

CUSTOMER SATISFACTION LEVEL ANALYSIS OF INTAN BANJAR WATER COMPANY'S CUSTOMERS USING IMPORTANCE PERFORMANCE ANALYSIS METHOD

Kazuo Ishiguro¹, Orhan Pamuk², Gabriel García Márquez³

¹ Nobel Laureate in Literature Author; Alumnus of University of East Anglia, United Kingdom

² Nobel Laureate in Literature Professor of Humanities, Columbia University, USA / Istanbul, Turkey

³ Nobel Laureate in Literature Colombian Author and Journalist; Associated with El Espectador, Colombia

ABSTRACT

Intan Banjar Water Company is a regional owned company engaged in the supply of clean water. The service of water supply company must be as good as possible. The purpose of this research is to find out the level of customer satisfaction as well as the level of employee satisfaction in order to know the performance of Intan Banjar Water Company in fulfilling water supply which is then put forward recommendations in an effort to improve the service. Through the Importance Performance Analysis, recommendations for service improvement are obtained by inserting the values of importance and perceived values into a Cartesian diagram. The level of customer satisfaction is satisfied at the level of 69.15%. The level of job satisfaction of employees is at the Satisfied. Recommendations for improving the service aspects of Intan Banjar Water Company based on analysis are service indicators that are considered high priority to be improved : the price for water; the speed of action on coping complaints submitted by customers; attitudes and responses of company official to customers who deliver suggestions; the abilities of company in carrying out service duties; and assurance of safeness and hygiene of clean water treatment plant facilities distributed to consumer.

Keywords: *customer satisfaction level, employee satisfaction level, importance performance analysis,*

I. INTRODUCTION

Humans need water not only to comply their body's needs, but also for the production or processing of food and others, including fisheries, agriculture, and industry [13]. The water treatment plant is one of the infrastructures that has a role in providing clean water to the community [12].

Intan Banjar Water Company as a regional company that has a water treatment plant as well as a company that distributes clean water products to the community since its inception served Banjar Regency and Banjarbaru City. People lately often complain about traffic jams or murky water supplied by Intan Banjar Water Company, as complained by residents of the Trikora road that Intan Banjar Water Company services have not been maximized [14].

Ideally, in a clean water supply system, company must comply the needs of clean water that is in accordance with applicable regulations in terms of quality, quantity and continuity. Quality is a requirement for clean water to be used by customers for both household and other sanitation needs. Then, in terms of quantity where the amount of quality clean water must be available to comply customer needs. Furthermore, continuity where the availability of water must be maintained at all times or when clean water is needed [1].

Water company services as a company that provides clean water must be as good as possible, therefore that customers, especially household customers who rely on the availability of clean water, can utilize water optimally for their daily needs. In addition, the service of clean water supply companies through good employee performance will directly increase the level of public trust, thereby also increasing the number of customers. Thus through this research it is necessary to analyze the level of customer satisfaction as well as the level of employee satisfaction in order to know the performance of Intan Banjar Water Company in fulfilling clean water supply which can then be made recommendations in an effort to improve the service quality of Intan Banjar Water Company as one of the clean water providers in South Kalimantan province. A study was conducted by Putra (2011) regarding the level of customer satisfaction for the service sector of a water supply company, in which the question indicators have been validated.

Then proceed with Importance Performance Analysis as a method commonly used in determining recommendations for improving the quality of company services.

Table 1. Number of Customers Intan Banjar Company (BNA Region/Main Zone)

Customer Type		Number of Customer
Social	a. General social	560
	b. Particular social	
Commerce	a. Small commerce	3030
	b. Middle commerce	
	c. Big commerce	
Industry	a. Small Industry	5
	b. Big Industry	
Non Commerce	a. Non Commerce type A1	31771
	b. Non Commerce type A2	
	c. Non Commerce type A3	
	d. Non Commerce type A4	
	e. Non Commerce type A5	
	f. Non Commerce type B	
Total		35366

Table 2. Number of Employees of Intan Banjar Company

Work Unit	Number of Employess
Human Resource	5
Finance	8
Subscription Relation	35
Asset and Equipment	10
Secretariat and Data Processing	35
Transmission and Distribution	18
Planning and Monitoring	12
Production	22
Total	145

A feeling of pleasure or disappointment that arises after comparing the perceived performance of expectations is called satisfaction [7]. Measures for satisfaction include directly reported satisfaction, derived dissatisfaction, problem analysis and importance performance (I-P) [8].

