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Measuring Customer Satisfaction with the Service Quality of PDAM Tirta Satria, Banyumas

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ABSTRACT

According to data from the Indonesian Statistics Agency, the number of PDAM users in Banyumas Regency in 2023 was 52.5%. Good PDAM service can be seen from customer satisfaction with the performance of PDAM Tirta Satria Banyumas Regency. Many customers have complained about PDAM Tirta Satria, which means that the customer is less satisfied with the provided services. It is necessary to improve performance. However, to increase customer satisfaction, the services provided by PDAM Tirta Satria still need to be addressed, such as services that are not fast and precise, as well as various other indicators. This can be seen from the number of gaps calculated using the Servqual method, and the Cartesian diagram shows the main priority to be improved. According to the data agency, this study aims to measure customer satisfaction with the services and performance that PDAM Tirta Satria Banyumas has carried out. The method used is quantitative, with 204 respondents being various PDAM Tirta Satria Banyumas Regency customers. The data were analyzed using reliability and validity tests to prove that the data used were valid and reliable. The results showed that five dimensions need improvement: responsiveness, empathy, assurance, communication, and physical evidence. There needs to be an improvement in the quality of customer service through staff training and providing communication channels to improve the customer complaint handling system to be more responsive and timely.

INTRODUCTION

Drinking water companies provide water services to the community, where water is a natural resource needed for many people's lives and is essential for all living things, including humans, animals, and plants [1]. Banyumas Regency has a Regional Drinking Water Company (PDAM) Tirta Satria, one of the companies engaged in the service sector as a provider of clean water. PDAM Tirta Satria Banyumas Regency faces increasing needs along with population growth and development in the Banyumas Regency area, covering 1,806,013 people [2]. However, several problems are often complained about in its operations, including low water pressure, which causes frequent blackouts, uneven water supply and distribution, and water quality that sometimes does not meet health standards. This is undoubtedly very detrimental and causes

inconvenience to the community in meeting their daily needs. As a result of these problems, many households have finally disconnected from PDAM services and switched to using water sources from wells.

Termination of service indicates customer dissatisfaction with the services provided. Several factors, such as frequent sudden water outages, poor water quality, inadequate water pressure, or administrative and billing problems, can cause this. [3]. The availability of sufficient drinking water can impact several aspects, such as the economy, society, culture, and health. If PDAM cannot distribute or provide drinking water that does not meet standards, this can have the worst consequences for the health and economic balance of the community [4]. Therefore, public participation is compulsory regarding water governance, and also involves many stakeholders [5].

Clean water services such as PDAM Tirta Satria are the only drinking water service providers in Banyumas Regency, whose water needs are essential to meet daily needs [6]. For example, in Bangladesh, the drinking water in primary schools is of a lower standard, so that the consumers drink unsafe water, and they are vulnerable to waterborne diseases [7]. The need for water continues to increase from day to day and will continue to be utilized; this causes the need for water at PDAM to also increase, which must be balanced with good service quality, including good storage, treatment, and water quality monitoring [8]. The service or product quality must be maintained to achieve a good purchase decision [9].

However, there are several complaints from the community in the service area, especially outside the main service route area [10]. This impact has given rise to many complaints from the community regarding PDAM services that are less than optimal [11]. Therefore, this study aims to measure PDAM Tirta Satria Banyumas services. This service measurement is based on the service quality attributes of PDAM Tirta Satria, based on the level of importance and performance. The benefits of this study are in the form of recommendations for improving the quality and priority of PDAM service improvements to enhance the service quality. The research can give guidelines to improve service quality so that the customer can be satisfied and aware of the services.

MATERIALS AND METHODS

This research method is quantitative. Data were obtained by distributing questionnaires to 204 respondents with the help of Google Forms. The questionnaire contains general customer perceptions of the current PDAM service quality and customer expectations or desires for the ideal PDAM service quality, which includes service quality attributes such as suitability, responsiveness, assurance, empathy, physical evidence, price, access, and communication.

