

## A binary logistic regression analysis of the effects of price, service quality, and promotion on customer satisfaction at Dita Pratama store

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### Abstract

In today's highly competitive business environment, organizations must demonstrate performance that aligns with customer expectations to achieve and sustain customer satisfaction. Customer satisfaction can be defined as the extent to which customers' needs, desires, and expectations are fulfilled, leading to repeat purchases and continued loyalty. One of the most influential determinants of customer satisfaction is service quality. When service quality is inadequate and customers experience dissatisfaction, they are less likely to return and may share their negative experiences with others. Such behavior can threaten the firm's reputation and long-term sustainability. Dita Pratama, located at Kampung Jerk King kit No. 84, Semarang City, is a retail enterprise engaged in the sale of tools and building interior materials. The company offers ready-to-sell products to both distributors and end customers. Given the broad and diverse characteristics of its end-customer base, understanding the factors that significantly influence customer satisfaction is essential for effective managerial decision-making and strategic planning, so that can be utilized to evaluate these influencing factors by logistic regression analysis. This statistical model allows researchers to analyze and predict the effects of multiple independent variables on customer satisfaction as a dependent variable and in this study is expected to identify the variables that have a statistically significant impact on the level of customer satisfaction at store. Based on the analysis of customer data at Dita Pratama Store, the majority of the 100 questionnaire respondents were male and aged 36–45 years. The results of data processing indicate that all items in the questionnaire are valid, as each item's calculated r value (r-count) is greater than the r-table value. The reliability test results also demonstrate consistency or acceptable reliability, showing that the variables of price (X1), service quality (X2), and promotion (X3) each have Cronbach's Alpha coefficients greater than 0.6. The data were analyzed using binary logistic regression in SPSS. The results reveal that only two variables, price (X1) and service quality (X2), meet the criteria for having a significant effect on customer satisfaction, as indicated by their significance level ( $\alpha < 0.10$ ). In contrast, the promotion variable (X3) does not have a statistically significant influence on customer satisfaction, as indicated by its significance level ( $\alpha > 0.10$ ). Based on the findings of this study on logistic regression analysis, several recommendations can be proposed as follows: Managerial Focus on Price and Service Quality and Periodic Customer Satisfaction Surveys.

**Keywords:** Logistic Regression; Customer Satisfaction; Service Quality; Retail

### 1. Introduction

In today's highly competitive business environment, companies must deliver performance that aligns with customer expectations in order to achieve customer satisfaction. According to Band in 1991 [1], customer satisfaction reflects the extent to which customers' needs, desires, and expectations are fulfilled, which in turn leads to repeat purchases and continued loyalty. Achieving and maintaining customer satisfaction is essential for ensuring the long-term sustainability of a business. Therefore, identifying and understanding the factors that serve as indicators of customer satisfaction are critical for companies to conduct evaluations and implement improvements that enhance business performance.

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One of the most influential determinants of customer satisfaction is service quality. When the quality of service is poor and customers experience dissatisfaction, they are less likely to return and may share their negative experiences with other potential customers. Such negative word-of-mouth communication can damage the company's reputation and threaten business continuity. According to Wedarini in 2012 [2], customers who make repeat purchases and share their positive experiences with others can be considered satisfied customers.

However, customer satisfaction is influenced not only by service quality but also by other factors such as product quality, price, and promotion. High product quality that meets customer expectations can foster a sense of satisfaction and build customer trust, which contributes positively to long-term business performance. Price also plays a crucial role in shaping customer perceptions. According to Husein in 2002 [3], price refers to the amount of value exchanged by customers for the benefits derived from owning or using a product or service. Price is generally determined through negotiation between buyers and sellers or set unilaterally by the seller for all customers. When customers perceive that the price of a product exceeds the benefits they receive, it often results in negative evaluations and dissatisfaction.

These factors can serve as valuable inputs for business evaluation and decision-making processes that aim to enhance competitiveness and customer retention. Therefore, it is essential to assess the extent to which each factor influences customer satisfaction so that companies can prioritize effective strategies and implement decisions aligned with customer preferences and market segmentation.