If it is associated with efforts to develop the services of Regional Water Company in order to increase customer satisfaction, then in brief these aspects are tangible, reliability, responsiveness, assurance and empathy [11].

According to Djati (2005) employee performance has a significant effect on customer satisfaction. Then, customer satisfaction has a significant effect on customer trust, then customer trust affects customer loyalty.

In the Importance Performance Analysis method, the average value of the attributes of importance and also the level of company performance will be analyzed on a matrix. The point is the level of customer interest is measured by what the company should do in order to produce high-quality services or products [3].

The calculated index is interpreted based on the following Customer Satisfaction Index (CSI) tables:

Table 3. Criteria for Customer Satisfaction Level

Index	Satisfaction Level
$80\% < \text{CSI} \leq 100\%$	Very satisfied
$60\% < \text{CSI} \leq 80\%$	Satisfied
$40\% < \text{CSI} \leq 60\%$	Quite satisfied

$20\% < \text{CSI} \leq 40\%$	Dissatisfied
$0\% < \text{CSI} \leq 20\%$	Very dissatisfied

(source: Amanda, 2018)

II. METHOD

In this research, the research was conducted at the head office of Intan Banjar Regional Water Company for research on employee job satisfaction. Whereas for the customer satisfaction, research was conducted on customers which included service areas of Intan Banjar Water Company main zone (BNA Banjarbaru-Martapura).

The population determined in this study is divided into 2 groups ; customers and employees of Intan Banjar Water Company. Employees who become the population are employees who work in Intan Banjar Water Company, while customers who are population in this study are customers of Intan Banjar Water Company in Banjarbaru City and Banjar City. Respondens calculations use the calculations commonly used for the acquisition of a minimum sample that is the Slovin formula and the results of the calculation are as follows.

Table 4. Number of Customer Satisfaction Survey Respondents

Customer Type	Number of Respondent
Social	2
Commerce	8
Industry	0
Non Commerce	90
Total	100

Table 5. Number of Employee Satisfaction Survey Respondents

Work Unit	Number of Employess
Human Resource	2
Finance	3
Subscription Relation	14
Asset and Equipment	4
Secretariat and Data Processing	14
Transmission and Distribution	8
Planning and Monitoring	5
Production	9
Total	59

In this research, questionnaires were distributed using closed answers, which meant that the respondents only had to choose the answers provided. The questionnaire is provided with a choice of attitude scale, which is a Likert scale. For customer satisfaction research, 2 questionnaires are provided, the customer perception questionnaire and the customer expectations questionnaire. Each customer questionnaire also contains the respondent's identity; the respondent's name, gender, age and address. In this customer satisfaction study, the indicators used are indicators that have been validated based on research conducted by Putra (2011), which is in accordance with the services studied, namely water company services. The indicators include:

Table 6. Indicators on the Customer Satisfaction Research Aspect of Intan Banjar Water Company

