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Price, Service Quality, and Product Diversity Perceptions and Customer Loyalty at Nahdiana Ketanggungan Printing, Brebes Regency

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Abstract

This study aims to analyze the influence of price perception, service quality perception, and product diversity perception on customer loyalty at Nahdiana Printing, Ketanggungan, Brebes Regency. A quantitative approach was employed, collecting data through questionnaires distributed to 100 respondents selected via purposive sampling. Data were analyzed using multiple linear regression with IBM SPSS version 22. The results show that price perception, service quality perception, and product diversity perception each have a positive and significant partial effect on customer loyalty (sig. 0.002, 0.001, and 0.033, respectively). Simultaneously, the three variables significantly influence customer loyalty (sig. < 0.001), explaining 48.5% of its variation (adjusted R square). Among the three variables, service quality perception emerged as the most dominant factor, underscoring the critical role of responsive, accurate, and friendly service in retaining customers of printing businesses. These findings contribute to the understanding of consumer behavior in the printing service sector and provide practical guidance for Nahdiana Printing in strengthening customer loyalty management.

Keywords: *Price Perception; Service Quality; Product Diversity; Customer Loyalty; Printing*

I. INTRODUCTION

The development of digital technology has not eliminated people's need for printing services. Printed products such as banners, brochures, invitations, memos, and other promotional media are still widely used by companies, educational institutions, government agencies, and the general public as a means of communication and promotion. The printing sector therefore still plays a significant role in supporting marketing activities and the distribution of information. Printing companies are consequently required to innovate continuously, improve service quality, and strengthen their competitive advantage in order to meet customer needs as fully as possible.

The growth of the business world in Indonesia has also made business competition increasingly intense, including in the printing services sector. High competition pushes every business actor to provide more value to consumers through competitive prices, good service quality, and a complete range of products (Putra et al., 2022). In a competitive market, customers have many alternatives, so companies must be able to retain customer loyalty to sustain the business.

One printing business facing these conditions is Nahdiana Printing in Ketanggungan, Brebes Regency, established in 2012. It operates in printing services and the supply of office stationery, serving various public needs. Customer loyalty in a printing business is influenced by customers' perceptions of price, service quality, and the diversity of products offered. A price perceived as fitting the quality, satisfying service, and a diverse range of products can increase customer satisfaction and thereby encourage repeat purchases (Maulana et al., 2022).

Sales data of Nahdiana Printing for 2023–2025 show fluctuation (Fig. 1). Sales reached 3,000 units in 2023, rose to 3,535 units in 2024, but fell to 2,990 units in 2025. The decline indicates that customer loyalty is not yet fully stable. Consumers tend to move easily to other printers if they feel the price is unsuitable, the service is not optimal, or the product variety does not meet their needs (Saputra et al., 2024).

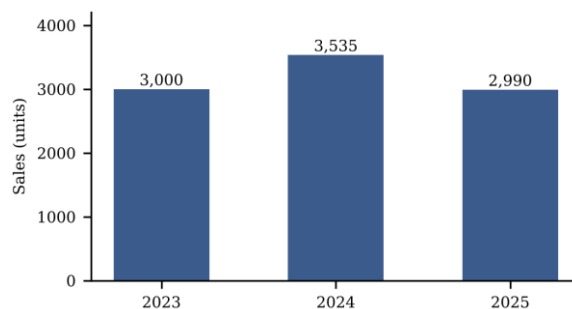


Fig. 1. Annual sales of Nahdiana Printing, 2023–2025.

A pre-survey shows that some customers still consider price when choosing a printer. In addition, complaint handling was judged not yet responsive, and product variety still needs to be improved. This indicates that price perception, service quality, and product diversity are important factors that can affect customer loyalty. The finding is in line with Prabowo et al. (2024), who state that price perception, service quality, and product completeness significantly affect customer loyalty. Hutagaol and Aulia (2023) also explain that service quality and price have a positive effect on customer loyalty.

Although earlier studies have examined the effect of price perception, service quality, and product diversity on customer loyalty, most were conducted in modern retail, e-commerce, or the food and beverage industry (Jasmine et al., 2026). Studies that specifically examine the three variables simultaneously in small and medium printing businesses in Brebes Regency remain very limited. This study fills that gap by taking Nahdiana Printing Ketanggungan as its object, a printing business with the unique characteristic of serving business and individual customers in a small urban area with increasing competition. Its specific contribution is to provide empirical evidence on the determinants of customer loyalty in the context of local printing services, which can serve as a practical reference for printing business managers in designing more targeted customer retention strategies. On this basis, the study aims to analyze the influence of price perception, service quality perception, and product diversity perception on customer loyalty at Nahdiana Printing Ketanggungan, Brebes Regency.

