Improving Service Quality Using the Service Quality Method in Construction Projects (Case Study: Kwala Bulu Suspension Bridge Construction Project)

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ARTICLE INFO	ABSTRACT
  How to cite: S. Q. Jannah and I. Jaya, "Improving service quality using the service quality method in construction projects (case study: Kwala Bulu suspension bridge construction project)," Journal of Civil Engineering and Public Infrastructure Management, vol. 01, no. 01, 2025. 	The quality of service provided by construction service providers in Medan City is still not optimal, as evidenced by the number of project failures due to the performance of service providers. This study aims to measure the level of user satisfaction by comparing the perceptions and expectations of service users regarding the quality of service provided by service providers using the Service Quality (Servqual) method. Using a case study approach, this study employs a mixed method that combines a quantitative approach to analyze Servqual and a qualitative approach to identify the root causes of problems using a fishbone diagram. Based on the analysis of 25 Servqual attributes, 13 attributes have a positive value, meaning that service users are satisfied with the quality of service received. There were 12 attributes with negative values, meaning that service users were not satisfied and that service quality needed to be improved. Among the 12 attributes with negative values, there were 5 attributes from the tangible dimension, 1 attribute from the reliability dimension, 2 attributes from the responsiveness dimension, 3 attributes from the assurance dimension, and 1 attribute from the empathy dimension. Then, the root causes of the problems were identified from the interview data using a fishbone diagram, where the dominant aspects came from human (man) and method (method) factors. After identifying the root causes of the problems, improvements were proposed using the Kaizen (5W+1H) method, with a focus on improving human resource management and the internal work system. **Keywords:** *Construction, Fishbone, Kaizen, Servqual.*

1. Introduction

Actual data released by the Central Statistics Agency of North Sumatra Province in 2024 shows that the number of construction companies in North Sumatra reached 8,895 in 2023, of which 3,972 came from Medan City [1]. With so many construction companies in the Medan area, the performance of each company also varies. This is because science and technology have developed differently in the construction industry, which means each service provider has a different approach to service and product quality. The success of a project depends on the performance of its service provider (contractor). However, in Medan City, several service providers still experience performance problems where they experience failure due to negligence on the part of the service provider, both materials and workmanship do not meet the initial planning standards [2][3]. Therefore, to determine the extent to which customer satisfaction is met and the best way to implement changes in service quality, a service quality assessment is needed. Service quality is a comparison between the level of service provided by the service provider and customer expectations [4]. Service quality is one of the factors that influence customer satisfaction in using a company's services [5]. Customer satisfaction occurs when the

service experience meets or exceeds customer expectations [6]. In the construction world, customer satisfaction is significantly influenced by service quality, timely project completion, and budgeted costs [7].

CV. Metro Konsindo is a Medan-based construction services company specializing in concrete structures and has a strong reputation in the construction sector. However, according to the Head of Administration of the Ministry of Public Works and Public Housing, as a service user, CV. Metro Konsindo's implementation of the Occupational Safety and Health (K3) system on the Suspension Bridge construction project in Tangkahan, Langkat, North Sumatra, is considered suboptimal. The implementation of the K3 system is known to play a crucial role in improving service quality and customer satisfaction on construction projects because it can reduce the risk of accidents, maintain smooth work activities, and ensure project completion on time and in accordance with quality standards. This aligns with the view that good safety management has a direct impact on customer satisfaction, as work processes become more controlled and reliable [8]. The better the implementation of K3, the higher the perception of service quality, and the greater the customer satisfaction (in line with service quality).