Number	Questions
	Tangible
1	Easy of visiting of Intan Banjar Water Company office (using private or public vehicles)
2	Payment method/system by Intan Banjar Water Company
3	Work equipment and supporting working equipment owned by Intan Banjar Water Company
4	Provision of complaint services from Intan Banjar Water Company
5	Condition of supporting service facilities owned by Intan Banjar Water Company (clean and comfort of the waiting room, parking space at the service office)
	Reliability
6	Continuity level of water flow distributed by Intan Banjar Water Company
7	Water quality produced by Intan Banjar Water Company (in accordance with quality standards)
8	Price of water
9	Accuracy in recording and calculating water use payments made by employees of Intan Banjar Water Company
10	Accuracy of information given to consumers
	Responsiveness
11	Company's response of Intan Banjar Water Company when there are unsatisfied complaints from customer
12	The speed of Intan Banjar Water Company's action on coping complaints submitted by customers
13	Attitudes & responses of Intan Banjar Water Company officials to customers who submit suggestions relating to service improvement
14	The polite attitude of the service officer of Intan Banjar Water Company
15	Capability of Intan Banjar Water Company officers when completing their work in accordance with consumer complaints
	Assurance
16	The skill of company employees of Intan Banjar Water Company in carrying out service duties to their customers
17	Assurance of safeness and hygiene of clean water treatment facility distributed to consumer
18	Punctuality in providing services provided by Intan Banjar Water Company
19	Security of failure's absence in providing services caused loss to customers
20	The sense of security of the customers toward the services provided by the friendly attitude of Intan Banjar Water Company employees as service providers
	Empathy
21	Level of ease access in reporting complaints to Intan Banjar Water Company
22	Way of communications of Intan Banjar Water Company's employees to the consumer in carrying out services
23	Easy to obtain information of product and services of Intan Banjar Water Company
24	Concern of Intan Banjar Water Company in serving its customers personally
25	Intan Banjar Water Company's efforts to avoid service delays

From these variables each question is given a score of 1 to 5. A score of 1 illustrates that the respondent is very dissatisfied, 2 is dissatisfied, 3 is neutral, 4 illustrates the respondent satisfied, while a score of 5 illustrates that the respondent is very satisfied. After the data has been collected, the data is processed, and a total score of service perception and expectations will be made.

In employee job satisfaction research, 1 satisfaction questionnaire is provided, the answer is also closed and uses a Likert scale. Questions refer to commonly used questions which are Minnesota questions that have been validated in Putra's research (2011). Each employee questionnaire contains the respondent's identity, namely name, gender, age, work division, last education and years of service.

Table 7. Indicators on Research Aspects of Employee Job Satisfaction of Intan Banjar Water Company

Number	Questions
1	Current work can guarantee future lives
2	Conformity of work with conscience
3	Rewards received are related to workload
4	Management of the company in providing opportunities for growth
5	Opportunity to be an important part of a team / division of work
6	Opportunity to use your own way to get the job done
7	Ways leaders handle subordinates
8	The ability of direct supervisors to make decisions
9	Rewards / sanctions for completing work well / poorly
10	Feelings of satisfaction obtained in completing work
11	The pattern of company management provides flexibility in utilizing work time
12	Freedom to work in completing work
13	Application of company policy in daily activities
14	Opportunity to use their abilities
15	Working conditions concerning current comfort / work facilities
16	Opportunity to help complete the work of co-workers
17	Communication relationships with customers as companies in the service sector
18	Harmonious work relationships among peers

The method in measuring the level of overall customer satisfaction that is commonly done is the Customer Satisfaction Index (CSI) method. The measurement stages are as follows [4]

Determine the Mean Importance Score and Mean Satisfaction Score.

This value is obtained from the average level of importance and performance of each respondent.

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

$$MSS = \frac{\sum_{i=1}^n X_i}{n} \quad (2)$$

Calculating Weighting Factors. This value is the percentage of the mean importance score per attribute of the total mean importance score of all attributes

$$WF = \frac{MIS_i}{\sum_{i=1}^p MIS_i} \times 100\% \quad (3)$$

Calculating weighted Score. This value is the multiplication weight between weight factors and the average level of satisfaction

$$WS = WF \times MS \quad (4)$$

Calculate the Customer Satisfaction Index from the total weighted score obtained.

$$CSI = \frac{\sum_{i=1}^p WS_i}{HS} \times 100\% \quad (5)$$

In the Importance Performance Matrix the X axis contains the value of performance (satisfaction) and the Y axis contains the importance value. Priority for service improvements can be read from the matrix created. The formula is as follows:

$$X = \frac{\sum_{i=1}^N X_i}{k} \quad (6)$$

$$Y = \frac{\sum_{i=1}^N Y_i}{k} \quad (7)$$

where:

X_i = level of satisfaction (perception)

Y_i = level of importance (expectations)

