

Costumers' Satisfaction Analysis at Kartika Hotel International in East Java Using Fuzzy Servqual Approach

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Abstract: Kartika Hotel International is located in the city in East Java, the first hotel in the city gaining 4 stars and international level. The purpose of this study is to see the customer's satisfaction level in Kartika International Hotels in a city in East Java with the services provided by the hotel by using servqual fuzzy approach in which the respondent is 42 people/families who stayed at the hotel. Type of research is description research which means that the study is conducted to illustrate an event based on the observed data. In this study, the goal is to analyze the relationship of servqual based on 5 factors, among others, reliability, tangible, responsiveness, assurance and empathy. Sources of data collected consist of primary data and secondary data. Research was conducted from October to November, 2013. The result is poor service, viewable from the gap defuzzification point for all of the criteria are not positive, then the report recommends an increase in hotel services to its customers.

Key words: Kartika Hotel, costumer's satisfaction, fuzzy serqual, tangible, primary data

INTRODUCTION

In today's globalization era there are many changes on people's perception about problem. In line with the times and the increasing level of satisfaction of a need, people begin to establish certain rules in the fulfillment of their needs including in the most basic motivation according to Maslow, the rest (sleep). Consumers now-a-days become more selective to the products or services they bought. It is not just about the customers' satisfaction but also the guaranteed quality to fulfill their demand.

Companies are called to show their advantage in the competition and the ability to improve creatively and innovatively so the products or services they offer could be the number one choice for the new and old customer quoted by Hurriyati. Customers are important asset for companies. That is why quality in serving the customer must be prioritized in order to be the best. Continous improvement is a step to improve the products and services. Delivery process (customer valued) is evaluted continously in the most effective, efficient and flexible way. Consumer's need for a product or service must be adjusted to their criteria or past their requirements.

Service quality is one of the most expected trait and control over that advantage to fulfill customer's demand where quality of a service is the result of comparing between performance and what the customer received from the one who offer the service (Lovelock quoted by

Tjiptono and Chandra (2011). The Quality Management System (QMS) is a set of documented procedures and standard practices to ensure compliance of the management system of a process and product (goods or services) to the specific needs (Gaspersz, 2012). While, the dimensions of quality is fitness for use which mean that a product or service be in accordance with what is required or expected by the user (Juran, 1962). Customers are the key to the success of companies, it can be defined the understanding of customer satisfaction is the extend to which product perceived performance matches a buyer's expectation. If the product performance fall short of expectation, the buyer is dissatisfied. If performance matches or exceed expectation, the buyer is satisfied or delighted or it can be defined, as customer satisfaction is a post consumption evaluate judgement concerning a specific product or services (Mayhew and Gundersen, 1996).

Kartika Hotel International is located in the town in East Java, the first hotel in that town gaining 4 stars and internetonial level which since, 2006 have changed its managements and ownership. Since, then Kartika Hotel International rebuilds its image and adds facilities and infrastructure of hotels because it is supported by a strong, serious and cohesive management team. Kartika Hotel International is comparable to other cities that have international standards. The result is visible now, it is known as the hotel with vision and mission to always prioritize the service and costumers' satisfaction.

Research question:

- What are hotel visitors' expectations to the service quality/services by Kartika Hotel International, Tegal, Central Java?
- What are the visitors' perceptions to the service quality hotel/services by Kartika Hotel International, Tegal, Central Java?
- What is the level of gap fuzzy servqual between hotel's visitors perception and expectation to the service quality/services by Kartika Hotel International, Tegal, Central Java?
- What are factors that should be improved in service quality/services on Kartika Hotel International, Tegal and Central Java?

Literature study

Understanding quality: Quality is one of the keys in winning competition in the market. When a company is able to provide quality products, it has built one of the foundations of creating customer's satisfaction.

- According to Goetsh and Davis, quoted by Arief, quality is a dynamic condition that relates to product, services, humans, process and environment fulfill or exceed the expectations
- According to Crisby, quoted by Yamit, quality is a zero defect, completeness and suitability towards requirements
- According Kotler quality is the totality of features and characteristics of the products or services that depends on its ability to satisfy implied or stated needs. This is precisely the definition of customer-centered. Resarchers can say that the seller has delivered quality when products or services meet or exceed customer expectations. Companies are able to satisfy most of the needs of its customers all of the time called qualified companies

Based on these definitions, it can be concluded that quality is a basic condition relating to products, services, people, processes and environments in fulfilling the expectations of existing specifications that depend on the ability to generate customer satisfaction.

