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Service Quality Measurement System with Method *Service Quality (SERVQUAL) at BRI Kedungwaru Unit, Tulungagung Regency*

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Abstract

As the growth of customers at BRI increases, BRI management is required to satisfy the service they provide to customers in order to maintain the achievements they have achieved and reduce customer complaints regarding their dissatisfaction with bank services, so it is important for banks to know the service in the eyes of customers in in terms of quality service and customer satisfaction. The research technique in this research is Development Research or Information Technology Engineering and this research uses a quantitative approach where data will be collected by carrying out measurements, which will then produce data figures. Meanwhile, the sampling method used was Purposive Sampling. This research was conducted at the BRI Unit office using a sample of 50 customers. Data was collected by distributing questionnaires. Next, the data will be sampled for testing system development built using the Service Quality Method. The results obtained from this research are software engineering that displays satisfaction criteria assessments that can be used to improve and enhance services in providing services to consumers.

Keywords: *Customers, Service Quality (Servqual), Information Technology Engineering, Software Engineering.*

INTRODUCTION

In this era of globalization, quality is seen as one of the tools to achieve competitive advantage (Lukáč et al., 2020; Škarica, 2020), since quality is one of the main factors that determine the selection of products and services for consumers (Calero et al., 2015; Novikova et al., 2016). Consumer satisfaction will be achieved if the quality of products and services provided is in accordance with their needs (Celotto et al., 2015; Novikova et al., 2016).

Customer satisfaction is influenced by the perception of service quality (Kuo et al., 2013; Liu et al., 2017), product quality (Bhowmick &; Seetharaman, 2023; Hsu et al., 2020), price (Mahmud et al., 2013; Rahmoune et al., 2022) and factors that are personal and momentary situation (Pavithra et al., 2014). Customer satisfaction assessment is a necessity for management (Das &; Mishra, 2018; Ferrentino &; Boniello, 2020; Hayati &; Amirnejad, 2016). Satisfaction assessment is an evaluation for management to improve services (Chen et al., 2015).

Quality and customer satisfaction are closely related (Ali et al., 2020; Pavlíčková, 2015). Quality gives an impetus to customers to establish a strong bond with the company. This kind of bonding in the long run allows the company to carefully understand customer expectations and their needs, thereby increasing customer satisfaction as the company maximizes or eliminates the unpleasant customer experience.

Bank Rakyat Indonesia (BRI) is one of the largest state-owned banks in Indonesia. Initially, Bank Rakyat Indonesia (BRI) was established in Purwokerto, Central Java by Raden Bei Aria Wirjaatmadja under the name De Poerwokertosche Hulp en Spaarbank der Inlandsche Hoofden. The institution was established on December 16, 1895 (Ningsih, 2023). President Director of PT Bank Rakyat Indonesia (Persero) Tbk or BRI, Sunarso revealed a number of impressive achievements in handling loans to MSMEs. It is recorded that until 2024, BRI handles up to 44 million customers (Hakim, 2024). However, Bank BRI customer satisfaction is still relatively low (Sari &; Wening, 2022).

The increasing growth of customers at BRI, BRI management is required to be satisfied with the services they provide to customers to maintain the achievements that have been achieved and reduce customer complaints over their dissatisfaction with bank services, so it is important for banks to know their position in the eyes of customers in terms of quality service and customer satisfaction. This is done to build a good image in the eyes of the public, because if there is no improvement in performance in terms of service quality, customer satisfaction will continue to decline and the number of customer complaints about the performance of the BRI Kedungwaru Unit in terms of service quality will continue to increase. In other words, the more our customers are increasingly required to maintain service because retaining customers is more difficult than finding new customers (El-Manstrly, 2014; Sharma et al., 2023; Thangeda et al., 2024).

Of the various existing analysis methods, the Service Quality (Servqual) method is to analyze the level of customer service satisfaction with 5 (five) main dimensions of the servqual method, namely Tangibles, Reliability, Responsiveness, Assurance and Emphaty which are used as a reference in measuring service quality (Akdere et al., 2020; Mathong et al., 2020; Razik et al., 2018).

