



Analysis of Service Levels in Café Black and White using Fuzzy Service Quality

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Article Info

Article history:

Received Okt 20, 2020

Revised Nov 24, 2020

Accepted Des 31, 2020

Keywords:

Fuzzy logic,
fuzzy-servqual,
Gap,
service quality.

ABSTRACT

This study is an analysis of the level of service in a Hitam putih café using fuzzy service quality. Hitam Putih café is a business that is engaged in the culinary field and also a coffee shop. At this time there is no system that can measure the level of visitor or consumer satisfaction with the services received and the services expected. Every consumer certainly wants to get good and optimal service. Therefore, it is necessary to measure to determine whether or not visitors are satisfied with the services provided by the hitam putih cafe. In this study, the method used to measure the level of service is the fuzzy service quality method, which is to determine the results of the gap between perceived and expected services. The system design was made web-based with the PHP programming language and the database used was XAMPP. Based on the resulting system design, it can be seen the level of service in the hitam putih café using fuzzy service quality so that visitors can find out the level of service in accordance with the service received and the service expected.

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1. INTRODUCTION

One of the newly established cafes that provides new innovations is the black and white Café which has black and white nuances that are shown through the interior colors. The black and white café is a café that has just been operating, so there has never been a measurement of visitor satisfaction. The services provided are the ease of getting services, information about the menu, availability of seats and safety while in the café. At the black café, there are complaints or complaints from several consumer customers, including lack of employee friendliness, waiting for orders too long, food menu stocks are often not available and limited seating availability. So that the dissatisfaction of this visitor must be resolved and corrected for the betterment of the black and white café in the future. If this is left unchecked, visitors will worry about moving to other competing cafes in the city of Medan. So far, the black and white café has not measured visitor satisfaction, so we do not know the level of visitor satisfaction with the quality of services that have been performed. Therefore we need a method that can solve problems in black and white cafes in analyzing the level of visitor service.

The application of Fuzzy Logic is one of the right ways to map an input space in an output space and to have a continuous value[1]. Logic using the concept of obscurity with many truths expressed in real numbers in the range [0,1][2], [3]. In Fuzzy Logic decision making is done by using an inference system called the fuzzy inference system, which is a process of making conclusions

based on Fuzzy Logic reasoning. Fuzzy Inference System can be done using several methods, namely the Mamdani method, Tsukamoto method, Sugeno method and Fuzzy Serviquial (Service Quality) method[4]–[6].

In the Fuzzy Service Quality Method works by comparing perceptions and expectations. this method is the most appropriate to solve the problem[7]–[9]. In full, Fuzzy service quality measures five gaps (gaps), but the point of emphasis and attention is the gap between perceptions and expectations. Fuzzy serviquial uses a Likert scale which has a range of values between 1 and 5 to express the level of perception and expectations of visitors / customers because the value range used by Fuzzy is able to connect a person's estimate with the processed data[10], [11].

In a study conducted by Hesti Solikah et al. 2017, the application of the fuzzy service quality method in analyzing the level of Travel Customer Satisfaction Using the Fuzzy Service Quality Method shows that the application of fuzzy service quality can determine the customer satisfaction index (IKP) of 83.76% of customers are satisfied with the services provided by Travel Satria Trans Malang City. Whereas in the research conducted by Ali Ikhwan et al 2019 the application of the fuzzy mamdani method in analyzing the level of customer satisfaction at Busrain Bakery using the mamdani method that the application of the mamdani method can determine the customer satisfaction index (IKP) of 62.53% with good enough service quality and quite satisfied customers. with the taste of food provided by the Busrain Bakery Shop. From the research that has been conducted by previous researchers, the application of the fuzzy service quality method is more efficient by approaching a value of almost 100%.

2. RESEARCH METHOD

The research framework is a collection of concepts arranged systematically in solving problems so that the research objectives are good.