Therefore, this study was conducted to evaluate the level of customer satisfaction with the services provided by CV. Metro Konsindo using the Servqual approach. The Servqual method measures customer satisfaction by comparing expectations and perceptions of the service received based on five dimensions: tangibles, reliability, responsiveness, assurance, and empathy [9]. The tangibles dimension relates to the appearance and performance that can be seen in real life, such as facilities, equipment, and materials used in the service process [10]. The reliability dimension is the ability to provide promised services quickly, accurately, and satisfactorily [11]. The responsiveness dimension refers to the responsiveness or alertness of employees in helping customers and providing fast service [10]. The assurance dimension relates to the service provider's ability to instill trust in its customers [10]. The empathy dimension includes ease of communication, good communication, personal attention, and understanding of customer needs [11]. By using this method, service providers can identify gaps in service delivery and implement necessary improvements. This research is also expected to be a basis for improving and refining services in the coming years to achieve the goal of increasing customer satisfaction.

2. Method

This study employed a mixed-methods approach, with data obtained through questionnaires and interviews. The study was conducted by distributing questionnaires with a Likert scale and conducting interviews with respondents. Respondents were service users selected using purposive sampling. Purposive sampling is a sampling technique based on specific considerations, such as those considered to be the most knowledgeable or to best understand the data sought by the researcher [12]. The sample selection in this technique was deliberately based on specific considerations relevant to the research objectives [13]. Based on several criteria established by the author, particularly direct involvement in interacting with service providers, the respondents consisted of six individuals from various positions: the Commitment Making Officer (PPK), Administrative Officer, Treasurer, Field Supervisor Coordinator, Technical Administrator, and General Administrator.

The validity and reliability of the questionnaire results were tested, then a Servqual analysis was conducted to identify negative and positive gaps in each attribute of each Servqual dimension. Meanwhile, the interview results were used to find the root causes of the problems using a fishbone diagram. Data processing in this study was assisted by the Statistical Program for Social Science (SPSS) version 26 and Microsoft Excel.

3. Result and Discussion

3.1 Data

Primary data for this study was obtained directly from respondents through questionnaires and interviews, namely the perceptions and expectations of service users with respect to the service provider quality. Secondary data for this study was obtained from project-related documents, including project profiles, organizational structures (service users), and progress reports.

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3.2 Validity Test

Table 1. Validity Test Results.

Number	Attribute	Perception			Expectation		
		R Count	*R Table*	*Result*	*R Count*	*R Table*	Result
1	T1	0.891	0.811	Valid	0.823	0.811	Valid
2	T2	0.966	0.811	Valid	0.906	0.811	Valid
3	T3	0.890	0.811	Valid	0.815	0.811	Valid
4	T4	0.866	0.811	Valid	0.840	0.811	Valid
5	T5	0.958	0.811	Valid	0.820	0.811	Valid
6	RB1	0.856	0.811	Valid	0.978	0.811	Valid
7	RB2	0.948	0.811	Valid	0.882	0.811	Valid
8	RB3	0.859	0.811	Valid	0.893	0.811	Valid
9	RB4	0.982	0.811	Valid	0.843	0.811	Valid
10	RB5	0.936	0.811	Valid	0.856	0.811	Valid
11	RS1	0.903	0.811	Valid	0.962	0.811	Valid
12	RS2	0.973	0.811	Valid	0.914	0.811	Valid
13	RS3	0.897	0.811	Valid	0.819	0.811	Valid
14	RS4	0.819	0.811	Valid	0.902	0.811	Valid
15	RS5	0.869	0.811	Valid	0.862	0.811	Valid
16	A1	0.913	0.811	Valid	0.809	0.811	Valid
17	A2	0.939	0.811	Valid	0.892	0.811	Valid
18	A3	0.857	0.811	Valid	0.935	0.811	Valid
19	A4	0.866	0.811	Valid	0.832	0.811	Valid
20	A5	0.90	0.811	Valid	0.882	0.811	Valid
21	E1	0.836	0.811	Valid	0.891	0.811	Valid
22	E2	0.881	0.811	Valid	0.90	0.811	Valid
23	E3	0.941	0.811	Valid	0.889	0.811	Valid
24	E4	0.970	0.811	Valid	0.991	0.811	Valid
25	E5	0.838	0.811	Valid	0.941	0.811	Valid

Based on the results of the r table from $N=6$ (N = number of respondents) at a significance level of 5% in the distribution of r table values, a value of 0.811 was obtained. Then, the calculated r value from the results of calculations using SPSS software will be compared with the known r table value. Attribute data is declared valid if the calculated $r > r$ table.