Understanding services:

- The understanding of services according Stanton in Buchari is something that can be separately identified intangible, in offering to meet the needs. Services can be generated through tangible or intangible object
- According to Kotler service is a form of product that consists of activities, benefits or satisfaction offered for sale, basically intangible and does not result in ownership of anything, e.g., hotels and airlines

- According Gronroos in Tjiptono and Chandra, services is process consisting of a set of intangible activities that usually occurs in the interaction between customer and employee services which are provided as solutions to customers' problems
- Based on the definition of services according to some experts, it can be concluded that service is a form of product that has activities in offering to meet the intangible needs

Definition of services: According to Lewis and Booms in Tjiptono and Chandra (2011) is a measure on how good the level of services provided according with the expectations of the customer. Based on this definition, the quality of service can be achieved by fulfilling the needs and desires of customers and delivery accuracy to balance customer's expectations. Thus, there are two main factors that affect the quality of services which is services that are expected (expected service) and services that feel/perceive (perceived service). According to Collier that quoted by Yamit, it conclude that the quality of service emphasize more on the customer, service, quality and level. Several understanding that relates to the definition of quality of a service:

- Excellent is an individual service performance standards that are gained
- Customer is an individual, group, department or company that receives, pays the service output
- Service is primary or complementary activities that are not directly involved in the production process but emphasis on service transactions between buyers and sellers
- Quality is something that specifically can be touched or not that depends on the adjective of a product or service
- Level is a statement upon the systems used to monitor and evaluate
- Consistent is not having variety and all service goes according to the established standards
- Delivery is to give the right services in the right way in the right time

It can be concluded that the quality of services/service is an offer that is given to customers who can meet the needs of customers as well as balancing with customer's expectations.

Service quality measurement: In measuring quality of service, there are several methods of measurement, such

as servqual (service quality), servperf (service performance) and customer windows. Third difference is:

Servqual (service quality): The method used to determine the quality criterias that must be improved is based on the gap between the perceptions and expectations of customers (Tjiptono and Chandra, 2011).

Servperf (service performance): Service quality measurement method by just measuring the performance of these services (Cronin and Taylor, 1992).

Customer windows: Service quality assessment techniques that can be used to see the level of consumer needs based on company performance.

Looking at Table 1, the servqual method shows more factors that support the measurement of service quality, therefore on this basis it is more appropriate if the above cases solved by the servqual method.

Servqual definiton: Servqual is a questionnaire used to measure service quality. This way was developed by Zeithaml, Parasuraman and Berry, quoted in the book Gaspersz and has been used to measure a variety of service quality. With this questionnaire, researchers can find out how big a gap that exists between customer's perceptions and expectations of customers of a service company. Servqual questionnaire can be adjusted to match the service industry who also different.

Servqual is a multi-item scale measurement model intended to measure expectations and perceptions received by customers and the gap that exists in the model of service quality. Servqual define evaluation of the quality of customers in the form of the gap between the level of expectations and perceptions accepted by costumer. Measurements can be conducted by Likert scale where respondents only have to choose the degree/disapproval of statements regarding the delivery of quality services (Tjiptono and Chandra, 2011).

Based on A. Parasuraman, Valarie A. Zeithaml dan leonard L. Berry's study entitled A conceptual model of

service quality and its implication for future research, quoted in Chandra has been described in detail 5 service quality gaps that could potentially be a source of service quality issues. Servqual model called (short for service quality) was developed to assist managers in analyzing and understanding the source of quality problems ways to improve the quality of services (Fig. 1).

Gap: Gap is known as a gap. In this case, the quality of services provided is affecting customer's satisfaction of a firm. However, there are some gaps that may lead to failure in the delivery of services to customers. According Tjiptono and Chandra (2011), the gaps that exist between other:

Gap 1 (knowledge gap): Gap between customer's expectations and management's perceptions. This gap means that management perceives customer's expectations on quality of service are in accurate. Some possible causes include information obtained from market research and demand analysis is less accurate, less accurate interpretation of information about customer expectations; the lack of analysis of demand and poor flow of information to upon customer contact staff to management.