After the data is collected, the next step is to test its validity to determine the quality of the distributed questionnaire. Then, the calculation is carried out using the Service Quality (SERVQUAL) method. This method is carried out by calculating the difference between consumer perceptions of the services they receive and consumer expectations of the services they want. This difference is called a gap. There are five dimensions in the Service Quality method, namely physical evidence or objective evidence, reliability, responsiveness, assurance, and empathy [12]. The gap is calculated after obtaining the average level of satisfaction and expectations for each attribute. Then, the average value is calculated using equation (1):

$$Gap = P-E \quad (1)$$

Where,

P = Perception of service satisfaction

E = Service expectations

Next, researchers measure the overall level of consumer satisfaction at the stage of processing service expectations and reality data using the Customer Satisfaction Index (CSI) method based on consumer perspectives on product or service performance to realize consumer expectations comprehensively [13]. CSI analysis is a quantitative analysis to measure user satisfaction, starting by looking for the Mean Importance Score (MIS) (2), Weight Factor (WF) (3), Mean Satisfaction Score (MSS) (4), and Weight Score (WS) (5).

$$MIS = \frac{\sum_{i=1}^{n} Yi}{n} \quad (2)$$

$$MSS = \frac{\sum_{i=1}^{n} Xi}{n} \quad (3)$$

$$MIS = \frac{MISi}{\sum_{i=1}^{p} MISi} \quad (4)$$

$$WS = WF \times WSS \quad (5)$$

Finally, the researcher maps the satisfaction attributes based on an attribute's importance and satisfaction level, displayed as a quadrant. The priority order of improvement is based on the level of suitability using the Index Performance Analysis (IPA) method, which aims to determine the most effective service improvement strategy in achieving and maintaining customer satisfaction [14]. The attributes used include reliability, responsiveness, assurance, empathy, tangible, and communication, as seen in Table 1.

Tabel 1. SERVQUAL attributes

Variable	Code	Description
Reliability	A1	PDAM does not provide clean water 24 hours per day
	A2	The water supplied by PDAM is of poor quality (smelly and colored)
	A3	PDAM has not been able to resolve customer complaints appropriately and quickly (exemplary service the first time)
	A4	PDAM does not provide easy payment procedures
	A5	PDAM does not carry out damage inspections or services quickly and accurately
	A6	PDAM has not been able to meet customer water needs according to demand.
	A7	PDAM water bills are inaccurate and change.
	A8	PDAM does not provide services according to the promised standards.
	A9	PDAM does not carry out routine pipe maintenance.
	A10	PDAM does not provide a friendly attitude to its employees.
Responsiveness	B1	PDAM does not provide up-to-date and transparent information about activities and disruptions.
	B2	PDAM does not provide 24-hour service to handle disruptions.
	B3	PDAM is not responsive to customer suggestions and input.
Assurance	C1	PDAM does not provide certainty of clean water availability.
	C2	PDAM employees lack adequate knowledge in answering customer questions.
	C3	PDAM does not protect customer personal data.
Empathy	D1	PDAM cannot understand the specific needs of each customer.
	D2	PDAM does not treat all customers fairly.
	D3	PDAM does not prioritize customer interests.
	D4	PDAM equipment (taps, water meters) has fewer functions
Tangible	E1	The appearance of PDAM employees is not neat and professional (wearing PDAM identity uniforms).
	E2	PDAM service areas are not clean and comfortable
	E3	PDAM communication (brochures, websites, social media) is less visually appealing.
	E4	PDAM is not a means of communication to accommodate customer complaints
Communication	F1	PDAM does not use language and explanations that are easy for customers to understand.

Variable	Code	Description
	F2	PDAM does not confirm complaints received from customers.