METHOD

The research technique used in this research technique is an information technology

engineering research technique (Cruz & Cruz, 2020). Research in the field of engineering is applied research conducted to increase benefits to engineering problems. Engineering research (including software research) is research that applies science into a design to obtain performance in accordance with specified requirements. The design is a synthesis of design elements combined with the scientific method into a model that meets certain specifications. Research begins with determining design specifications that meet the specified specifications, choosing the best alternative, and proving that the selected design can meet the specified requirements efficiently, effectively and at low cost. Example: Research on computer software (Zulfiandri, 2019).

The results obtained from this study can be used for improvements in testing methods and procedures and improvements in the activity itself. In this study the data will be collected by making measurements, which will then produce numerical data, then the approach used is a quantitative approach. Quantitative approach means an approach that in the process of analysis uses statistical techniques. In addition, the research variable data is in the form of numerical or numeric data, this is in accordance with the characteristics of statistics themselves which are always with numbers.

The sample method used in this study was Purposive Sampling. Researchers select purposive samples objectively. This sample selection is done because researchers have understood that the information needed can be obtained from one particular target group that is able to provide the desired information because they do have such information and they meet the criteria determined by the researcher (Ferdinand, 2014).

In information technology engineering research, service quality measurement will use the *Service Quality (Servqual) method. This Servqual model is based on* a multi-item scale designed to measure customer expectations and perceptions. As well as the gap between the two in the five dimensions of service quality, namely (Reliability, responsiveness, assurance, Emphaty, and Physical Evidence), the five dimensions of quality are described in several question items for expectation attributes and perception variables based on the Likert scale. The servqual score for each pair of questions for each customer can be calculated based on the following formula (Zeithaml & Berry, 1990).

SCORE.SERVQUAL = PERCEPTION SCORE – EXPECTATION SCORE

Service quality gap scores at various levels in detail can be calculated based on:

- Item-by-item analysis, e.g. P1 – H1, P2 – H2, etc. Where P = perception and H = expectation.
- Dimension-by-dimension analysis, e.g. (P1 + P2 + P3 + P4 / 4) – (H1 + H2 + H3 + H4 / 4) where P1 to P4 and H1 to H4 reflect 4 statements of perception and expectation related to a particular dimension.
- The calculation of a single measure of service quality/servqual gap is (P1 + P2 + P3+...+P22/22) – (H1 + H2 + H3+...+H22/22)
- To analyze the quality of the services provided, the formula is used (Besterfield et al., 2012)
- Quality (Q) = $\frac{Perception\ (P)}{Hope\ (H)}$

  If quality (Q) $\geqslant$ 1, Then the quality of service is said to be good.

System Planning

Use Case Diagram illustrates the general flow of users in service quality measurement software engineering. There are 3 (three) users who can access the system, namely Custuner Relation, Admin and Company Manager. Outside the system there is a Customer as a source of data that will provide an assessment of service quality.

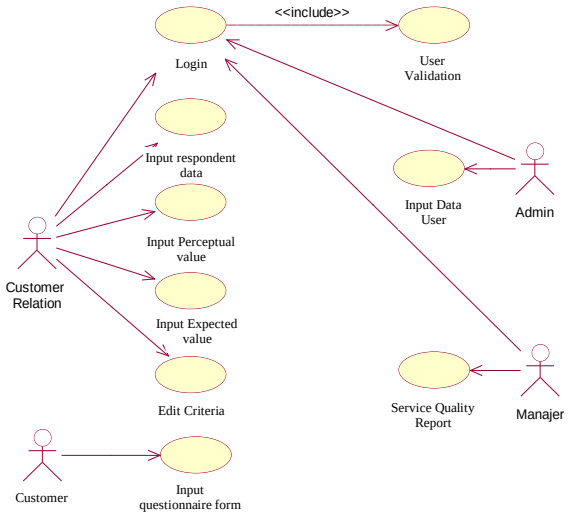

Figure 1 Use Case Diagram

The Activity Diagram Manager defines the procedural logic of the user-ka flow to the system in parallel to show the stages in measuring service quality.