Gap 2 (standards gap): Gap between management's perception towards consumer's expectations and service quality specifications. This gap means that the specification of the quality of a services is not consistent with management's perceptions of the quality expectations. The causes include the lack of clear standards of performance, poor planning and lack of a clear goal/vision of the organization.

Table 1: Differences in service quality measurement

Information	Servqual	Servperf	Customer windows
Performance		✓	✓
Customer's perception	✓	✓	✓
Customer's expection	✓		
Troubleshooting information	✓		
Gap analysis	✓		
High level of validity	✓		
Identification of cause		✓	✓
Suitability with the concept of dimension	✓		

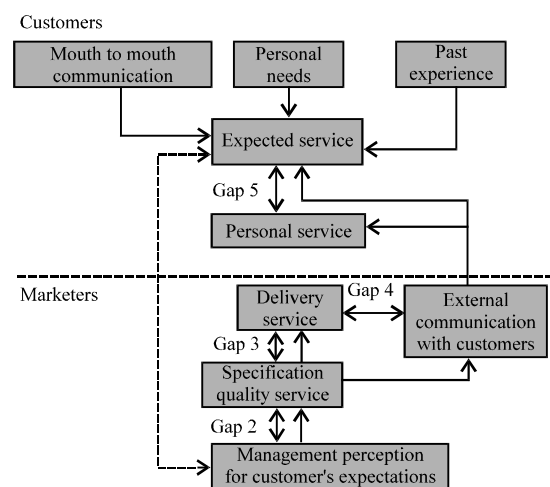


Fig. 1: Servqual conceptual model

$$c = \sqrt{c_1 * c_2 * c_3 * c_4 * c_5 * \dots * c_{40} * c_{41} * c_{42} *}$$

$$b = \sqrt{b_1 * b_2 * b_3 * b_4 * b_5 * \dots * b_{40} * b_{41} * b_{42} *}$$

$$a = \sqrt{a_1 * a_2 * a_3 * a_4 * a_5 * \dots * a_{40} * a_{41} * a_{42} *}$$

On this research will use center of area method (center of gravity) or often referred to as the centroid method. This method is the most common and most widely proposed by many researchers to be used in Kusumadewi and Purnomo. Mathematical formulation of this method can be given as follows:

$$COG = \frac{\int_c^a \frac{(x-c)}{(a-c)} .xdx + \int_a^b \frac{(x-b)}{(a-b)} .xdx}{\int_c^a \frac{(x-c)}{(a-c)} .xd + \int_a^b \frac{(x-b)}{(a-b)} .xd}$$

MATERIALS AND METHODS

Research design: This study uses fuzzy servqual. Servqual method is the method used to determine the quality criteria that must be improved quality of service based on the gap between the perceptions and expectations of customers. Servqual method itself consists of 2 parts, i.e., assessment and weighting. The study was conducted by distributing questionnaires in which one participant stated perceptions and expectations. Weighting is done by distributing questionnaires in which a participant gives a certain weight.

Method and reason on using this method: This research is quantitative and use fuzzy servqual method. Servqual method is the method used to determine the quality criteria that must be improved the quality of service based on the gap between the perceptions and expectations of customers. Servqual method itself consists of 2 parts which are assessment and weighting. The study was conducted by distributing questionnaires in which one participant stated perceptions and expectations. Weighting is done by distributing questionnaires in which a participant gives weight.

The type of data used in this research is quantitative data which means the data are in the form of numbers or qualitative data in the number figure. Quantitative research methods can be interpreted as a method of research that is based on the philosophy of positivism used to examine the population or specific samples.

Sampling technique used is the probability sampling with sampling techniques that provide equal opportunity

for every element (member) to be elected as members of a population sample. The technique used simple random sampling because taking members of the sample population conducted randomly regardless the existing rank in the population.

Research design: The research methods, according to its explanatory level, there are 3: Descriptive, comparative and associative. This study uses fuzzy servqual, the method used to determine the quality criteria that must be improved quality of care/services based on the gap between the perceptions and expectations of customers. Servqual method itself consists of 2 parts, namely; assessment and weighting. Assessment is done by distributing questionnaires in which participants expressed a perception and expectations. Weighting is done by distributing questionnaires in which a participant gives a certain weight (Table 2).