Dita Pratama, located at Kampung Jeruk Kingkit No. 84, Semarang City, is a retail enterprise engaged in the sale of tools and building interior materials. The company offers finished products that are distributed both to other distributors and directly to end customers. Given its broad and diverse target market, understanding which factors significantly influence customer satisfaction is crucial for supporting effective and evidence-based decision-making. Based on this background, the research problems addressed in this study are as follows: To identify the factors that influence customer satisfaction at Dita Pratama; and determine which factors have the most significant effect on customer satisfaction at Dita Pratama, in order to propose actionable recommendations for improvement.

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## **2. Material and methods**

### **2.1. Material**

This study employs both qualitative and quantitative research approaches. The qualitative aspect of the research is conducted by describing and assessing the observed phenomena based on factual data obtained from the research object. Meanwhile, the quantitative aspect is carried out through interviews with the store owner and direct observation of the research site. The research subject in this study is Dita Pratama Store, with a focus on identifying existing problems related to decision-making processes aimed at achieving customer satisfaction. The object of this study is to examine the influence of service quality, product quality, price, and location factors on customer satisfaction at Dita Pratama Store. The objective is to determine the most appropriate evaluation and strategic recommendations for the company.

### **2.2. Methods**

The stages of this research consist of several systematic steps to ensure that the analysis produces valid and reliable results. These stages are described as follows:

### **2.3. Field Observation, Problem Identification, and Problem Formulation**

The research began with field observations conducted at Dita Pratama Store to obtain preliminary information related to the research topic. The results of the initial observation were used to identify problems, determine relevant variables, and select the most appropriate analytical methods for the study. These findings served as a foundation for the literature review and guided the search for theoretical and empirical references relevant to the research objectives, ensuring that the proposed solutions were accurate and evidence-based.

### **2.4. Literature Review**

The literature review stage was carried out to collect and present theoretical references relevant to the identified research problems. These theories form the foundation for developing the theoretical framework of this study. Theoretical references were obtained from books, national journals available online, academic articles, and previous research related to statistical methods in general and logistic regression analysis in particular.

## 2.5. Data Collection

This research analyzes the level of customer satisfaction at Dita Pratama Store in relation to factors such as price, service quality, and promotion. The data used in this study consist of primary and secondary data. Primary data were collected and processed directly by the researcher. These data were obtained through the distribution of questionnaires to respondents who had purchased products at Dita Pratama Store. The questionnaires measured variables using a Likert scale, with the following categories: 1 = very poor, 2 = poor, 3 = fair, 4 = good, and 5 = very good. Secondary data refer to supporting data that complement the primary data. These include indicators for each variable tested in relation to Dita Pratama Store. To facilitate the sampling process, the purposive sampling technique was employed, with the criteria that respondents must be customers of Dita Pratama Store. When the total population is large and its exact size is unknown, the sample size was determined using the formula proposed by Snedecor and Cochran in 1967 [4], as follows

$$n = \frac{Z^2 \rho(1 - \rho)}{e^2}$$

Where  $n$  represents the sample size,  $Z$  denotes the standard score for the selected significance level ( $\alpha$ ),  $e$  is the margin of error, and  $\rho$  is the estimated proportion within the population. Based on this calculation, the total sample for this study consisted of 100 respondents. The variables used in this study include the influence of price, service quality, and promotion as independent variables, and customer satisfaction as the dependent variable. The independent variables are divided into three dimensions: 1. Price (three indicators) are X11: Price affordability, X12: Price suitability with product quality, X13: Price competitiveness; 2. Service Quality (four indicators) are X21: Reliability, X22: Responsiveness, X23: Empathy, X24: Assurance; 3. Promotion (three indicators) are X31: Advertising, X32: Sales promotion, X33: Direct marketing. The dependent variable, customer satisfaction, is measured dichotomously, where  $Y_1$  = satisfied and  $Y_0$  = not satisfied.

### 2.5.1. Data Processing

The next stage involved processing the data obtained from the questionnaires and field observations. The collected data were analyzed using SPSS software with the logistic regression method to determine the magnitude and significance of the influence of each independent variable on customer satisfaction.

