

## Analysis of Service Quality Improvement Using the Six Sigma Method in the Hotel Four Seasons Resort at Jimbaran Bay

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**Abstract:** The purpose of this research is to determine the level of service quality applied at the Four Seasons Resort Hotel at Jimbaran Bay with the Six Sigma method. This research applies Six Sigma as a method to improve the quality of services of the Four Seasons Resort Hotel at Jimbaran Bay, specifically to meet customer expectations so that customers feel satisfied with the services provided. The results showed that the Four Seasons Resort Hotel at Jimbaran Bay had a DPMO value of 201.944, if converted it showed a Six Sigma value of 2,34 on a satisfaction target of 5 or very satisfied. Based on the Fishbone diagram, the order of problems that dominates must be resolved is the evaluation of services and facilities, standardization of time or improvement of administrative procedures, and allocation of vacant room items.

**Keywords:** *Six Sigma, Quality Improvement, Service Quality, DMAIC, DPMO*

### 1. Introduction

In generally, the company's goal is to produce goods or services in order to make a profit. The company wanting a continuous and developing production process that can guarantee the survival of the company [1]. The number of hotels, especially 5 star hotels in Bali Province, continues to increase every year. A significant increase where in 2015 there were 281 hotels which developed into 551 hotels in 2017 to date. The rapidly growth of similar hotels within 2 years is the reason for the management to maximize the performance of hotel excellence. Service quality greatly affects customer satisfaction, because if the service quality is not in accordance with consumer expectations [2]. The level of satisfaction is a function of the difference between perceived performance and expected performance [3]. Companies in Indonesia are also required to apply competent international standards. Therefore, hotel accommodation service companies must immediately improve themselves to be able to compete, especially in terms of service quality to their customers, one of which can be by applying the Six Sigma method. Six Sigma is a quality improvement tool based on data and statistical users and a management tool that focuses on quality control by exploring the company's overall production system to eliminate production defects, reduce product manufacturing time, and eliminate costs [4]. DMAIC is a process performance improvement cycle that is carried out on the collected data. Four Seasons Resort at Jimbaran Bay has not implemented Six Sigma as a performance measurement tool. This reseach applies Six Sigma as a method to improve the service quality of the Four Season Hotel at Jimbaran Bay, especially to meet customer expectations so that customers are satisfied with the services provided.

## 2. Literature review

### 2.1 Service Quality

Service Quality can be defined as the difference between the reality and the expectations of customers for the services they receive or receive. The concept of servqual is a choice of scale that is concise but has a high enough level of trust and truth where a company management can use it to better understand how customers' perceptions and expectations of a company's service quality[5].

### 2.2 Six Sigma

Six Sigma is a vision of improving the quality of products and services towards 3.4 failure rates per million opportunities [6]. This method uses a five-step methodology to remove defects at all stages of the company. Six Sigma defines defects as anything that is not in accordance with customer expectations. The purpose is to apply a measurement-based approach that focuses on identifying and increasing defects where customers can be said to be satisfied if they receive the service as expected. Quality management is based on three basic principles, namely focus on customers, participation and cooperation of all individuals in the company and focus on processes that are supported by continuous improvement and learning. These principles are the cornerstone of the Six Sigma philosophy [7].

## 3. Research methods

The author uses a quantitative descriptive analysis technique with a sample size of 80 customers. The instrument used in this study was a questionnaire from the measured service quality variables consisting of five dimensions. Each of the five dimensions of service quality is represented by several questions, totaling 18 questions. To determine the score, a Likert scale is used where interests (expectations and performance) are given a weighting of one to five. Test instrument with validity and reliability test. Starting from the problems with hotel customer complaints, followed by identification using the quality dimensions of Service Quality as outlined in the questionnaire then obtained gap and continued by analyzing data using DMAIC from Six Sigma,

## 4. Results and Discussion

### 4.1 Service Quality

From the results of the calculation of the gap as a whole shows that the lowest gap value is in the dimension of reliability or willingness to provide good service, namely the employee variable handles problems or complaints experienced by customers appropriately with a gap value of 1.4125 which means that it is in accordance with customer expectations, whereas The highest gap is the dimension of empathy or personal attention or employee sincerity, that is, the employee variable meets customer needs with a gap value of 0.6.

Measurement of customer satisfaction carried out by Four Seasons Resort At Jimbaran Bay is in accordance with the dimensions of physical evidence, reliability, responsiveness, assurance, and empathy as outlined in the questionnaire statement and distributed to hotel customers. Through the questions posed by the researcher, it is clear that the Four Seasons Resort At Jimbaran Bay pays close attention to the five dimensions of customer satisfaction that the results of customer perceptions obtained by the Four Seasons Resort At Jimbaran Bay have a good average in service. When viewed from the gap value in this study, all of which are positive, it indicates that the service has exceeded customer expectations.