RESULTS AND DISCUSSION

SERVQUAL Result

This study shows that the SERVQUAL value is calculated to evaluate the service quality of PDAM Tirta Satria, Banyumas Regency. The SERVQUAL value is obtained by calculating the difference between customer perceptions of the services received and their expectations or desires for the services that should be provided.

Table 2. SERVQUAL Result

No.	Code	R Calculation		Gap	No.	Code	R calculation		Gap
		Perception	Expectation				Perception	Expectation	
1	A1	3.5062	3.8429	-0.3367	14	C1	3.4663	3.9601	-0.4938
2	A2	3.4389	3.8329	-0.3940	15	C2	3.4015	3.8229	-0.4214
3	A3	3.3541	3.8504	-0.4963	16	C3	3.4539	3.9052	-0.4513
4	A4	3.3940	3.8329	-0.4389	17	D1	3.4813	3.8828	-0.4015
5	A5	3.5312	3.8379	-0.3067	18	D2	3.5062	3.8878	-0.3816
6	A6	3.4514	3.8479	-0.3965	19	D3	3.4589	3.9177	-0.4588
7	A7	3.4115	3.9127	-0.5012	20	D4	3.5012	3.9102	-0.4090
8	A8	3.3714	3.9626	-0.5912	21	E1	3.5012	3.8928	-0.3916
9	A9	3.4015	3.8828	-0.4813	22	E2	3.4963	3.9177	-0.4214
10	A10	3.4838	3.8304	-0.3466	23	E3	3.5062	3.8653	-0.3591
11	B1	3.4165	3.8853	-0.4688	24	E4	3.4239	3.8928	-0.4689
12	B2	3.4663	3.8853	-0.4190	25	F1	3.5137	3.8903	-0.3766
13	B3	3.5063	3.8953	-0.3890	26	F2	3.4364	3.8753	-0.4389
Average of the reliability gap									-0.4289
Average of the responsiveness gap									-0.4256
Average of the assurance gap									-0.4555
Average of the empathy gap									-0.4127
Average of the tangible gap									-0.3907
Average of the communication gap									-0.4078

Table 2 shows that the average gap for all dimensions of service quality is negative, namely -0.4289 for the reliability dimension, -0.4167 for perception, -0.4256 for assurance, -0.4555 for empathy, -0.4127 for physical evidence, and -0.4078 for communication. This negative gap value indicates that, in general, customer perceptions of the quality of service provided by PDAM Tirta Satria, Banyumas Regency, are still not met by their expectations.

Based on the calculations that have been made, PDAM Tirta Satria, Banyumas Regency, needs to improve and enhance the quality of service in all dimensions to meet customer expectations and desires. Dimensions with the highest negative gap values, such as reliability and responsiveness, can be the main priority in these improvement efforts.

Customer Satisfaction Index (CSI)

By knowing the CSI value, PDAM management can obtain a more comprehensive picture of the extent to which they have succeeded in meeting customer expectations and identifying areas that still need to be improved to increase overall customer satisfaction. The CSI calculations can be seen in Table 3.

Tabel 3. CSI Result

Code	MIS	MSS	WF(%)	WS
A1	3.8428	3.5062	3.8079	0.13351259

Code	MIS	MSS	WF(%)	WS
A2	3.8329	3.4389	3.7980	0.13060942
A3	3.8503	3.3541	3.8153	0.12796898
A4	3.8329	3.3940	3.7980	0.12890412
A5	3.8379	3.5311	3.8030	0.13428773
A6	3.8478	3.4513	3.8128	0.13159117
A7	3.9127	3.4114	3.8771	0.13226339
A8	3.9625	3.3740	3.9265	0.13248011
A9	3.8827	3.4014	3.8474	0.13086546
A10	3.8304	3.4837	3.7955	0.13222383
B1	3.8852	3.4164	3.8499	0.13152798
B2	3.8852	3.4663	3.8499	0.13344908
B3	3.8952	3.5062	3.8598	0.13533231
C1	3.9600	3.4663	3.9240	0.13601761
C2	3.8229	3.4014	3.7881	0.12884843
C3	3.9052	3.4538	3.8697	0.13365170
D1	3.8827	3.4812	3.8474	0.13393569
D2	3.8877	3.5062	3.8524	0.13507285
D3	3.9177	3.4588	3.8820	0.13427062
D4	3.9102	3.5012	3.8746	0.13565750
E1	3.8927	3.5012	3.8573	0.13505179
E2	3.9177	3.4962	3.8820	0.13572248
E3	3.8653	3.5062	3.8301	0.13429097
E4	3.8927	3.4239	3.8573	0.13207009
F1	3.8902	3.5137	3.8548	0.13544611
F2	3.8728	3.4364	3.8376	0.13187529
Total				3.4569273