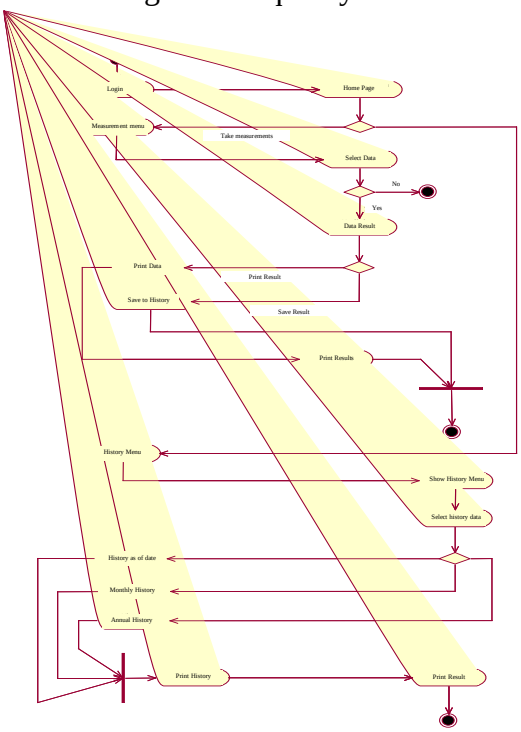

Figure 2 Activity Diagram

Activity Diagram Customer Relation thinks of the procedural logic of work flow by user-cs to the system in parallel to show the stages in inputting value data obtained from customers which will then be processed to produce results measuring the quality of service to customers.

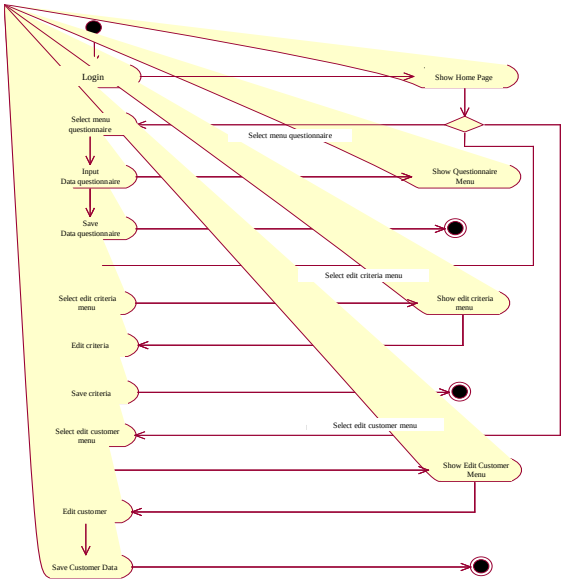

Figure 3 Activity Diagram Customer Relation

Squencial Manager Diagram Illustrates a manager scenario (KaUnit) that shows a number of messages that are between the application menu object and the core of the application in measuring service quality.

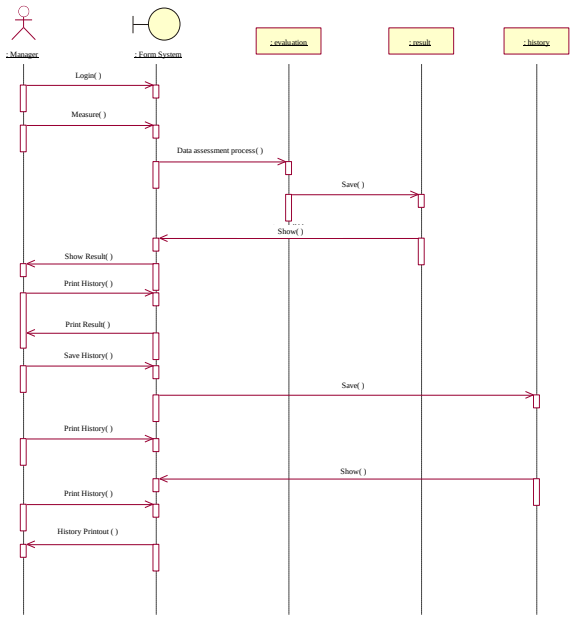

Figure 4 Squencial Diagram Manajer

The CS Squencial Diagram illustrates a Customer Relations scenario that shows a number of messages that are between the application menu object and the core of the application in inputting

value data obtained from customers which will then be processed to produce results measuring the quality of service to customers