### 2.5.2. Analysis and Discussion

Following data processing, the results were analyzed and interpreted to evaluate the influence of the studied factors on customer satisfaction at Dita Pratama Store. The findings were then discussed in relation to the theoretical framework and previous research to formulate conclusions and managerial implications consistent with the data results.

### 2.5.3. Conclusion and Recommendations

The final stage of this research involves drawing conclusions and providing recommendations based on the data analysis and findings. The conclusions summarize the key results related to customer satisfaction at Dita Pratama Store, while the recommendations offer practical suggestions for improving customer satisfaction and guidance for future research on similar topics.

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## 3. Results and discussion

In this study, questionnaires were distributed to 100 respondents who were customers of Dita Pratama Store over a period of one month, from mid-April to mid-May 2025. The characteristics of Dita Pratama's customers are presented below.

### 3.1. The Characteristics of Respondents

The characteristics of Dita Pratama's customers based on age and gender are presented in Tables 1 and 2 below. Based on the data presented in Table 1, the dominance of respondents in this study were aged 36–40 years, while Table 2 indicates that all respondents were male. This demographic profile suggests that Dita Pratama Store primarily serves customers within a mature, working-age group who are likely to be actively engaged in construction-related or technical occupations, which aligns with the store's focus on tools and building interior materials. The predominance of male respondents is consistent with the general characteristics of the hardware and construction retail sector, where male customers typically dominate the market. This demographic concentration may influence customer expectations and preferences, particularly regarding factors such as product durability, pricing, and service efficiency. Understanding

these demographic patterns is therefore essential for Dita Pratama's management in developing targeted marketing strategies and improving service quality that align with the primary customer segment's needs.

**Table 1** The characteristics of customers by age

Age (Year)	Frequency	Percentage
≤ 25	1	1 %
26 – 35	8	8 %
36 – 45	56	56 %
46 – 55	35	35 %
> 55	0	0 %
Total	100	100%

**Table 2** The characteristics of customers by gender

Gender	Frequency	Percentage
Female	0	0 %
Male	100	100 %
Total	100	100%

### 3.2. Test Results

The characteristics of Dita Pratama's customers based on tests are presented in Tables 3 until 6 and in Figure 1 until 4 below.

#### 3.2.1. Significance Test

**Table 3** Validity Test

Variable	Statement	Correlation	Significance	Result
X <sub>1</sub> : Price	X <sub>11</sub> : Price Affordability	0,277	0,005	Valid
	X <sub>12</sub> : Price Suitability with Product Quality	0,345	0,000	Valid
	X <sub>13</sub> : Price Competitiveness	0,311	0,002	Valid
X <sub>2</sub> : Service Quality	X <sub>21</sub> : Reliability	0,409	0,000	Valid
	X <sub>22</sub> : Responsiveness	0,315	0,000	Valid
	X <sub>23</sub> : Empathy	0,428	0,000	Valid
	X <sub>24</sub> : Assurance	0,500	0,000	Valid
X <sub>3</sub> : Promotion	X <sub>31</sub> : Advertising	0,407	0,000	Valid
	X <sub>32</sub> : Sales Promotion	0,403	0,000	Valid
	X <sub>33</sub> : Direct Marketing	0,403	0,000	Valid

The validity test for the questionnaire items in this study was conducted using the correlation technique, in which an item is considered valid if the calculated correlation coefficient (r-count) is greater than the critical value of the correlation table (r-table). With a total of 100 respondents, the r-table value is 0.1966. Therefore, if the r-count value

exceeds 0.1966, the questionnaire item can be considered valid. The results of the validity test are presented in Table 3. After conducting the validity test and confirming that all questionnaire items were deemed valid, a reliability test was subsequently performed using the Cronbach's Alpha coefficient. The reliability test was conducted to assess the consistency of the questionnaire items used in this study. Reliability was measured using Cronbach's Alpha coefficient, where an instrument is considered reliable if the Cronbach's Alpha value exceeds 0.6. The results of the reliability analysis indicate that all variables, price (X1), service quality (X2), and promotion (X3), have Cronbach's Alpha values greater than 0.6, demonstrating that the questionnaire items are reliable and can be used consistently to measure customer satisfaction at Dita Pratama Store. The detailed results of the reliability test are presented in Table 4.