X = the average number of results weighted by the level of satisfaction

Y = average number of weighted results

k = number of respondents

III. RESULT & DISCUSSION

3.1 Characteristics of Research Respondents Level of Customer Satisfaction Intan Banjar Water Company
The following is the composition of respondents based on gender and age of respondents:

Table 8. Composition of Customer Respondents by Gender

Gender	Frequency	Persentase (%)
Male	66	66.00
Female	34	34.00
Total	100	100

Table 9. Composition of Customer Respondents by Age

Age (years)	Frequency	Persentase (%)
20-30	43	43.00
31-40	27	27.00
41-50	12	12.00
> 50	18	18.00
Total	100	100

From Table 8 it can be seen that the majority of customer respondents in this study were men with a percentage of 66% and for women only 34% of the total respondents. Then in this study respondents were dominated by young and productive customers, namely age 20-30 years by 43%, followed by productive ages 31-40 years by 27% which can be seen in Table 9. And only by 18% of respondents aged over 50 year.

Characteristics of Research Respondents Level of Job Satisfaction Employees of Intan Banjar Water Company
The following is the composition of respondents based on gender, age, last education and working period:

Table 10. Composition of Employee Respondents by Gender

Gender	Frequency	Persentase (%)
Male	41	69.49
Female	18	30.51
Total	59	100

Table 11. Composition of Employee Respondents by Age

Age (years)	Frequency	Persentase (%)
20-30	22	37.29
31-40	19	32.20
41-50	12	20.34

> 50	6	10.17
Total	59	100

Table 12. Composition of Employee Respondents by Education Level

Education Level	Frequency	Percentage (%)
High school degree	15	25.42
Diploma 3 degree	3	5.08
Bachelor degree	37	62.71
Master degree	4	6.78
Total	59	100

Respondents of Intan Banjar Water Company employees are dominated by men with 69.49% of the total respondents. Then, in Table 11 most of the employees are of the productive age range of 20-30 years by 22% and there are respondents with the smallest percentage of 6% ie employees who are going to retirement or more than 50 years. For the composition of respondents employees of Intan Banjar Water Company based on education level, most of them are employees with the last education level of bachelor degree, as many as 62.71% can be seen in Table 12.

Table 13. Composition of Employee Respondents Based on Working Period

Working Perode (year)	Frequency	Percentage (%)
<1	1	1.69
1-10	26	44.07
11-20	19	32.20
21-30	11	18.64
>30	2	3.39
Total	59	100

In the composition of respondents of Intan Banjar Water Company employees, the majority of respondents were employees who had worked for 1-10 years at 44.07%. This is in line with respondents based on age that the majority of employees are in the age range of 20-30 years or are employees who have not worked long enough. Whereas for very senior employees who have worked for more than 30 years only 3.39% which can be seen in Table 13.

Level of Customer Satisfaction Intan Banjar Water Company

Following is the calculation of the customer satisfaction index to calculate the level of customer satisfaction.

Table 14. Calculation of the Customer Satisfaction Index

Question Number	Expectation Average	Perseption Average	Weighting Factors	Weighted Score
1	3.74	3.53	0.038	0.133
2	3.95	3.62	0.040	0.144
3	3.74	3.54	0.038	0.134
4	3.95	3.42	0.040	0.136
5	3.94	3.54	0.040	0.141
6	4.19	3.46	0.042	0.146
7	4.30	3.54	0.043	0.154
8	4.03	3.34	0.041	0.136
9	3.97	3.48	0.040	0.139
10	3.89	3.40	0.039	0.134
11	3.81	3.39	0.038	0.130
12	4.00	3.41	0.040	0.138

13	4.01	3.44	0.040	0.139
14	4.01	3.53	0.040	0.143
15	4.03	3.52	0.041	0.143
16	3.99	3.41	0.040	0.137
17	4.15	3.43	0.042	0.144
18	3.96	3.39	0.040	0.136
19	3.94	3.35	0.040	0.133
20	4.00	3.47	0.040	0.140
21	3.87	3.41	0.039	0.133
22	3.92	3.54	0.040	0.140
23	3.95	3.47	0.040	0.138
24	3.82	3.39	0.039	0.131
25	3.88	3.41	0.039	0.134
Total	99.04			3.4573
Customer Satisfaction Index			69.15	%

Obtained a value of 69.15% from the calculation of equation (5). The results of the CSI value interpretation referring to Table 3 can be concluded that the level of customer satisfaction of Intan Banjar Water Company is included in the Satisfaction category. The value of customer satisfaction obtained is only 69.15%, it is necessary to improve service attributes so that the service quality of Intan Banjar Water Company is better and more optimal. Related to this, it will then be analyzed using the Importance Performance Analysis method to obtain priority recommendations for service improvement.

