Valid
Y2	0,609		Valid
Y3	0,624		Valid

b. Reliability

Table 17. Validity Test Results if SPSS data on the Perception Reliability dimension.

		Y4	Y5	Y6	Y7	Total
Y4	Pearson Correlation	1	.048	.017	.107	.239
	Sig. (2-tailed)		.625	.061	.062	.000
	Sum of Squares and Cross-products	30.980	1.070	1.010	10.720	54.080
	Covariance	.364	.037	.010	.100	.548
Y5	Pearson Correlation		1	.151	.024	.661**
	Sig. (2-tailed)			.117	.741	.000
	Sum of Squares and Cross-products	1.070	119.310	16.610	3.360	142.670
	Covariance	.034	1.205	.168	.034	1.441
Y6	Pearson Correlation			1	-.017	.540**
	Sig. (2-tailed)				.300	.000
	Sum of Squares and Cross-products	1.010	18.630	82.980	-7.720	102.910
	Covariance	.010	.168	.930	.078	1.039
Y7	Pearson Correlation				1	.500**
	Sig. (2-tailed)					.000
	Sum of Squares and Cross-products	10.720	1.060	-7.720	02.760	50.520
	Covariance	.108	.034	.078	.800	.914
Total	Pearson Correlation	.439**	.661**	.540**	.500**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	Sum of Squares and Cross-products	57.080	142.670	102.910	80.520	289.180
	Covariance	.546	1.441	1.039	.914	3.941
N		100	100	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Table 18. Summary of the validity test of perception reliability

Question	r count	r table	Information
Y4	0,493		Valid
Y5	0,661	0,195	Valid
Y6	0,540		Valid
Y7	0,500		Valid

c. Responsiveness

Table 19. Test Result of Perceived Responsiveness dimension Validity

		Correlations			
		Y8	Y9	Y10	Total
Y8	Pearson Correlation	1	.233	-.163	.612**
	Sig. (2-tailed)		.020	.106	.000
	Sum of Squares and Cross-products	36,000	10,000	-5,000	41,000
	Covariance	.064	.101	-.051	.414
	N	100	100	100	100
Y9	Pearson Correlation	.233	1	.018	.774**
	Sig. (2-tailed)	.020		.059	.000
	Sum of Squares and Cross-products	10,000	51,240	.660	61,900
	Covariance	.101	.510	.007	.625
	N	100	100	100	100
Y10	Pearson Correlation	.163	.018	1	.382**
	Sig. (2-tailed)	.106	.059		.000
	Sum of Squares and Cross-products	-5,000	.660	26,190	21,850
	Covariance	-.051	.007	.265	.221
	N	100	100	100	100
Total	Pearson Correlation	.612**	.774**	.382**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	41,000	61,900	21,850	124,750
	Covariance	.414	.625	.221	1,260
	N	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Table 20. Summarize the validity of perception responsiveness of perception

Question	r count	r table	Information
Y8	0,612		Valid
Y9	0,774	0,195	Valid
Y10	0,382		Valid

d. Assurance

Table 21. Test Results of Perceived Assurance dimension validity

		Correlations			
		Y11	Y12	Y13	Total
Y11	Pearson Correlation	1	.090	.090	.641**
	Sig. (2-tailed)		.375	.372	.000
	Sum of Squares and Cross-products	29.840	2.520	2.280	30.640
	Covariance	.261	.025	.023	.309
	N	100	100	100	100
Y12	Pearson Correlation	.090	1	-.042	.614**
	Sig. (2-tailed)	.375		.677	.000
	Sum of Squares and Cross-products	2.520	30.560	-1.160	31.920
	Covariance	.025	.309	.012	.322
	N	100	100	100	100
Y13	Pearson Correlation	.090	.042	1	.553**
	Sig. (2-tailed)	.372	.677		.000
	Sum of Squares and Cross-products	2.280	1.160	24.760	28.880
	Covariance	.023	-.012	.260	.261
	N	100	100	100	100
Total	Pearson Correlation	.641**	.614**	.553**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	30.640	31.920	25.000	90.410
	Covariance	.309	.322	.261	.893
	N	100	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Table 21. Summary of perception assurance validity tests

Question	r count	r table	Information
Y11	0,641	0,195	Valid
Y12	0,614		Valid
Y13	0,553		Valid

e. Empathy

Table 22. Validity Test Results if SPSS data Empathy Perception dimensions

		Correlations		
		Y14	Y15	Total
Y14	Pearson Correlation	1	.350**	.794**
	Sig. (2-tailed)		.000	.000
	Sum of Squares and Cross-products	23.790	9.790	33.580
	Covariance	.240	.099	.339
	N	100	100	100
Y15	Pearson Correlation	.350**	1	.851**
	Sig. (2-tailed)	.000		.000
	Sum of Squares and Cross-products	9.790	31.790	41.580
	Covariance	.099	.321	.420
	N	100	100	100
Total	Pearson Correlation	.794**	.851**	1
	Sig. (2-tailed)	.000	.000	
	Sum of Squares and Cross-products	33.580	41.580	75.160
	Covariance	.339	.420	.759
	N	100	100	100

** Correlation is significant at the 0.01 level (2-tailed).

Table 23. Summary of the validity of empathy perception test

Question	r Count	r table	Information
Y14	0,794	0,195	Valid
Y15	0,851		Valid

IV. Analysis of Service Quality on Customer Satisfaction Service quality method

In the table below, it can be seen that the gap is less than zero (<0), thus indicating a gap between the expectations and perceptions of

consumers. Consumers are still not satisfied with the services provided by PT. Kamadjaja Surabaya. This dissatisfaction is caused by consumers' perceptions when enjoying services not as expected.