**Table 4** Reliability Test

Variable	Cronbach's Alpha	Result
X <sub>1</sub> : Price	0,803	Reliable
X <sub>2</sub> : Service Quality	0,827	Reliable
X <sub>3</sub> : Promotion	0,689	Reliable

The Model Summary resulting from the binary logistic regression analysis in this study is presented in Figure 1. Based on the figure, the estimated parameter value of  $-2$  Log Likelihood is 41.144. The R-square values are 0.520 (52.0%) for the Cox and Snell measure and 0.763 (76.3%) for the Nagelkerke measure. The obtained  $-2$  Log Likelihood value of 41.144 indicates the level of model fit, where a smaller value suggests that the model better explains the observed data. Furthermore, the Cox and Snell  $R^2$  value of 0.520 and the Nagelkerke  $R^2$  value of 0.763 demonstrate that the independent variables, price, service quality, and promotion, collectively explain approximately 76.3% of the variation in customer satisfaction at Dita Pratama Store. The remaining 23.7% of the variation is influenced by other factors not included in this model. The partial test was conducted using the Wald statistic, as shown in Table 5 below. Based on the results presented in the table, it can be concluded that at a 5% significance level, there are two variables that have a significant influence on the response variable, namely price, with a Wald test value of 10.318, and service quality, with a Wald test value of 3.069. The results of the Wald test indicate that the price and service quality variables significantly affect customer satisfaction at the 5% significance level. This finding implies that variations in pricing strategies and the quality of services provided by Dita Pratama Store play a crucial role in determining the level of customer satisfaction. In contrast, the promotion variable does not show a statistically significant effect, suggesting that promotional activities carried out by the store have not been a major determinant in influencing customer satisfaction. Therefore, the management should prioritize improvements in pricing policies and service quality to enhance customer satisfaction and foster customer loyalty.

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	41.144 <sup>a</sup>	.520	.763
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.			

**Figure 1** Model Summary

**Table 5** Partial Test

Variable	Wald	DB	Chi-Square
X <sub>1</sub> : Price	10,318	1	3,189
X <sub>2</sub> : Service Quality	3,069	1	
X <sub>3</sub> : Promotion	0,319	1	
Intercept	14,270	1	

### 3.2.2. Logistic Regression Analysis

After conducting the significance test, the next step was to develop the model based on the coefficient values presented in Figure 2 below. Based on the figure, the variables price and service quality have significance levels of  $\alpha < 0.10$ , indicating that both variables have a significant influence. Consequently, the resulting binary logistic regression model can be expressed as:

$$Y = -16.638 + 1.237X_1 + 0.477X_2$$

The Odds Ratio (OR) was used to facilitate the interpretation of the binary logistic regression model. As previously identified, the significant predictor variables affecting the response variable are price and service quality, and their corresponding odds ratio values are presented in Table 6. Based on the odds ratio values, the binary logistic regression model can be interpreted as follows: customers who perceive the price as more affordable, appropriate to product quality, and competitive are 3.447 times more likely to be satisfied compared to those who do not. Meanwhile, customers who perceive the service quality as good are 1.611 times more likely to be satisfied compared to those who perceive it as poor, assuming other variables remain constant. The results of the binary logistic regression analysis reinforce the theoretical framework that identifies price and service quality as key determinants of customer satisfaction in the retail sector. The finding that price significantly influences satisfaction aligns with the study by Kotler and Keller in 2016 [5], which states that a fair and competitive price can enhance customers perceived value and purchasing satisfaction. In contrast, the insignificance of the promotion variable suggests that promotional activities at Dita Pratama Store have not yet been effective in shaping customers' perceptions or decision-making processes. This may indicate that customers prioritize tangible factors such as price fairness and service responsiveness over short-term promotional incentives. Therefore, the management of Dita Pratama Store should focus on improving pricing strategies and service delivery consistency while re-evaluating promotional efforts to ensure they align with customer expectations and purchasing behavior.