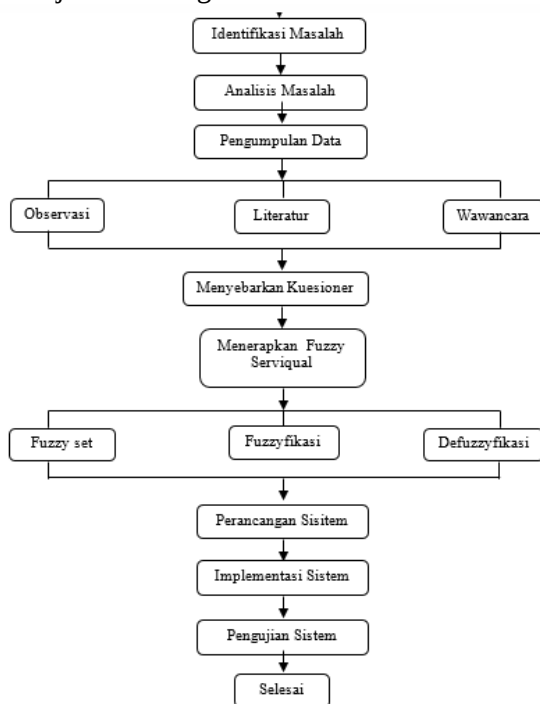


Figure 1. Research framework

Based on the stages of the research framework in Figure 1 above, the explanation of each stage is as follows:

a. Problem Identification

At this stage, learning about the introduction of problems found in the Black and White Café includes various service problems faced by visitors such as not getting a seat or not prioritizing first-time visitors, and the absence of an application used to measure the level of service quality.

Therefore, Café Hitam Putih needs a system that is able to determine the level of assessment patterns.

b. Problem Analysis

At this stage it needs to be done because the authors observed the research that, in analyzing the level of service at Café Hitam Putih so far, they have never measured the level of visitor satisfaction so that in improving the quality of service and in overcoming complaints from visitors it has not been implemented properly. So we need a system to analyze the level of service at Café Hitam Putih.

c. Data collection

At this stage it is an activity to find or collect data to obtain information needed in order to achieve research objectives such as:

a. Observation

Observation is the activity of a process or object by observing directly to obtain clear information. The purpose of observation is to describe the activities that occur and the people involved in them. With this observation method, researchers use to collect data directly, while the data collected is the level of visitors' assessment of café services by filling out a questionnaire at Café Hitam Putih on Jl. Pasar Baru no.54 Medan.

b. Literature

Literature is the process of finding references that match the problem. In this case, the source of the literature used is obtained from books, such as the notion of Fuzzy Logic and the stages of the Fuzzy Service Quality Method, Journals (National and International) containing previous research on the Fuzzy Service Quality method, as well as other references related to research.

c. Interview

Is an oral communication process that aims to gather certain information in a structured way and carried out by two or more people. The purpose of the interview is to obtain information and expand the data obtained from other parties such as cafe owners and employees where the interviewer provides questions to be answered by the party. the interviewee. The results of the interview will be used as a reference for the further research process. The interview process carried out is as follows:

Make a schedule for the parties involved, including the supervisors and employees of Café Hitam Putih.

Make questions both strategic and technical in nature to find out user needs for the application.

Set up a notebook or voice recorder.

Ask the Café about approval to distribute questionnaires to the Café's visitors

Record and summarize all the results that have been obtained

Distributing questionnaires

d. At this stage the authors collected the data needed for their research needs, including by distributing questionnaires to the visitors of Café Hitam Putih.

3. RESULTS AND DISCUSSION

3.1. Application of Fuzzy Service Quality (Servqual)

The stages of the data grouping process that can be carried out in the fuzzy service quality method by inputting the data processing are then processed in the formation of the fuzzy set to produce the selected combination. The stages of the fuzzy serviqual method are as follows:

Table 1. Variable Test

No Ques	Dimensi serviqual	Variabel pernyataan
Q1	<i>Reability / kehandalan</i>	Tempat duduk yang tersedia
Q2		Fasilitas pendukung cukup menunjang (musik, wifi)
Q3		Kecepatan makanan yang dipesan
Q4		ketepatan makanan yang dipesan
Q5		Kemudahan dalam memperoleh pelayanan