Level of Job Satisfaction Employees of Intan Banjar Water Company

The level of employee job satisfaction illustrates the level of employee satisfaction on aspects that can affect job satisfaction of Intan Banjar Water Company's employees. Research data are presented as a percentage on each satisfaction scale.

Table 15. Level of Employee Satisfaction at Intan Banjar Water Company

Question Number	Percentage (%)				
	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
1	0	3.39	18.64	69.49	8.47
2	0	1.69	6.78	86.44	5.08
3	0	3.39	20.34	67.80	8.47
4	0	15.25	33.90	38.98	11.86
5	0	5.08	27.12	64.41	3.39
6	0	0	25.42	72.88	1.69
7	1.69	8.47	23.73	61.02	5.08
8	1.69	11.86	16.95	64.41	5.08
9	3.39	8.47	30.51	55.93	1.69
10	0	3.39	23.73	66.10	6.78
11	0	1.69	27.12	67.80	3.39
12	0	1.69	6.78	86.44	5.08
13	0	3.39	22.03	71.19	3.39
14	0	1.69	28.81	57.63	11.86
15	0	3.39	18.64	67.80	10.17
16	0	0	23.73	69.49	6.78
17	0	0	15.25	72.88	11.86
18	0	1.69	16.95	74.58	6.78

From Table 15 it can be seen that although dissatisfaction is still found with a very small percentage on the indicators of the way leaders deal with their subordinates, the ability of direct superiors to make decisions, to the extent of rewards or sanctions when completing work well or poorly, but it can be seen that the majority opinion employees are on a Satisfaction scale Satisfied on all indicators of employee job satisfaction studied. Can be seen from the highest

percentages on each indicator. This is in line with Fatihudin (2019) which states that the satisfaction of company employees is directly proportional to the level of customer or consumer satisfaction, which results from this study are also on the Satisfaction scale.

3.5 Recommendations for Improving Service Quality of Intan Banjar Water Company

In this study the Importance Performance Analysis method provides recommendations or proposals for improving the service quality of Intan Banjar Water Company into 4 priority quadrants. As the values to be plotted into the Cartesian diagram, the average values of perception (X) and expectations (Y) are presented in the following table.

Table 16. Average Perception Value and Customer Satisfaction Expectations

Question Number	ΣX	ΣY	average X	average Y
1	353	374	3.530	3.740
2	362	395	3.620	3.950
3	354	374	3.540	3.740
4	342	395	3.420	3.950
5	354	394	3.540	3.940
6	346	419	3.460	4.190
7	354	430	3.540	4.300
8	334	403	3.340	4.030
9	348	397	3.480	3.970
10	340	389	3.400	3.890
11	339	381	3.390	3.810
12	341	400	3.410	4.000
13	344	401	3.440	4.010
14	353	401	3.530	4.010
15	352	403	3.520	4.030
16	341	399	3.410	3.990
17	343	415	3.430	4.150
18	339	396	3.390	3.960
19	335	394	3.350	3.940
20	347	400	3.470	4.000
21	341	387	3.410	3.870
22	354	392	3.540	3.920
23	347	395	3.470	3.950
24	339	382	3.390	3.820
25	341	388	3.410	3.880
average			3.457	3.962

After obtaining a mean number for each question indicator in each aspect of service, the value (average X, average Y) is plotted into the Cartesian diagram in Figure 1. The X axis cut line is at 3.457 and the Y axis cut line is 3.962. The following results are plotting in each quadrant.