Variables in the Equation									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	Harga	1.237	.385	10.318	1	.001	3.447	1.620	7.334
	KulPel	.477	.272	3.069	1	.080	1.611	.945	2.747
	Prom	-.270	.479	.319	1	.573	.763	.298	1.952
	Constant	-16.638	4.404	14.270	1	.000	.000		

a. Variable(s) entered on step 1: Harga, KulPel, Prom.

**Figure 2** Coefficient Variable

**Table 6** Odds Ratio

Variable	Exp(β)
X <sub>1</sub> : Price	3,447
X <sub>2</sub> : Service Quality	1,611

The Hosmer–Lemeshow goodness-of-fit test yielded a Chi-square value of 3.189 with 8 degrees of freedom, and a corresponding significance level of 0.922, are presented in Figure 3. Because the p-value exceeds the conventional threshold of 0.05, the null hypothesis of adequate model fit cannot be rejected. These results indicate that the logistic regression model demonstrates a good overall fit, with no statistically significant discrepancy between the observed outcomes and those predicted by the model. Thus, the model can be considered appropriate for explaining the relationship between the predictors and the outcome variable.

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	3.189	8	.922

**Figure 3** Hosmer and Lem show Test

Based on Figure 4, the classification analysis indicates that the logistic regression model demonstrates strong predictive capability. For respondents categorized as Not Satisfied, the model correctly classified 20 out of 26 cases, corresponding to an accuracy rate of 76.9%. In contrast, for the Satisfied category, the model correctly identified 71 out of 74 cases, yielding a higher accuracy rate of 95.9%. Overall, the model achieved a correct classification rate of 91.0%, indicating that the model performs well in distinguishing between levels of customer satisfaction. These findings suggest that the model provides a reliable classification of the dependent variable based on the predictors included.

Classification Table <sup>a</sup>					
Observed			Predicted		
			Y (Kepuasan Pelanggan)		Percentage Correct
			Tidak Puas	Puas	
Step 1	Y (Kepuasan Pelanggan)	Tidak Puas	20	6	76.9
		Puas	3	71	95.9
Overall Percentage					91.0

a. The cut value is .500

Figure 4 Classification Rule

#### 4. Conclusion

Based on the analysis of customer data at Dita Pratama Store, the majority of the 100 questionnaire respondents were male and aged 36–45 years. The results of data processing indicate that all items in the questionnaire are valid, as each item's calculated *r* value (*r*-count) is greater than the *r*-table value. Furthermore, the reliability test results also demonstrate consistency, showing that the variables of price (X1), service quality (X2), and promotion (X3) each have Cronbach's Alpha coefficients greater than 0.6, which indicates acceptable reliability. The data were analyzed using binary logistic regression in SPSS. The results reveal that only two variables—price (X1) and service quality (X2)—meet the criteria for having a significant effect on customer satisfaction, as indicated by their significance level ( $\alpha < 0.10$ ). In contrast, the promotion variable (X3) has a significance value of 0.573, which exceeds the threshold of 0.10. This finding suggests that promotion does not have a statistically significant influence on customer satisfaction at Dita Pratama Store. Based on the findings of this study on logistic regression analysis, several recommendations can be proposed as follows: 1) Managerial Focus on Price and Service Quality (the results indicate that price and service quality are the two most influential factors affecting customer satisfaction). Therefore, it is recommended that the store's management place greater emphasis on these two aspects. Implementing effective policies and strategies related to pricing and service improvement is expected to enhance customer satisfaction, which in turn may lead to increased customer retention and long-term profitability. Satisfied customers are more likely to make repeat purchases and become loyal patrons. 2) Periodic Customer Satisfaction Surveys (The store conducts periodic surveys to monitor potential shifts in the factors influencing customer satisfaction). Regular feedback collection will help the store remain responsive to customer needs and ensure continuous improvement in service delivery and business performance. 3) Suggestions for Future Research. Future studies are encouraged to examine additional variables that may serve as indicators of customer satisfaction. Incorporating other relevant factors could broaden the understanding of logistic regression analysis and provide deeper insights into the determinants of customer satisfaction across different retail contexts.

#### Compliance with ethical standards

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##### Disclosure of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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