Explanation:

- T₁: Identifying and analyzing visitor's expectations of service quality hotel/hoetel management services at Kartika
- T₂: Identifying and analyzing visitor's perceptions of service quality hotel/hotel management services at Kartika
- T₃: Knowing how big is the gap between fuzzy servqual expectations with visitor perceptions of service quality hotel/hotel management services at Kartika
- T₄: Proposed improved quality of care/services at Kartika hotel management

Source of research data: Sources of data in this study use primary data collection sources and secondary sources. The data source in writing is an important factor to be considered in determining the metho of data collection (Table 3).

Table 2: Research design

Objectives	Types of research	Analysis unit	Time horizon
T ₁	Descriptive	Individual-consumer	Cross sectional
T ₂	Descriptive	Individual-consumer	Cross sectional
T ₃	Comparative	Individual-consumer	Cross sectional
T ₄	Problem solving	Company	Cross sectional

Table 3: Types and source of research data

Objective	Types of data	Source of data
T ₁	Quantitative data	Primary data (Questionnaire)
T ₂	Quantitative data	Primary data (Questionnaire)
T ₃	Quantitative data	Primary data (Questionnaire)
T ₄	Quantitative data	Primary data (Questionnaire)

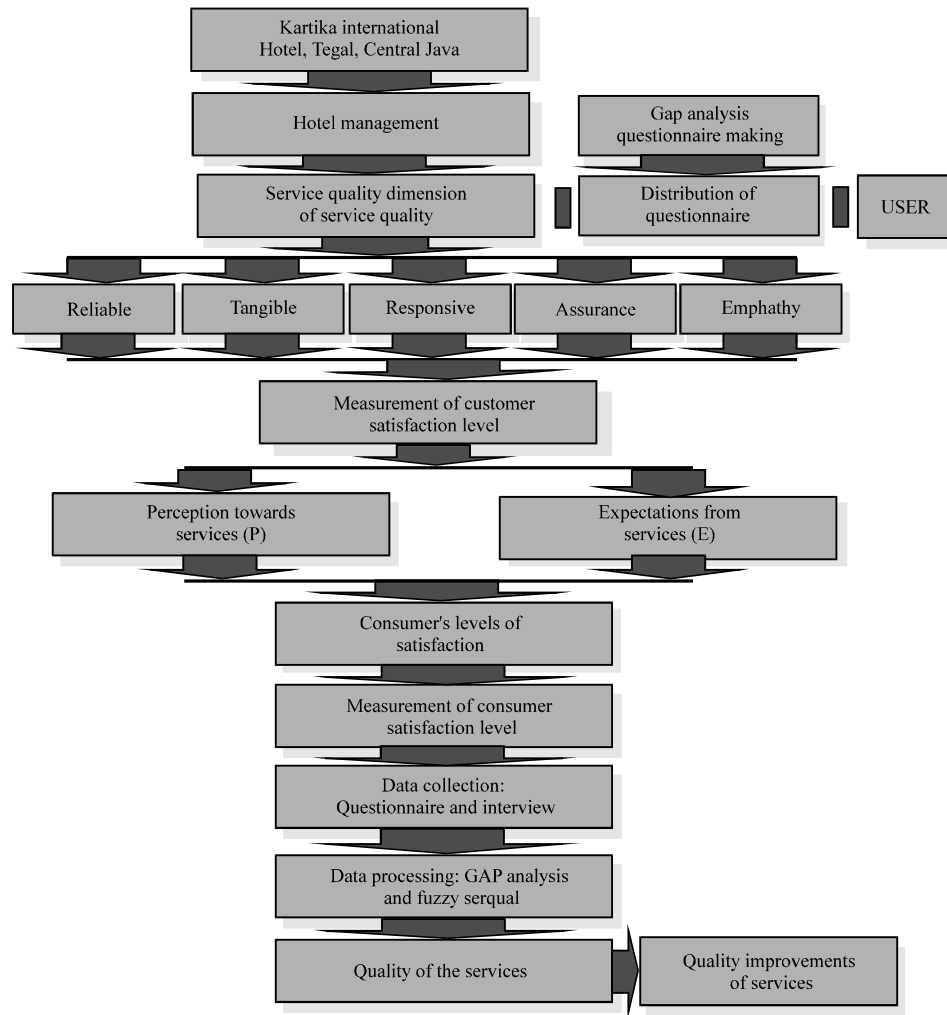


Fig. 3: Research framework

Operationalization of research variables: The definition of operational in this study explained that the service quality is determined as the independent variable (the independent variable). Variable services are services that are adjusted with the results of the answer from respondents by looking at the reliability (reliability), responsiveness (responsiveness), guarantee (assurance), empathy (empathy) and physical evidence (tangible) provided by the hotel management (Table 4).