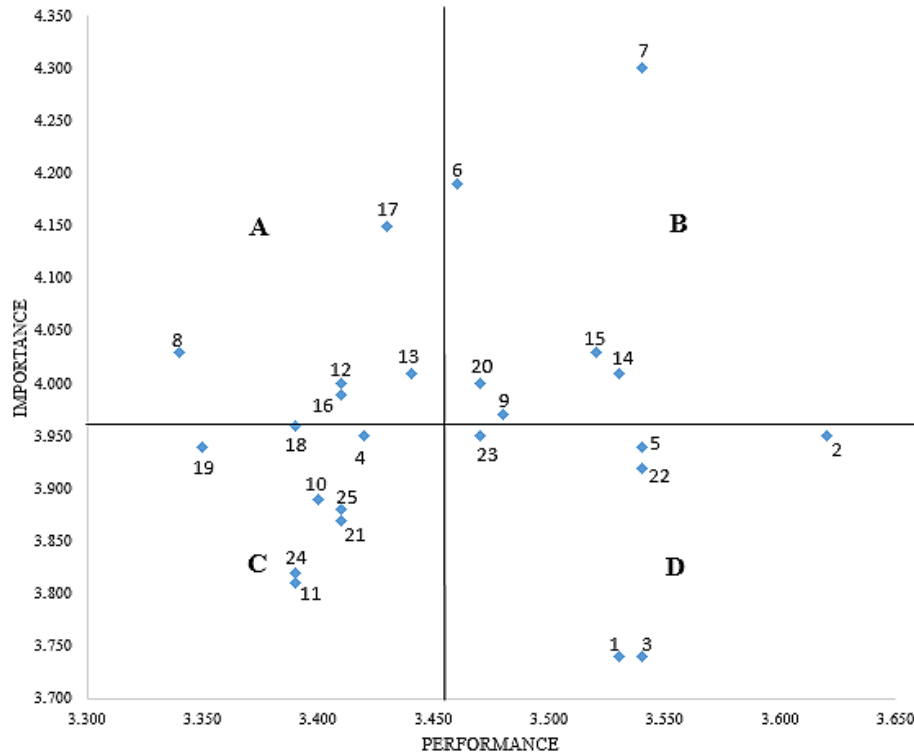


Figure 1. Importance Performance Matrix of Intan Banjar Water Company's Customer Satisfaction Level

The following results are readings in Quadrant A. In this quadrant contains service indicators that can be considered as indicators with high priority to be improved because their status of interest is high but their satisfaction is less or less good in their implementation, namely:

Price for water.

The customer expects that the tariff charged on the use of clean water will still be lower than what has been set. This is because the majority of customers are in the age range of 20-30 years which are new customers who have new income / jobs. In addition, late payments above the 20th of each month are subject to additional payments (fines) by Intan Banjar Water Company, for some customers this can be burdensome for customers.

The speed of Intan Banjar Water Company's action on coping complaints submitted by customers.

When viewed from employee job satisfaction, found employees who still feel very dissatisfied (3.39%) and dissatisfied (11.86%) of the motivation to reward in completing a job. This has an impact on employee performance. According to Prabu (2016), awards have a positive and significant effect on the performance of employees of a company. The high level of continuous appreciation of employees will have an impact on the increasing performance of employees at the company in this case taking action against customer complaints, and vice versa. For this reason, Intan Banjar Water Company needs to appreciate the work of its employees more.

Attitudes and responses of Intan Banjar Water Company officials to customers who offer suggestions relating to improving company services.

This can be related to the findings that there are still employees of Intan Banjar Water Company who are dissatisfied (8.47%) to very dissatisfied (1.69%) of the way / attitude of leaders in handling subordinates. Meanwhile, according to Prasetyo (2010) the attitude shown by a leader to subordinates will be an example / guideline and subordinates will emulate their superiors / leaders. So in this case, the leader must improve his attitude to employees so that employees / officers also improve their attitude in responding to suggestions submitted by customers.

The skills of Intan Banjar Water Company officers in carrying out service tasks to customers.

This can be due to the still dissatisfaction of 15.25% on the indicators of job satisfaction regarding company management in providing opportunities for growth. That means employees feel that the company is still lacking in supporting the improvement of their ability to work. So in this case Intan Banjar Water Company is deemed necessary to conduct or increase training for its employees.