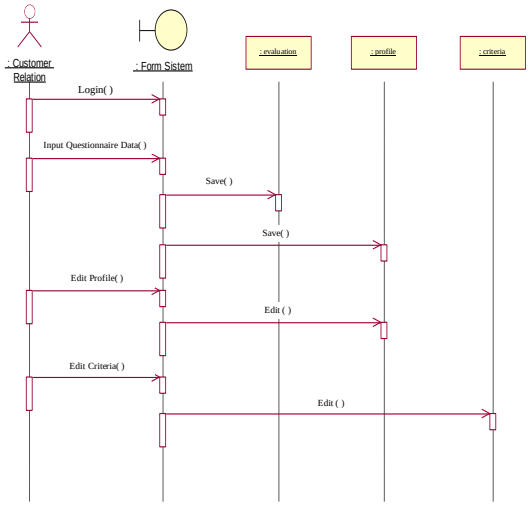

Figure 5 Squencial Diagram Customer Relation

Class diagrams provide a broad view of service quality measurement system applications by showing their classes and their relationships.

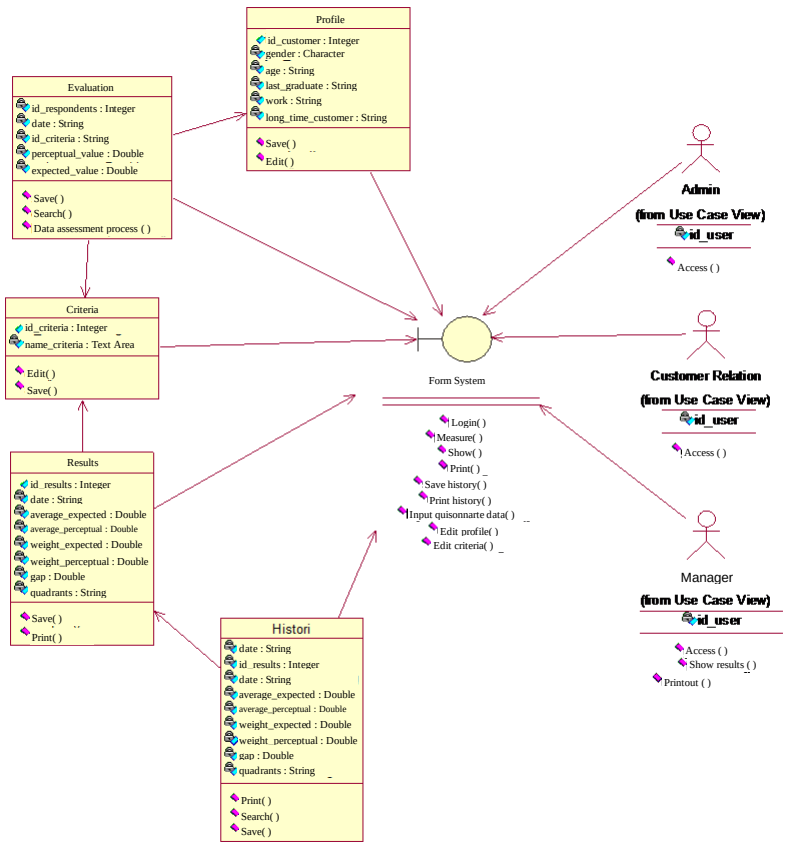

Figure 6 Class Diagram

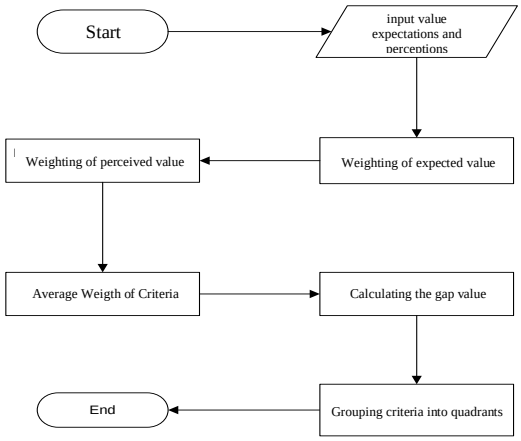

Figure 7 Service Quality Method (SERVQUAL) flowchart

In the flowchart above, it can be seen that after the perception and expectation value data from each criterion is entered, it will be processed to find the weight of the perception and expectation values, followed by finding all the averages of the weights that have been calculated, then from the average value of each criterion, after that the next process is mapping / grouping each criterion into quadrants to find out how the quality of service exists.

RESULTS AND DISCUSSION

Through this stage, researchers conduct research directly through the distribution of questionnaires. There are 15 criteria and in the assessment of each criterion using *skla likert.*

Table 1
Service Quality Measurement System Criteria Table

Criteria	Information
K1	Customer Service *officers* provide neat work desks, there are nameplates and stationery for completeness of the application form
K2	Customer Service officers dressed in clean and neat uniforms
K3	Customer Service officers pay attention to makeup, hair and accessories they wear
K4	Customer Service officers have insight into banking
K5	Customer Service officers have the ability to explain the products and services offered by the bank concerned clearly
K6	Customer Service officers help provide solutions to complaints felt by their customers
K7	Customer Service officers stand to greet customers, give smiles and greetings, and invite them to sit when customers come