The relationship between the variable researches indicates by the indicator variable of the study that is based on the theory of Zadeh, quoted in the book Kusumadewi.

Type of research that will use here is description research which means that the study is conducted to illustrate an event based on observed data. This research is used to analyze the relationship Servqual which is based on 5 factors, among others: Reliability, tangible, responsiveness, assurance and emphaty (Fig. 3).

Table 4: Variable operational research

Variables	Dimension	Indicator	Scale of measurement
Consumer's satisfaction	Tangible	Cleannes of bedroom	Likert
		Availability of physical facility	
	Reliable	Reliability support productivity	
		Ease of information	
	Responsive	Speed of service	
		Workplace safety	
	Assurance	Occupational health	
		Availability receiving feedback	
	Emphaty	Easy access	
		Convenience of work	
Servqual	Satisfaction	Quality of service	Fuzzy-fication
		Speedy response	
		Perception and reality	
Service quality	Fuzzy-fiction	Measurement of satisfaction by precision	Fuzzy-fication
		Improvement of service quality based on the value of GAP:	
		Services international hotel Kartika towards internal customers	
		Proposed improvements regarding aspects of services	Suggestion

RESULTS AND DISCUSSION

Integrating fuzzy servqual

Determination fuzzy set: To determine fuzzy set it need response score to each criteria proposed on questionnaire (Fig. 4).

Calculation fuzzyfication value percetion and expectation of guest costumer Kartika Hotel: In calculating the value of questionnaires fuzzyfication customer perceptions and expectations using software Ms. Excel, fuzzyfication value is the average value of c, a and b ranking is done from the highest to the lowest values (Table 5).

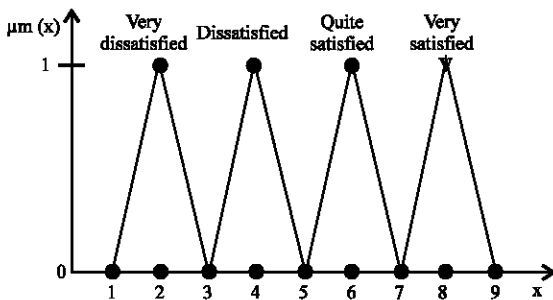


Fig. 4: Determination of fuzzy value set

Result analysis: The steps of data processing stage are described:

Stage linguistic variabel change to fuzzy number: The data have been obtained from the phase distribution in the form of questionnaires previously translated into linguistic variables fuzzy numbers. Where in the present study used a triangle membership function, so its fuzzy numbers are triangular fuzzy numbers.

From the results mentioned earliar and then transformed linguistic value of each respondent into three triangular fuzzy numbers according to the answers of each respondent. Example is the correspondent here to answer 2 means not important to the TFN (Triangular fuzzy number) $c = 3$, $a = 4$, $b = 5$.

Calculation mean geometric of questionnaire: After translating linguistic variable to TFN number fuzzy triangular comprising 12 questions in questionnaire, next step by combining each of the lower limit (c), the limit was (a) and the upper limit (b) of the 12 questionnaires to each of the lower limit value (c), the middle limit (a) and the upper limit (b) for each comparison, using the formula of the average, as follows (Table 6):

Example calculation: Question of perception criteria-1.