**Table 1.** Perceived, Expectation, and Gap for Each Attribute

Dimension	Question Attribute	Customer Satisfaction		
		Perceived	Expectation	Gap
Tangible	X1.1 Four Season Resort At Jimbaran Bay has a complete, comfortable, clean and well-organized room interior	4.125	3.05	1.075
	X1.2 Four Season Resort At Jimbaran Bay has complete facilities such as swimming pools, fitness, conventions and spas as well as Food and Beverage outlets.	4	2.925	1.075
	X1.3 Four Season Resort At Jimbaran Bay has employees who look neat, clean, and attractive.	4.1125	3.0125	1.1
	X1.4 The Four Season Resort At Jimbaran Bay brochure provides clear information	4.025	3	1.025
Respon-sive-ness	X2.1 Four Season Resort At Jimbaran Bay employees provide maximum service.	4.0375	2.9125	1.125
	X2.2 Willingness and honesty of Four Season Resort At Jimbaran Bay employees in serving customers.	3.975	3.0875	0.888
	X2.3 The procedure for arranging room / event reservations and other transactions is accurate, fast and precise.	4.0125	3.1375	0.875
reliability	X3.1 Four Season Resort At Jimbaran Bay employees are responsive in answering customer questions.	3.9125	3.075	0.838
	X3.2 Four Season Resort At Jimbaran Bay employees appropriately handle problems or complaints experienced by customers.	4.325	2.9125	1.413
	X3.3 Four Season Resort At Jimbaran Bay employees provide the exact information customers need.	4.0625	3.1375	0.925
	X3.4 Four Season Resort At Jimbaran Bay employees respond to customer requests precisely and quickly.	3.8375	2.9625	0.875
assurance	X4.1 Four Season Resort At Jimbaran Bay employees are able to convince customers of hotel security.	4.0125	2.775	1.238
	X4.2 Four Season Resort At Jimbaran Bay has employees who have the competence and professionalism in serving customers.	4.175	3.1	1.075
	X4.3 Four Season Resort At Jimbaran Bay employees give customers the confidence to handle the problems faced by customers.	4.0125	3.0625	0.95
empathy	X5.1 Four Season Resort At Jimbaran Bay employees are able to establish good relationships with customers.	4.0625	3.05	1.013
	X5.2 Four Season Resort At Jimbaran Bay employees are able to communicate well.	3.95	3	0.95

X5.3	Four Season Resort At Jimbaran Bay employees are able to serve customers attentively.	3.625	3.025	0.6
X5.4	Four Season Resort At Jimbaran Bay employees meet customer needs.	3.5625	2.825	0.738

Source: The Result of Data Processing 2020

#### 4.2 Six Sigma

Through the servqual dimensions, the sigma values for each dimension are obtained. At the servqual calculation stage, the attributes and dimensions have been defined which are the parameters in assessing service quality. At the define stage, the results of the calculation show that the one with the biggest gap is attribute X5.3, i.e. employees meet customer needs. However, to be more certain, the next six sigma stage must be carried out to see other critical problems. Six sigma calculation aims to improve the quality of services and facilities by improving the variables / attributes that cause customers to be less satisfied.

**Table 2.** Baseline Performance Measurement Result at The Outcome Level Based on Attribute.

CTQ	Dimension	Perceived	Expected	Gap	Target Satisfaction	Satisfaction Level	DPMO	Sigma	
		(1)	(2)	(3) = (1)-(2)	(4)	(5) = [(1)/(4)] x 100%	(6) = 1 - (5) x 1.000.000	(7)	
1	tangible	X1.1	4.125	3.05	1.075	5	82.50%	175,000	2.43
2		X1.2	4	2.925	1.075	5	80.00%	200,000	2.34
3		X1.3	4.1125	3.0125	1.100	5	82.25%	177,500	2.42
4		X1.4	4.025	3	1.025	5	80.50%	195,000	2.36
5	responsiveness	X2.1	4.0375	2.9125	1.125	5	80.75%	192,500	2.37
6		X2.2	3.975	3.0875	0.888	5	79.50%	205,000	2.32
7		X2.3	4.0125	3.1375	0.875	5	80.25%	197,500	2.35
8	reliability	X3.1	3.9125	3.075	0.838	5	78.25%	217,500	2.28
9		X3.2	4.325	2.9125	1.413	5	86.50%	135,000	2.60
10		X3.3	4.0625	3.1375	0.925	5	81.25%	187,500	2.39
11		X3.4	3.8375	2.9625	0.875	5	76.75%	232,500	2.23
12	assurance	X4.1	4.0125	2.775	1.238	5	80.25%	197,500	2.35
13		X4.2	4.175	3.1	1.075	5	83.50%	165,000	2.47
14		X4.3	4.0125	3.0625	0.950	5	80.25%	197,500	2.35
15	empathy	X5.1	4.0625	3.05	1.013	5	81.25%	187,500	2.39
16		X5.2	3.95	3	0.950	5	79.00%	210,000	2.31
17		X5.3	3.625	3.025	0.600	5	72.50%	275,000	2.10
18		X5.4	3.5625	2.825	0.738	5	71.25%	287,500	2.06
	Mean		3.9903	3.002778	0.9875	5	79.81%	201,944	2.34