K8	Customer Service officers carry out services quickly
K9	Customer Service officers assist customers in filling out forms and collecting complete requirements
K10	Customer Service officers assure customers that it is safe to be a customer of the bank
K11	Customer Service officers guarantee comfortable, precise, and thorough service
K12	Customer Service officers promise time to resolve problems and keep them
K13	Customer Service officers listen to customer complaints earnestly
K14	Customer Service Officer apologizes for any complaints and inconveniences submitted by customers
K15	Customer Service Officer says thank you and greetings at the end of the service

Assessment of the Level of Expectations and the Level of Customer Perception of the Service Quality Criteria of BRI Kedungwaru Unit

Table 2
Assessment of Customer Expectations on Service Quality Criteria

No	Criteria	Expected Value				
		1	2	3	4	5
1	K1	0	0	2	20	28
2	K2	0	0	4	26	20
3	K3	4	2	9	21	14
4	K4	0	0	1	19	30
5	K5	0	0	0	18	32
6	K6	0	0	6	22	22
7	K7	0	2	9	26	13
8	K8	0	0	3	21	26
9	K9	0	0	8	30	12
10	K10	1	1	6	26	16
11	K11	0	0	5	18	27
12	K12	0	2	7	21	20
13	K13	0	0	5	19	26
14	K14	0	1	5	22	22
15	K15	0	0	12	25	13

Table 3
Assessment of the level of customer perception of service quality criteria

No	Criteria	Perceptual Value				
		1	2	3	4	5
1	K1	0	0	3	32	15
2	K2	0	0	5	32	13
3	K3	2	0	6	31	11
4	K4	0	1	10	24	15
5	K5	0	1	10	27	12
6	K6	0	1	11	29	9
7	K7	0	0	11	27	12
8	K8	1	1	14	24	10
9	K9	0	1	18	25	6
10	K10	0	0	11	28	11
11	K11	1	0	7	31	11
12	K12	1	1	13	30	5
13	K13	2	0	6	31	11
14	K14	0	0	14	28	8
15	K15	0	0	9	24	17

Calculation of service expectation weighting

$\Sigma yi = (\Sigma$ TPn x 1)+(ΣKPn x 2)+(Σ CPn x 3) + (ΣPn x 4) + (Σ SPn x 5)

Information:

Σyi = The sum of the weights of the answer to the perception of the variable to – i
Σ TPn = The number of people who choose an answer is not important
Σ KPn = The number of people who choose answers is less important
Σ CPn = The number of people who choose answers is quite important
Σ Pn = The number of people who chose the answer matters
Σ SPn = The number of people who choose answers is very important

For the average respondent's answer to perception in the field, it can be calculated by the equation $yi = (\Sigma yi) / n$

Information:

yi = average respondent's answer to the perception value of the i-th attribute
Σy = number of answer weights of the I-th attribute wishful statement
n = number of respondents

Calculation of Service Perception weights

$\Sigma xi = (\Sigma$ TP x 1) + (ΣKP x 2) + (Σ CP x 3) + (Σ P x 4) + (Σ SP x 5)

Information:

Σxi = the sum of the weights of the perceptual answer variable to – i
Σ TP = number of people who voted for a dissatisfied answer
Σ KP = number of people who chose a less satisfied answer
Σ CP = number of people who voted for a satisfied answer
Σ P = number of people who voted for a satisfied answer
Σ SP = number of people who voted for a very satisfied answer

For the average respondent's answer to perception in the field, it can be calculated by the equation $xi=(\Sigma xi)/n$

Information:

xi = average respondent's answer to the i-th attribute perception value
Σx = number of answer weights of the I-th attribute wishpoint statement
n = number of respondents

Gap Value Calculation

$SQi = xi – yi$

Information:

SQi = i-th attribute gap value
xi = Average value of the statement of the i-attribute
yi = The average value of the ith attribute harpan

Grouping Criteria into Quadrants, All the results of the calculation above, are entered into one of the following quadrants:

- Quadrant A (Focus Here)
  This quadrant contains service quality criteria that have a high level of importance or above the average value, while the level of performance is considered low.
- Quadrant B (Keep Achievement)
  This quadrant contains service quality criteria that have a high level of importance and level of performance or above the average value.
- Quadrant C (Low Priority)
  This quadrant contains service quality criteria that have a low or below average level of importance and level of performance.
- D quadrant (can be excessive)
  This quadrant contains service quality criteria that have a low level of importance, while the company's performance level is high.

Table 4
Results of weighting and grouping criteria based on quadrants.

No	Criteria	Perceptual Value		Expected Value		Value Gap	Quadrant
		Weight Value	Average	Weight Value	Average		
1	K1	212	4,24	226	4,52	-0,28	Quadrant B
2	K2	208	4,16	216	4,32	-0,16	Quadrant B
3	K3	199	3,98	189	3,78	0,2	Quadrant D
4	K4	203	4,06	229	4,58	-0,52	Quadrant B
5	K5	200	4	232	4,64	-0,64	Quadrant B
6	K6	196	3,92	216	4,32	-0,4	Quadrant A
7	K7	201	4,02	200	4	0,02	Quadrant D
8	K8	191	3,82	223	4,46	-0,64	Quadrant A
9	K9	186	3,72	204	4,08	-0,36	Quadrant C
10	K10	200	4	205	4,1	-0,1	Quadrant D
11	K11	201	4,02	222	4,44	-0,42	Quadrant B
12	K12	187	3,74	209	4,18	-0,44	Quadrant C
13	K13	199	3,98	221	4,42	-0,44	Quadrant D
14	K14	194	3,88	215	4,3	-0,42	Quadrant A
15	K15	208	4,16	201	4,02	0,14	Quadrant D
Total			59,7		64,16		
Average			3,98		4,28		

Through a questionnaire distributed to customers of Bank BRI Kedungwaru Unit - Tulungagung, 50 customers for the trial of the Service Quality Measurement System of Bank BRI Kedungwaru Unit - Tulungagung produced information about what services must be improved based on criteria. From the results of the system calculation, it can be concluded that customer satisfaction with criteria K9 "Customer Service Officer assists customers in filling out forms and collecting complete requirements" and K12 "Customer Service Officer promises time to solve problems and keep them" is included in quadrant C. This criterion is considered less important by customers and its implementation is still not good. Although it is considered less important for customers, the implementation must still be improved. Some banks in Indonesia have reduced manual form filling or using automation applications (Sutarno &; Gaffar, 2023). Customers prefer the process of filling out forms carried out by bank officers through the system on their computer.