Table 5: Fuzzyfication value based on costumer perception and expectation

Criteria statement	Costumer perception			Costumer expectation		
	TFN			TFN		
	a	b	c	Deffuzification	Rank	Deffuzification Rank
The cleanness of hotel room that I spent a night in makes a comfort sensation when taking a rest	4.5243	5.6142	5.8772	5.3385	5	7
Main facilities in the hotel room like bed, phone, room lighting, reading lamp, TV, AC and refrigerator are appropriate to my requirements	4.289	5.2337	5.7789	5.1005	6	12
Supporting facilities like swimming pool, SPA, gym, parking lot are adequate	4.7622	5.6772	6.1442	5.5278	2	8
Informations from the hotel's management are fast and accurate	4.3442	5.3201	5.5622	5.0755	7	9
Management are quick and responsive in giving solutions	4.6412	5.7895	6.1967	5.5424	1	11
The placement of objects that potentially will put the customers in danger are very observed	3.7982	4.8952	5.2465	4.6466	11	3
The hotel's management is paying attention to pollution impact whether it's air (dust) or sound (noise) that will trouble customers' health	4.4921	4.6229	5.9761	5.0303	10	10
The hotel's management are willing to take any critics and suggestions	4.2776	5.7562	6.2445	5.4261	4	1
Ease of access (reach) between a hotel room with another room	3.2987	4.6773	5.4776	4.4845	12	2
Magnitude of the width of the alley between the inter-dimensional space in accordance with/ posture of the human body in general as it goes	4.4571	4.9336	5.7454	5.0453	8	6
Quality of service provided to customers of hotel management	3.9776	5.1634	5.9667	5.0359	9	5
Responses given in fulfilling hotel management is very responsive to customer complaints	4.7687	5.3913	6.4125	5.5241	3	4

$$c = \sqrt[42]{(3.7.7.3.5.3.5.5.3...5.7.3.5.3.5.633.7.5.3.3.5.7)}$$

$$c = 4.7992$$

$$a = \sqrt[42]{(4.4.4.4.6.8.6.4.6...6.4.6.4.6.6.4.4.6.6.8.6.6.8.4.6)}$$

$$a = 5.4837$$

$$b = \sqrt[42]{(5.7.7.5.9.5.7.5.7...7.5.7.9.5.5.7.7.7.9.7.7.7.7)}$$

$$b = 5924$$

Defuzzification: In the present, study used methods of Centre of Gravity (COG). Where the three values of triangular fuzzy numbers (c, a, b) has average geometrical would be converted into a crisp value for the later for processing using servqual. The formula of defuzzification are as follows: Example calculation:

$$COG = \frac{\int_c^a \frac{(x-c)}{(a-c)} \cdot x dx + \int_a^b \frac{(x-b)}{(a-b)} \cdot x dx}{\int_c^a \frac{(x-c)}{(a-c)} \cdot dx + \int_a^b \frac{(x-b)}{(a-b)} \cdot dx}$$

Table 6: Recap average geometric perception, questions hygiene, main facilities and supporting facilities

Criteria	Mean		
	c	a	b
Hygiene	4.7992	5.4837	6.5924
Main facilities	4.5814	5.7762	6.7292
Supporting facilities	4.3529	5.4661	6.2495

The earlier table only for the 3 questions of the 12 questions asked

Table 7: Gap value fuzzy fication per-criteria and its solution

Criteria	Gap value defuzzification	Information	Sugessted solutions
The cleanness of hotel room that I spent a night makes a comfort sensation when taking a rest	-1.0553	This condition arises because it is too close to the traditional markets that exist in front of the hotel	More frequent cleaning on each floor of in the room because it is impossible to move traditional markets form its locations
Main facilities in the hotel room like bed, phone room lighting, reading lamp, TV, AC and refrigerator are appropriate to my requirements	-1.2519	This condition arises because the hotel room did not reflect the standards standard hotels the of the area attached to the walls of the traditional nature room is still dominant	Further enhance the international standard facilities, according to international standards
Supporting facilities like swimming pool, SPA, gym, parking lot are adequate	-1.4819	This condition arises because: Swimming pools are allocated to the the public facilities (outside the hotel can swim home pay) SPA andsports facilities are simple and less complete has not reflected the standard of the international	Must limit the hotel as public facilities (guests are prohibited from restricting not swim) SPA facilities (although relatively new) and enhanced sports/rejuvenated/updated
Informations from the hotel's management are fast and accurate	-2.7692	This condition arises because: Less number of employee-angle corner of the hotel room of Information on the hotel walls of hotel rooms still not enough	Increase qualified personnel Increase the information in every corner the hotel which customer will read
Management are quick and responsive in giving solutions	-2.7311	This condition arises because of a lack of communication between customers and hotels	The need for more frequent communication of all issues between the superior and subordinate, so that customer complaints will be accepted immediately superior
The placement of objects that potentially will put the customers in danger are very observed	-1.4592	The condition arises because it is electrical cables still visible to the eyes of customers	More smoothed-related electrical facilities