Table 24. Value of the gap between the dimensions of perception and the dimensions of hope

No	Atribut	Percep tion Rate (X)	Expect ation level (Y)	Averag e Percep tion	Aver age Expe ctatio ns	Gap
1	Comfortable office and supporting facilities	384	484	3,84	4,84	-1
2	Neat looking employees	395	487	3,95	4,87	-0,92
3	Modern equipment	383	489	3,83	4,89	-1,06
4	The ability of employees to deal with problems faced by customers	351	490	3,51	4,9	-1,39
5	Delivery the goods on time	313	483	3,13	4,83	-1,7
6	The condition of goods received by customers is good and appropriate	349	485	3,49	4,85	-1,36
7	Pick up goods on time	330	490	3,3	4,9	-1,6
8	Goods information arrived	400	491	4	4,91	-0,91
9	Fast service process	374	488	3,74	4,88	-1,14
10	Employees are ready to respond to customer requests	391	491	3,91	4,91	-1
11	Transaction security guarantee	396	493	3,96	4,93	-0,97
12	Employees are always polite and friendly	388	492	3,88	4,92	-1,04
13	Employees are able to answer customer questions	382	488	3,82	4,88	-1,06
14	Willing to accept criticism and suggestions	389	486	3,89	4,86	-0,97
15	Operating time is convenient and makes it easy for customers	389	479	3,89	4,79	-0,9

V. Six Sigma

The Six Sigma method is used to determine the quality of service provided to customers, by using Define, Measure, Analyze, Improvement,

Control (DMAIC) to make Continuous improvements (Wisnubroto, 2012). The results of the six sigma calculation are shown in the table below.

Table 25. Six Sigma Calculation Results

Atribut	Average level of expect.	Average level of perfor.	Gap	Satisfaction Target	Level of Satisfaction	DPMO	Sigma value
V1	4.84	3.84	-1	100.00%	79.34%	232000	2.27
V2	4.87	3.95	-0.92	100.00%	81.11%	210000	2.29
V3	4.89	3.83	-1.06	100.00%	78.32%	234000	2.27
V4	4.9	3.51	-1.39	100.00%	71.63%	298000	2.20
V5	4.89	3.13	-1.76	100.00%	64.01%	374000	2.13
V6	4.93	3.49	-1.44	100.00%	70.79%	302000	2.20
V7	4.96	3.28	-1.68	100.00%	66.13%	344000	2.16
V8	4.91	4	-0.91	100.00%	81.47%	200000	2.30
V9	4.88	3.74	-1.14	100.00%	76.64%	252000	2.25
V10	4.9	3.91	-1.02	100.00%	79.80%	218000	2.28
V11	4.93	3.96	-0.97	100.00%	80.32%	208000	2.29
V12	4.92	3.88	-1.04	100.00%	78.86%	224000	2.28
V13	4.92	3.82	-1.1	100.00%	77.64%	236000	2.26
V14	4.92	3.89	-1.03	100.00%	79.07%	222000	2.28
V15	4.84	3.89	-0.95	100.00%	80.37%	222000	2.28
Sum.	4.90	3.74	-1.16	100.00%	76.37%	251733	2.25

VI. Conclusion

From the results of research and data processing, it was found that the most influential attribute on service quality and the priority of improvement was atribut Punctuality of delivery of goods. Whereas the most influential dimension is reliability. However, when

viewed from the side of consumer satisfaction, the quality of service is not optimal as indicated by the average performance score of 3.74; expectation score of 4.90; gap -1,16; satisfaction level of 76.37%, DPMO value 251733, and sigma level 2.25.

Bibliography

- Dehghan, Ali, Arash Shahin, dan Bahman Zenouzi., 2012., *Service Quality Gaps & Six Sigma*. Vol. 4 No.1. pp. 1-11
- Dewi, Anindita Kusuma dan Widiyanto, Ibnu., 2015, Sistem Informasi Kinerja Layanan Laboratorium Medis Dengan Metode Six Sigma. *Jurnal Sistem Informasi Bisnis* 02 (2015). pp. 161-170
- Fitzsimmons., 2014, Pengaruh Kualitas Pelayanan Terhadap Kepuasan Nasabah. *Bandung : Jurnal Ilmiah Kursor* Vol.2 No.5 Juli 2014 : 120-125.
- Kotler, Phillip, 2013, *Marketing Management* 11th ed. Upper Saddle River. NJ: Prentice Hall.
- Lovelock, C, dan Wirtz, 2011, "Pemasaran Jasa Perspektif edisi 7". Jakarta : Erlangga.
- Nokta, Angga Fadia, 2018, Peningkatan Kualitas Pelayanan Jasa Pada Departemen Umum dan Logistik
- Melalui Pendekatan Integrasi Metode Servqual Six Sigma PT. Slena Cahaya Gemilang Surabaya, *Matrik* Vol. 18 No. 2., Universitas Muhammadiyah Gresik.
- Sunyoto, Danang, 2012, *Dasar-dasar manajemen pemasaran*. Cetakan Pertama, Yogyakarta : CAPS.
- Syukron, Amin., Kholil, Muhammad, 2013, *Six Sigma Quality For Business Improvement*. Graha Ilmu. Jakarta
- Prasetyo, Galih, 2018, Analisis Kualitas Layanan Pengiriman Barang Menggunakan Pnedekatan Six Sigma di PT. TIKI JNE Kota Bandar Lampung. *Fakultas Ekonomi dan Bisnis, Universitas Bandar Lampung*.
- Tjiptono, Fandy dan Gregorius Chandra, 2011, *Service, Quality and Satisfaction Edisi Ketiga*. Andi. Yogyakarta.
- Wisnubroto, 2012, *Prosiding Seminar Nasional Aplikasi Sains & Teknologi (SNAST) Periode III* ISSN: 1979-911X. Yogyakarta.