In Table 1 it can be inferred, the calculation results obtained from the 6 respondents' answers that underwent validity testing, both the perception and expectation attribute instruments were generally valid because all calculated r values were greater than the table r value. Therefore, all questionnaire attributes could proceed to the next stage.

3.2 Reliability Test

Reliability testing aims to ensure that data remains reliable even when tested repeatedly and over a long period of time.

Table 2. Perception Reliability Test Results.

Reliability Statistic		
Cronbach's Alpha	N of Items	Description
0.958	25	Reliable

Table 3. Expectation Reliability Test Results.

Reliability Statistic		
Cronbach's Alpha	N of Items	Description
0.915	25	Reliable

In table 2, the results of the perception reliability test using the Cronbach's Alpha formula, obtained a calculated r of 0.958. Because the calculated r is greater than the table r, which is 0.6, the results of the perception reliability test are declared reliable. And in table 3, the results of the expectation reliability test using the Cronbach's Alpha formula obtained a calculated r of 0.915. Because the calculated r is greater than the table r, which is 0.6, the results of the reliability test are declared reliable.

3.3 Servqual Analysis

If the gap value is positive (satisfied), then the gap value is negative (dissatisfied). In this study, there are five dimensions of calculation that will be measured using the Servqual method. The Servqual score can be calculated using the following formula [9]:

$$\text{Servqual Calculation} = \text{Average perception score} - \text{Average expectation score} \tag{1}$$

Table 4. Expectation Reliability Test Results.

Dimension	Attribute	Perception Variable	Expectation Variable	Gap Result	Description
Tangibles	T1	3.83	4.16	-0.33	Negative
	T2	4.83	4.16	-0.33	Negative

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Dimension	Attribute	Perception Variable	Expectation Variable	Gap Result	Description
	T3	4.33	4.5	-0.16	Negative
	T4	3.33	4.33	-1	Negative
	T5	3.66	3.83	-0.16	Negative
Mean		**3.09**	**4.19**	**-0.39**	
	RB1	4	4	0	Positive
	RB2	4.5	4.33	0.16	Positive
Reliability	RB3	4.16	4.33	-0.16	Negative
	RB4	4.33	4.16	0.16	Positive
	RB5	4.16	4	0.16	Positive
Mean		**4.23**	**4.16**	**0.06**	
	RS1	3.83	4.16	-0.33	Negative
	RS2	4.5	4.5	0	Positive
Responsiviness	RS3	4.33	4.33	0	Positive
	RS4	4.16	4.16	0	Positive
	RS5	4.33	4.66	-0.33	Negative
Mean		**4.23**	**4.36**	**-0.13**	
	A1	4.33	3.66	0.66	Positive
	A2	3.66	3.83	-0.16	Negative
Assurance	A3	4	4.5	-0.5	Negative
	A4	4.33	4.16	0.16	Positive
	A5	4.16	4.66	-0.5	Negative
Mean		**4.09**	**4.16**	**-0.06**	
	E1	4.16	4.16	0	Positive
Empathy	E2	4.16	4.16	0	Positive
	E3	4.16	4.5	-0.33	Negative

Dimension	Attribute	Perception Variable	Expectation Variable	Gap Result	Description
Empathy	E4	4.5	4.33	0.16	Positive
	E5	4.33	4.16	0.16	Positive
Mean		**4.26**	**4.26**	**-0.002**	

Table 4 shows the results of the calculation using the servqual method through the calculation of gaps from five dimensions and all attributes from both perception and expectation variables, there are 13 attributes obtained positive gap results (customers are satisfied) and 12 attributes obtained negative gap results (customers are dissatisfied). These results indicate that there are customer expectations or desires that have not been met so that a more in-depth analysis is needed to determine the root of the problem.