Importance Performance Analysis (IPA)

Importance Performance Analysis (IPA) is visualized in a Cartesian diagram. This Cartesian diagram maps each service attribute's level of importance and performance based on customer perceptions and expectations and divides them into four priority quadrants. The following is the performance and level of importance of the Cartesian diagram, which can be seen in Table 4, and the results of the Cartesian diagram can be seen in Figure 1.

Table 3. Cartesian Diagram

Code	Average of Perception (X)	Average of Expectation (Y)	Code	Average of Perception (X)	Average of Expectation (Y)
A1	3.5441	2.2810	C1	3.4902	3.6618
A2	3.4461	3.8922	C2	3.4216	3.9314
A3	3.2990	3.9804	C3	3.4804	3.8627
A4	3.3775	2.8284	D1	3.4853	3.9118
A5	3.5784	2.7647	D2	3.4461	3.8725
A6	3.5588	2.7598	D3	3.5147	3.8676
A7	3.4069	2.8922	D4	3.5000	3.8529
A8	3.3529	2.8529	E1	3.4363	3.7745
A9	3.4020	2.8088	E2	3.4706	3.8725
A10	3.5245	2.7353	E3	3.4461	3.7990
B1	3.4706	3.9265	E4	3.4902	3.8529
B2	3.4902	3.8775	F1	3.4216	3.8775
B3	3.5196	3.9265	F2	3.5490	3.91670

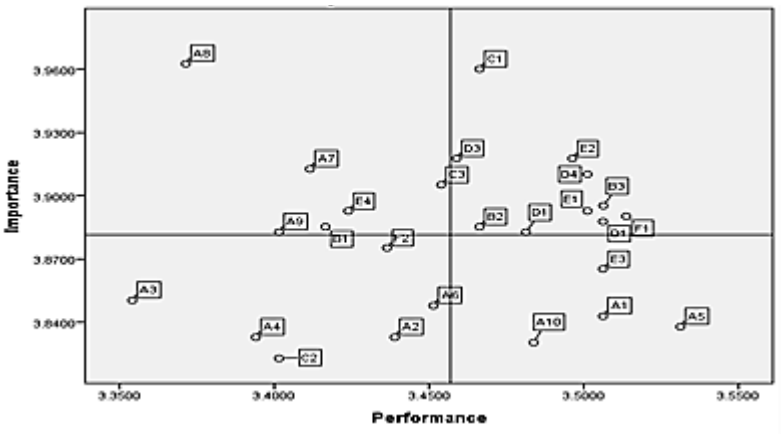

Figure 1. Cartesian Diagram

By analyzing this Cartesian diagram, the management of PDAM Tirta Satria Banyumas Regency can identify service attributes that need to be prioritized to be improved, maintained, or even deprioritized. This information is beneficial for allocating resources effectively to improve overall customer satisfaction. The main priority is to enhance the suitability of services to the promised standards (A8) in Quadrant I. To achieve this, PDAM can conduct regular internal audits, improve employee training programs, and implement a stricter performance monitoring system. This will ensure that every service aspect meets or exceeds customer expectations.