Q6		Kesesuaian harga dengan kualitas makanan
Q7		dijangkau Karyawan memberikan pelayanan sesuai dengan yang dijanjikan
Q8		Kebersihan makanan dan minuman
Q9		Kasir memberikan struk pembelian secara akurat
Q10		kelezatan makanan dan minuman
Q11		Karyawan menyampaikan informasi tentang promo, diskon dan pembayaran secara jelas
Q12		Pengunjung menerima pelayanan yang tepat dari karyawan
Q13	<i>Responsiveness / tanggapan</i>	Sikap ramah karyawan terhadap pengunjung
Q14		Ketika pengunjung membutuhkan sesuatu , karyawan memiliki waktu luang untuk membantu
Q15		Karyawan menanggapi keluhan pengunjung dengan segera
Q16		informasi mengenai menu yang disajikan
Q17		Kebersihan dalam ruangan café
Q18	<i>Tangible / bentuk fisik</i>	ketepatan peralatan tata letak yang menarik
Q19		Kerapian penampilan karyawan
Q20		Keindahan pada interior café ini
Q21		Perasaan aman ketika berada didalam café ini
Q22		Jaminan keamanan yang diberikan café ini
Q23	<i>Assurance/ Jaminan</i>	kenyamanan suasana didalam café ini
Q24		keamanan kendaraan yang diparkir
Q25		Perhatian kepada setiap kebutuhan pengunjung
Q26	<i>Empathy / Perhatian</i>	Memberikan pelayanan yang sama kepada pengunjung

In table 2 below, is the result of the recapitulation of the perception score. And the data is taken from 26 questions and 100 respondents as follows:

a. Results of Expectation Score Recapitulation

Table 2. Results of Perception Recapitulation

Pertanyaan	STP	TP	CP	P	SP	Jumlah
	1	2	3	4	5	
Q1	8	39	32	17	4	100
Q2	6	12	38	30	14	100
Q3	28	31	32	7	0	100
Q4	0	10	53	19	18	100
Q5	10	52	26	10	2	100
Q6	0	0	24	38	62	100
Q7	0	0	0	38	62	100
Q8	0	18	53	22	7	100
Q9	0	6	38	38	18	100
Q10	4	8	58	28	2	100
Q11	0	0	47	40	13	100
Q12	0	41	45	8	6	100
Q13	3	12	41	44	0	100
Q14	7	16	48	27	2	100
Q15	0	37	46	17	0	100
Q16	10	20	39	29	2	100
Q17	0	17	53	28	2	100
Q18	0	0	43	33	24	100
Q19	0	0	62	32	6	100
Q20	0	0	35	44	21	100
Q21	0	0	62	34	4	100
Q22	0	12	64	26	0	100
Q23	0	4	64	26	6	100
Q24	0	0	69	18	13	100
Q25	0	41	36	19	4	100
Q26	0	8	61	19	12	100

b. Results of Expectation Score Recapitulation

Table 3. Results of Expectation Recapitulation

Pertanyaan	STS	TS	KS	S	SS	Jumlah
	1	2	3	4	5	
Q1	0	0	0	5	95	100
Q2	0	0	0	0	100	100
Q3	0	0	0	0	100	100
Q4	0	0	0	0	100	100
Q5	0	0	0	0	100	100
Q6	0	0	0	0	100	100
Q7	0	0	0	0	100	100
Q8	0	0	0	0	100	100
Q9	0	0	0	0	100	100
Q10	0	0	0	0	100	100
Q11	0	0	0	0	100	100
Q12	0	0	0	0	100	100
Q13	0	0	0	0	100	100
Q14	0	0	0	4	96	100
Q15	0	0	0	11	89	100
Q16	0	0	0	17	83	100
Q17	0	0	0	17	83	100
Q18	0	0	0	16	84	100
Q19	0	0	0	7	93	100
Q20	0	0	0	7	93	100
Q21	0	0	0	9	91	100
Q22	0	0	0	5	95	100
Q23	0	0	0	0	100	100
Q24	0	0	0	0	100	100
Q25	0	0	0	0	100	100
Q26	0	0	0	40	60	100

3.2. Fuzzyfication

This composition process is used to obtain the composition value of the fuzzy number of all respondents using the arithmetic mean to obtain the average weight score. The following is a form of fuzzyfication calculation for the level of perception in the Q1 statement variable, namely:

Table 4. Perception Fuzzyfication Results

Kode	TFN		
Pernyataan	C	A	B
Q1	4,400	5,900	7,400
Q2	5,680	7,180	8,680
Q3	3,300	4,770	6,240
Q4	5,900	7,400	8,900
Q5	3,840	5,340	6,840
Q6	9,440	11,300	13,160
Q7	8,240	9,740	11,240
Q8	5,360	6,860	8,360
Q9	6,360	7,860	9,360
Q10	5,320	6,820	8,320
Q11	6,320	7,820	9,320
Q12	4,580	6,080	7,580
Q13	5,520	7,020	8,520
Q14	5,020	6,520	8,020
Q15	4,600	6,100	7,600
Q23	5,680	7,180	8,680
Q24	5,880	7,380	8,880
Q25	4,720	6,220	7,720
Q26	5,700	7,200	8,700

The calculation to find the Triangular Fuzzy Number (TFN) value. The expectations in the questions below are the same as the Perception (TFN) calculation. Following are the results of Perception Fuzzyfication.

Table 5. Expectation Fuzzyfication Results

No Pernyataan	TFN		
	C	A	B
Q1	8,900	10,400	11,9
Q2	9,000	10,500	12
Q3	9,000	10,500	12
Q4	9,000	10,500	12
Q5	9,000	10,500	12
Q6	9,000	10,500	12
Q7	9,000	10,500	12
Q8	9,000	10,500	12
Q9	9,000	10,500	12
Q10	9,000	10,500	12
Q11	9,000	10,500	12
Q12	9,000	10,500	12
Q13	9,000	10,500	12
Q14	8,920	10,420	11,92
Q15	8,780	10,280	11,78
Q16	8,660	10,160	11,66
Q17	8,660	10,160	11,66
Q18	8,680	10,180	11,68
Q19	8,860	10,360	11,86
Q20	8,860	10,360	11,86
Q21	8,820	10,320	11,82
Q22	8,900	10,400	11,9
Q23	9,000	10,500	12
Q24	9,000	10,500	12
Q25	9,000	10,500	12
Q26	5,820	6,810	7,8

Table 6. Results of Five Dimensional Servqual Gap Results

Dimensi Servqual	Persepsi	Harapan	Gap	Rank
<i>Reability / kehandalan</i>	8,127	11,240	-3,133	3
<i>Responsievers / tanggapan</i>	7,166	11,122	-3,956	5
<i>Tangible / bentuk fisik</i>	8,38	11,015	-2,635	2
<i>Asurance/ Jaminan</i>	7,955	11,18	-3,255	4
<i>Emphaty / Empati</i>	7,46	9,277	-1,817	1

After processing data on each dimension, from the table above it can be seen that all dimensions have negative values. The first place is the Emphaty dimension with a gap value of -1.817, then the second rank is Tangible with a gap value of -2.6. The third rank is reliability dimension with a gap value of -3,133. Ranking of the four assurance dimensions with a gap value of -3,255. The fifth rank is the Resvonsieves dimension with a gap value of -3,956. Based on the results of the research conducted, the conclusion is that the measurement of the five dimensions of service quality found all dimensions have negative values. Thus, what the café visitors expect is not in accordance with the reality received in the service. From the gap value per statement variable in the dimension of service quality, there are only two values that have positive values, namely the Q6 variable, namely the suitability of price with food quality and Q26 Providing the same service to visitors. From this it can be concluded that the other 24 variable statements have not reached the satisfaction level of visitors to the black and white café.

3.3. Implementation

Implementation is the stage of implementing a system to be built where the system or application is ready to operate with the results of the analysis and design carried out, whether the designed system can run well and produce the objectives achieved.

1. Visitor Login Form

The first page that will appear when this system is accessed is the "Login" page. The login page is the initial display when the website is run, in this login view, there is a visitor code, gender and occupation. The appearance of this login page can be seen in the following image.