3.4 Service Quality in Each Dimension

To analyze the quality of services provided by service providers, the following formula is used [9] :

$$\text{Service Quality} = \frac{\text{Assessment Perception}}{\text{Assessment Expectation}} \tag{2}$$

Table 5. Service Quality Table for Each Dimension.

Dimension	Perception (P)	Expectation (E)	GAP	$Q = P/E$
Tangible	3.996	4.196	-0.396	0.95234
Reliability	4.23	4.164	0.064	1.01585
Responsiviness	4.23	4.362	-0.132	0.96974
Assurance	4.096	4.162	-0.068	0.98414
Empathy	4.262	4.262	-0.002	1
Mean	**4.1628**	**4.2292**	**-0.1068**	**0.984414**

In table 5, we can see the results of the service quality calculation of $Q = 0.984414 < 1$, meaning that the service quality at CV. Metro Konsindo is declared less than good.

3.5 Identification of Root Causes

The root causes of the problems in this study were identified using a fishbone diagram based on interview data from respondents. A fishbone diagram is a root cause analysis tool designed to identify the causes and effects of problems in research [14].
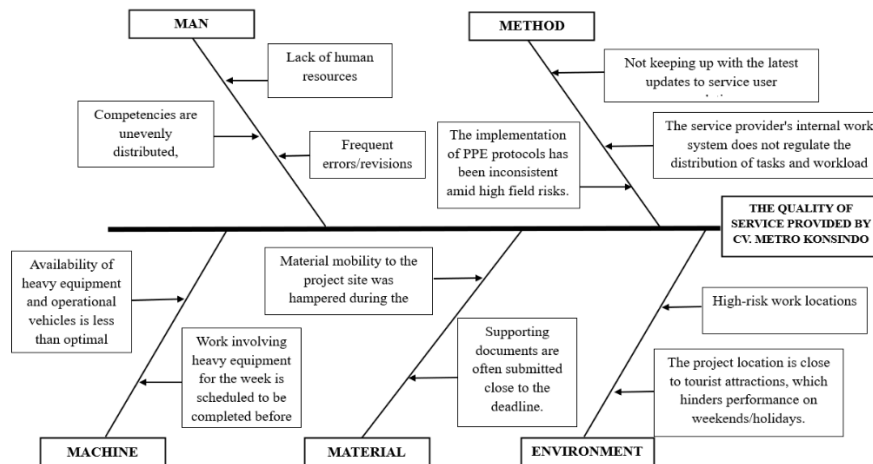

Figure 1. Root cause in a fishbone diagram.

Figure 1 shows a fishbone diagram with five problem aspects: people, methods, machines, materials, and the environment. Each aspect contains several root causes. The root causes identified were primarily human and methods (based on interviews with respondents).

3.6 Improvement Proposal

The purpose of the 5W+1H analysis is to provide corrective actions for problems that occur in order to improve quality. The proposed improvements in the study use the kaizen method based on the results of identifying the root causes of problems using a fishbone diagram. The Kaizen (5W+1H) method involves questions that will link the problems that occur [15]. From the results of the analysis, the proposed improvements focus on improving aspects of human resource management and improving the internal work system.

4. Conclusion

The level of user satisfaction with service providers has not been fully met, as indicated by an average SERVQUAL gap value of -0.1068 and a Q value of $0.984 < 1$. The dominant factors originate from Human Resources (lack of competent personnel) and Methods (work systems that do not regulate the distribution of tasks and workloads proportionally). A service quality improvement strategy has been developed using the Kaizen (5W+1H) approach, focusing on improving human resource management and internal work systems. The results of this study are expected to serve as a reference for measuring a company's service quality by comparing the SERVQUAL method with the Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI) methods in future research.

5. Acknowledgements

6. Conflict of Interest

The authors of this work attest to the absence of conflicts of interest.

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