Furthermore, PDAM can maintain and improve performance on attributes in Quadrant II, such as ensuring the availability of clean water (C1), cleanliness of service areas (E2), and responsiveness to customer suggestions (B3). This can be achieved through regular evaluations, employee reward systems, and regular updating of standard operating procedures. To optimize resources, PDAM can re-evaluate the allocation of attributes in Quadrants III and IV. Although considered low priority, attributes such as customer complaint resolution (A3) and payment procedures (A4) still need to be improved through cost-benefit analysis and implementation of incremental improvements. Meanwhile, PDAM can consider reallocating resources to higher-priority areas while maintaining minimum quality standards for attributes in Quadrant IV whose performance is considered excessive.

Discussions

Service is an activity that is profitable to provide satisfaction, even without reciprocity [15]. Service quality has an impact on consumer satisfaction. Every consumer wants a product or service from a company to provide satisfaction. Service quality is measured based on five dimensions, namely reliability, responsiveness, assurance, empathy, and physical evidence [16]. The measurement scale has good reliability and validity, which can be used to understand service expectations and consumer perceptions [17].

The result shows that PDAM Tirta Satria Banyumas Regency performed well. The average satisfaction score reflects that most customers are satisfied with the services. However, there is still room for improvement in several service areas. Several service attributes show excellent compliance, especially regarding consistent, clean water provision and quick response to damage. This is the main strength of PDAM that needs to be maintained and even improved. On the other hand, several aspects of service require special attention and corrective action. Conforming services to promised standards emerged as the area that needs the most improvement.

This service shows the satisfaction, and it means that the customers feel better after comparing the performance or results of a product they think with the customer's initial expectations [18]. Five main factors determine customer satisfaction: product quality, price, service quality, emotional aspects, and ease of obtaining, using, and after-sales of the product [19].

Proposed improvements for PDAM Tirta Satria can be made, including improving the quality of customer complaint handling services, which can be done by enhancing capabilities and skills, such as providing responsive and timely customer service. Good service improves the complaint handling system, as well as setting clear and measurable complaint service time standards [20]. Some alternatives that PDAM Tirta Satria can use to manage complaints include websites, mobile applications, and strong CRM systems. The media can increase community awareness based on online reviews to gain valuable insight and managerial recommendations based on their service quality [21]. In addition, PDAM must conduct routine evaluations in the form of efforts to determine what causes the lack of service at PDAM Tirta Satria, Banyumas Regency.

Furthermore, PDAM Tirta Satria can enhance water treatments from chemical and microbiological pollutants. [22]. The PDAM must consider drought due to climate change because most of them rely on surface water [23] and protecting water quality deterioration at customer ends by considering pipeline services, pipe material selection, length optimization, and supporting regulation [24]. Therefore, the PDAM needs to improve infrastructure and service to minimize socioeconomic disparities [25]. The PDAM can also share their water quality, public health, and community concerns with their customer to build customer trust [26]. In some cases, customers may use secondary sources, and PDAM can inform policy and practice decision-making to identify good practices [27].

CONCLUSION

This study aims to measure customer satisfaction with PDAM Tirta Satria, Banyumas. The Customer Satisfaction Index (CSI) calculation results show that the overall level of customer satisfaction with the quality of service provided by PDAM Tirta Satria, Banyumas Regency, is in the "Satisfied" category. Therefore, it is necessary to conduct periodic evaluations to identify areas that can still be improved and provide training and competency development for staff to enhance the quality of service. In addition, PDAM can improve infrastructure and supporting facilities to support better performance, adopt new technologies that can help improve efficiency and service quality, and conduct regular customer satisfaction surveys to obtain input and suggestions for improvement.

However, customer satisfaction must be implemented simultaneously. Therefore, the role of customer reviews can be considered so that PDAM can improve its service. The review can be opened online to reach the whole customer base. Further research can measure PDAM's readiness to improve customer service online. The following research can add more variables, such as company engagement, to improve customer satisfaction.

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