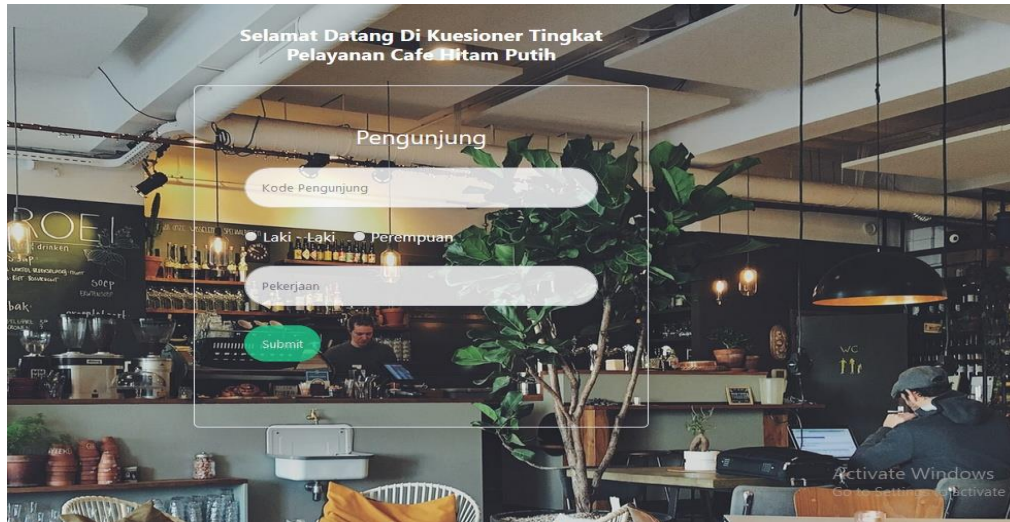


Figure 2. Display Visitor Login

2. Admin Login Form

The login form is the initial step that must be done in using the system. On this page, admin can log in by entering the correct username and password, then the user will then go directly to the main menu display. The login form displays are as follows:

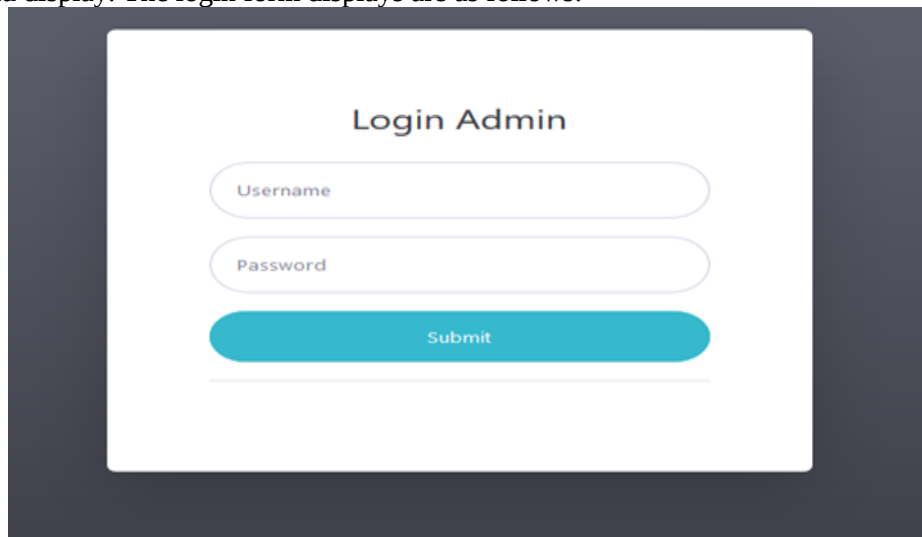


Figure 3. Display Admin Login

3. Results Report

This results report form is a result report that has been processed to determine the level of visitor satisfaction with services at Café Hitam Putih using the Fuzzy Servqual method. The appearance is as follows:



Figure 4. Results Report

4. Output Display (Output)

The output display is a display of the results of the Profie Matching process. On the output display page, we can see the output of the data that we input previously. Based on the results of the output and the existing graphs, we can see alternatives in service assessment.



Figure 5. Output Display

4. CONCLUSION

From the results of the research conducted by the author, the following conclusions were drawn. Based on the processing and analysis of fuzzy-servqual data per attribute, it can be seen that the level of service quality at Café Hitam Putih has two statement variable values in the dimension of service quality, there are only two values that have a positive value, variable Q6, namely Price suitability with food quality and Q26 same to visitors. From this it can be concluded that the other 24 variable statements have not reached the satisfaction level of visitors to the black and white café.

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