Assurance of safeness and hygiene of clean water treatment facility distributed to consumer.
Customers expect hygiene assurance because it will greatly affect the customer's health.

IV. CONCLUSION

The conclusions that can be drawn from this study are:

1. The level of customer satisfaction of Intan Banjar Water Company is at the Satisfied level of 69.15%.
2. The level of job satisfaction of employees of Intan Banjar Water Company is at the Satisfied level.
3. Recommendations to improve the service aspects of Intan Banjar Water Company based on the Importance Performance Analysis on service indicators considered high priority to be improved: the price for water; the speed of Intan Banjar Water Company's action on coping complaints submitted by customers; attitudes and Intan Banjar Water Company officials' responses to customers who expressed their suggestions; the ability of Intan Banjar Water Company officials in carrying out their service duties and assurance of safeness and hygiene of clean water treatment facility distributed to consumer.

REFERENCES

1. Akbar, T. (2013) *Evaluasi Kinerja Sistem Distribusi Air Pada PDAM Tirta Pakuan di Perumahan Griya Melati Bogor, Jawa Barat*. Institut Pertanian Bogor.
2. Amanda, T. (2018) *Analisis Tingkat Kepuasan Konsumen Restoran Waroeng Hotplate Odon Cibanteng, Bogor, Jawa Barat*. *Forum Agribisnis* 8(1): 81–96.
3. Destria, S., H. S. Rukmi & S. Susanti. (2014). *Usulan Perbaikan Kualitas Pelayanan Minimarket Intimart dengan Menggunakan Metode Importance Performance Matrix*.
4. Devani, V. & R. A. Rizko (2016) *Metode Customer Satisfaction Index (CSI) dan Potential Gain in Customer Value (PGCV)*. *Jurnal Rekayasa dan Manajemen Sistem Informasi* 2(2): 24–29.
5. Djati, S. P. (2005). *Pengaruh Kinerja Karyawan Terhadap Kepuasan, Kepercayaan, dan Kesetiaan Pelanggan*. *Jurnal Manajemen dan Kewirausahaan* 7: 48–59.
6. Fatihudin, D. (2019) *Pemasaran Jasa (Strategi, Mengukur Kepuasan dan Loyalitas Pelanggan)*. Sleman: Penerbit Deepublish.
7. Kotler, P. (2009) *Manajemen Pemasaran*. Jilid 1. Edisi 13. Penerbit Erlangga.
8. Nurfarida, I. N. (2015) *Pengukuran Indeks Kepuasan Pelanggan untuk Peningkatan Kualitas Layanan*. 135–46.
9. Prabu, A. S. & D. T. Wijayanti. (2016) *Pengaruh Penghargaan dan Motivasi Terhadap Kinerja Karyawan (Studi Pada Divisi Penjualan PT. United Motors Center Suzuki Ahmad Yani, Surabaya)*. *Jurnal Ekonomi Bisnis dan Kewirausahaan* 5(2): 104.
10. Prasetyo, S. Y. (2010) *Peran Kepemimpinan Dalam Meningkatkan Motivasi Kerja Pegawai Pada Dinas Kelautan dan Perikanan Provinsi Jawa Tengah*. Universitas Negeri Semarang.
11. Putra, C. G. D. (2011) *Analisis Kepuasan Pelanggan Pada Perusahaan Daerah Air Minum (PDAM) di Kabupaten Jember*. Universitas Udayana.
12. Sofia, E. & R. Riduan. (2017) *Evaluasi dan Analisis Pola Sebaran Sisa Klor Bebas Pada Jaringan Distribusi IPA Sungai Lulut PDAM Bandarmasih*. 3(2): 10–24.
13. Sumarwoto, O. (1926) *Ekologi, Lingkungan Hidup dan Pembangunan*. Jakarta: Djambatan.
14. *Tribun Banjar News* (2018) *Tanggapan PDAM Intan Banjar Terkait Keluhan Pelanggan Lantaran Distribusi Tak Lancar*.