With the information system software, the process of inputting customer data, checking installment lists and realization of disbursements can be done quickly and accurately, and is better than the previous process period (Suryadi, 2018).

The results of measuring customer satisfaction with criteria K3, K7, K10, K13, K15 are included in quadrant D, these criteria are considered unimportant by customers, but the bank carries them out well. Then the results of measuring customer satisfaction with criteria K1, K2, K4, K5, K6 are included in quadrant B, these criteria that are considered important by customers, have been implemented by the bank in accordance with what is expected by customers and must be maintained.

K6 Criteria "Customer Service Officers help provide solutions to complaints felt by their customers". This criterion is included in quadrant A means that this criterion is considered very important for customers, but the bank has not implemented it in accordance with customer expectations. Bank services in this case have not been maximized because employees do not provide easy and fast solutions for customers. Employees should immediately serve, act quickly to help and provide solutions for customers in need in a timely manner, not delay and never underestimate customers (Apriyanti, 2024). This does clash with the existing rules in Indonesia. For example, when we lose, the required condition is to take care of the loss letter at the police station (Novita &; Tristiana, 2022). Although this is in accordance with existing regulations in Indonesia, this process hinders the service process.

K8 "Customer Service Officer carries out service quickly", K14 "Customer Service Officer apologizes for any complaints and inconveniences submitted by customers" included in quadrant A means that this criterion is considered very important for customers, but the bank has not implemented it in accordance with customer expectations. Customer inconvenience should be a priority that must be corrected immediately. So Customer Service should immediately apologize if there are complaints or inconveniences from customers (Sapi'i, 2024). This inconvenience causes longer queues. Several scenarios are needed to better simulate the length and number of queues as done by previous studies (Santi et al., 2022). If every complaint is not immediately corrected, it will become an even longer queue. So a faster and more effective complaint service process is needed.

System Evaluation / Trial

In the system evaluation assessment, several employees from the BRI Kedungwaru Unit Office will be assessed and the assessment uses a *Likert scale*.

Table 5
Evaluation Results Table

Criteria	Evaluator			Average
	1	2	3	
Assist the Bank in measuring service quality.	4	4	4	4
Knowing the quality of service based on satisfaction criteria.	4	4	3	3,67
Program Design.	4	3	5	4
Easy System Operation *(User Friendly).*	5	4	5	4,67
Rata-rata				4,08

From the results of the trial system, the assessment from the evaluator 4,08 is that overall the Service Quality Measurement System is good, and accurate compared to the results of measurements carried out manually. The criteria considered good by evaluators are the ease of

operating the system (*user friendly*) with a value of 4,67. Criteria that are considered lacking are service quality information based on satisfaction criteria that are felt to lack priority information on service criteria to determine a decision to improve service quality.

The existence of the system offered will help BRI employees in serving customers faster. Of course, the system can also help employees fill out the transaction forms needed by customers. More importantly, the system also helps to know which services should be improved. In the future, it is necessary to develop this system again so that it can make decisions quickly if there are complaints from customers.

CONCLUSION

The results of research and discussion in this study can be concluded from the service quality measurement system with the *service quality* (servqual) method can help the Bank Rakyat Indonesia Kedungwaru Unit to measure the quality of its services based on satisfaction criteria in improving service quality. 2. The system can carry out a calculation process that produces value to find out how the quality of Bank BRI Kedungwaru Unit services to its customers. The results of this study also provide information on criteria that are felt to be lacking by customers.

SUGGESTION

Based on the conclusions above, researchers provide suggestions for BRI Kedungwaru Unit - Tulungagung, from the results of this study, it is hoped that the company can improve the quality of service based on criteria generated from calculations by the system for customer satisfaction with service. Suggestions for researchers can then be developed into web-based applications or mobile applications. This research can be developed with the addition of other methods to determine the value of more optimal results. And perform further stages using more analytical methods

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