$$a = [(5,64 \wedge 3)/3] - [(4,617 * [5,64 \wedge 2])/2] = -13.629$$

$$c = [(4,617 \wedge 3)/3] - [(4,617 * [4,617 \wedge 2])/2] = -16.401$$

$$x1 = [(-13.629) - (-16.401)] / (5,64 - 4,617) = 2,71$$

$$b = [(6,655 \wedge 3)/3] - [(6,655 * [6,655 \wedge 2])/2] = -49.124$$

$$a = [(5,64 \wedge 3)/3] - [(6,655 * [5,64 \wedge 2])/2] = -46.043$$

$$x2 = [(-49.124) - (-46.043)] / (5,64 - 6,655) = 3,035$$

$$b = [(5,64 \wedge 2)/2] - (4,617 * 5,64) = -10,134$$

$$a = [(4,617 \wedge 2)/2] - (4,617 * 4,617) = -10,657$$

$$x3 = [(-10,134) - (-10,657)] / (5,64 - 4,617) = 0,511$$

$$b = [(6,655 \wedge 2)/2] - (6,655 * 6,655) = -22,145$$

$$a = [(5,64 \wedge 2)/2] - (6,655 * 5,64) = -21,629$$

$$x3 = [(-22,145) - (-21,629)] / (5,64 - 6,655) = 0,508$$

$$x = (2,71 + 3,035) / (0,511 + 0,508) = 5,637$$

Calculation value defuzzyfikasi customer preceptions and exception: The gap value of fuzzyfication shows in Table 7.

Table 7: Continue

Criteria	Gap value defuzzy fication	Information	Sugessted solutions
The hotel's management are paying impact whether it's air (dust) or sound (noise) that will trouble customers' health	-2.8763	This condition was because hotel to close to traditional markets	Trees planted in front of the hotel pollution many dense thereby limiting customer vision out of the hotel, also can reduce noise (although very small)
The hotel's management are willing to take any critics and suggestions	-2.7556	This condition arises because of the unavailability of a suggestion box to submit criticisms and suggestions	Put more suggestions and criticisms boxes
Ease of access (reach) between a hotel room with another room	-1.0044	This condition arises because the construction of the hotel done gradually (no delay time of >2 years) so that the construction of access is less perfect, than if the hotel directly built	Need to arrange the existing construction, so that the corners of the hotel that it is less necessary could be dismantled
Magnitude of the width of the alley between the inter-dimensional space in accordance with/posture of the human body in general as it goes	-1.4615	This condition arises because the hallway between the rooms are less spacious, thus disrupting	It is impossible to disassemble room hotel room, then the solution puts a lot of waiting rooms on each floor of the customer traffic when passing hotel
Quality of service provided to customers of hotel management superiors to subordinates	-1.0334	This condition arises out of a hotel employee responded to customer complaints	Need more frequent socializing the vision, mission and goals of the company by
Responses given in fulfilling hotel is very responsive to customer complaints	-1.2642	This condition arises because of the slow response of employee (especially the receptionist) with superior decision-makers	Need training/training/workshop management internship communication materials

CONCLUSION

Based on the analysis of research results obtained several conclusions, among others:

- The gap is negative that needs more follow-up by the hotel to improve the customers' satisfaction in future
- Hotel should always anticipate the development of world tourism often, so it can be any input that has developed around the world tourism
- The hotel should make changes to the traditional concept of being an international hotel to match the four-star hotel standard
- The hotel had to recruit new workers and experts for services provided to the maximum level
- The hotel should add to the existing facilities at the hotel, as well as perform regular maintenance for the comfort and satisfaction of consumers
- Put more suggestions and criticisms boxes to know customers perception

RECOMMENDATIONS

For the next research, it would be good if the number of samples is added with longer research time, not only 2 months but at least 6 months for sustainable

improvement. However, it should be monitored to see how effective the improvement that has been made from this research proposal, so that the results of this study can be performed by the management of hotel Kartika International and will be useful for hotel visitors.

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