Source: The Result of Data Processing 2020

Measure stage is to measure the current level of importance obtained from measuring the gap between customer interest and satisfaction in servqual analysis and sigma level. The measurement stage begins by calculating the average level of performance, the average level of importance, the gap, target satisfaction, DPMO, and the level of sigma. At the six sigma stage, it will only calculate the level of satisfaction, DPMO, and sigma level. In this research, the target of satisfaction to be achieved is a score of 5, which is very satisfied, which comes from the answer to the Linkert scale of satisfaction from number 1, namely not satisfied to number 5, which is very satisfied. In this study, if the researcher sets a satisfaction target of 4, then almost all of the company's service attributes are already at 6 sigma. Therefore, the researchers set a scale of 5 as a satisfaction target.

In the Analyze stage, what is done is to analyze the main causes of problems in room service. In this stage, the attributes with the sigma value are below average. Based on the calculation of the sigma value, the average sigma level is 2,340 or is in 2 sigma conditions with a possible defect of 201,944 for a million service processes or 20.19% Defect Per Million Opportunities (DPMO). So it can be concluded that the desired sigma level is still far from the desired target, i.e. 6 sigma and DPMO 3,4. There are six service attributes that are below average.

In this research, the service process capabilities that have the highest negative gap value at the Four Season Resort At Jimbaran Bay are as follows: Process capabilities of the willingness and approval of employees in serving customers, Process capabilities of employees who are responsive to customer questions, Capabilities of employees to respond to customer requests appropriately and quickly, Employee process capabilities are able to communicate well, employee process capabilities are able to serve customers attentively, and employee process capabilities meet customer needs. In the fishbone diagram, the researcher sees what dominates the dissatisfaction, i.e. the dimension of empathy. If it is related to 5S in the service industry, it comes from skills, systems, and suppliers. Skills problems, the lack of service experience to problems found in the field are based on the lack of optimal training process, problems in communication, and the material provided is insufficient. The understanding of employees and servants in the trainee process, it can cause slow processing of problems that occur in the field in determining task timing of services at the Four Seasons Resort at Jimbaran Bay. The system that is the root of the problem is that the waiting time is long enough between one customers to another. And problems with suppliers of limited number of service goods. This study coincides with the high frequency of hotels where there is a peak in the density of the number of customers which causes the number of goods used services. While there are several customer breakfast menu requests when it is not in season. Some materials such as fruit, fish and other foodstuffs as well as the use of amenities items.

At the improve stage, it is recommended that management provide more and more easy-to-understand training material for employees, that the problem-solving process in the field can be resolved quite quickly. In this case the training that must be emphasized is the room technician that they can communicate better with customers who are at the Four Season Resort at Jimbaran Bay in order to speed up the process. Management can provide welcome drinks, entertainment, or chat with customers while waiting in the lobby due to limited buggies to pay attention to customers. Some customers like the little attention paid by employees. Allocating vacant room items to villas or customers who need them.

The DMAIC process control stage of Six Sigma cannot be implemented because the research site is temporarily closed in April - July 2020 due to the covid-19 outbreak.

## 5. Conclusion

Based on the distribution of questionnaires to respondents, data has been obtained between the perceptions and expectations of customers which lead to the level of customer satisfaction. Servqual calculation results show many positive values, which means the services provided are in accordance with expectations and it is known which service criteria have met customer satisfaction and which

variables need to be prioritized to get the main priority in getting attention in order to improve service quality.

The results of the six sigma calculation found dissatisfaction / complaints that occurred in the service process because the average value of DPMO was 201.944 and the sigma level of 2,34 on the satisfaction target was very satisfied or 5. The sigma level that has been achieved is still far from the desired target is 6 sigma and DPMO 3,4. Then the attribute that has the highest failure rate is "Employees meet customer needs" with DPMO 287.500 and sigma level. From the priority scale, it has been found that the contributing factors are the lack of experience and the trainer process that is not optimal and affects the service process that occurs at the Four Seasons Resort At Jimbaran Bay.

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