II. METHOD

This study is grounded in positivism and uses a quantitative method, which examines a particular population or sample through research instruments and statistical analysis to test hypotheses (Sugiyono, 2017). The population is all customers of Nahdiana Printing Ketanggungan; because their exact number is unknown, the population is treated as infinite. Purposive sampling, a type of non-probability sampling, was used to select respondents according to criteria

suited to the research objectives. Using Cochran's formula, the required sample was calculated at 96.04 respondents, which was rounded up to 100 respondents. Two types of data were used: primary data from questionnaires distributed directly to customers, and secondary data including internal company documents, sales reports, and other supporting documents.

Data were collected through a closed questionnaire with a five-point Likert scale, from strongly disagree to strongly agree, supported by documentation related to the research object. The independent variables are price perception (X1), service quality perception (X2), and product diversity perception (X3), and the dependent variable is customer loyalty (Y). Before analysis, the research instrument was tested for validity and reliability to ensure that all statement items were suitable for use. Data were analyzed with IBM SPSS version 22 in several stages: transformation of ordinal data into interval data using the Method of Successive Intervals (MSI), classical assumption tests (normality, multicollinearity, and heteroskedasticity), and multiple linear regression. The *t*-test was used to evaluate the partial effect of each independent variable, the *F*-test to measure the simultaneous effect of the three variables on customer loyalty, and the coefficient of determination (R^2) to determine how far the independent variables explain variation in the dependent variable.

III. RESULTS AND DISCUSSION

A. Classical Assumption Tests

Normality. The normal P-P plot shows that the residual points are distributed around the diagonal line and follow its pattern, which indicates that the residuals of the regression model are normally distributed. The one-sample Kolmogorov-Smirnov test (Table I) gives an asymptotic significance (2-tailed) of 0.200, which exceeds the 0.05 limit, so the residuals are normally distributed. The Monte Carlo significance (2-tailed) of 0.776 is also above 0.05, which confirms that the data meet the normality criterion. The regression model is therefore suitable for further analysis.

TABLE I. KOLMOGOROV-SMIRNOV NORMALITY TEST (UNSTANDARDIZED RESIDUAL)

Statistic	Value
N	100
Normal parameters: mean	0.0000000
Normal parameters: std. deviation	3.98892797
Most extreme differences: absolute	0.050
Most extreme differences: positive	0.046
Most extreme differences: negative	-0.050
Test statistic	0.050
Asymp. Sig. (2-tailed)	0.200
Monte Carlo Sig. (2-tailed)	0.776

Source: Primary data processed with SPSS 22 (2026). Lilliefors significance correction. Monte Carlo 99% CI: 0.765–0.787.

Multicollinearity. The tolerance value of each variable is above 0.10 and the Variance Inflation Factor (VIF) of each variable is below 10, so there is no multicollinearity among the variables. [Tolerance and VIF values to be added by the author.] *Heteroskedasticity.* The scatterplot shows no heteroskedasticity problem: the points form no wave, widening, or narrowing pattern and are scattered randomly above and below zero on the Y axis. The residual variance is therefore constant across predicted levels, and the heteroskedasticity assumption is met.

B. Multiple Linear Regression

TABLE II. MULTIPLE LINEAR REGRESSION AND PARTIAL TEST (T-TEST)

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	8.425	3.303		2.551	0.012
Price perception (X1)	0.310	0.096	0.305	3.245	0.002
Service quality perception (X2)	0.298	0.090	0.314	3.320	0.001
Product diversity perception (X3)	0.204	0.094	0.214	2.166	0.033

Source: Primary data processed with SPSS 22 (2026). Dependent variable: customer loyalty.

The multiple linear regression equation, based on the SPSS results in Table II, is:

$$Y = 8.425 + 0.310 X1 + 0.298 X2 + 0.204 X3 \quad (1)$$

The constant of 8.425 means that if price perception (X1), service quality perception (X2), and product diversity perception (X3) are all zero, customer loyalty is 8.425. The coefficient β_1 of price perception (0.310) indicates a positive

effect of price perception on customer loyalty at Nahdiana Printing Ketanggungan: an improvement in price perception leads to higher loyalty, and a decline in price perception lowers it. The coefficient β_2 of service quality perception (0.298) shows a positive effect: an improvement in service quality contributes to higher loyalty, and a decline in service quality is followed by lower loyalty. The coefficient β_3 of product diversity perception (0.204) shows a positive effect: greater product diversity raises loyalty, and less diversity lowers it.

C. Partial Test (t-Test)

Based on Table II, the significance value of price perception is 0.002, below 0.05, so H_0 is rejected and H_1 accepted: price perception significantly affects customer loyalty at Nahdiana Printing Ketanggungan, Brebes. The significance value of service quality perception is 0.001, below 0.05, so H_0 is rejected and H_1 accepted: service quality perception significantly affects customer loyalty. The significance value of product diversity perception is 0.033, below 0.05, so H_0 is rejected and H_1 accepted: product diversity perception significantly affects customer loyalty.

D. Simultaneous Test (F-Test) and Coefficient of Determination

TABLE III. SIMULTANEOUS TEST (ANOVA)

Source	Sum of squares	df	Mean square	F	Sig.
Regression	1581.507	3	527.169	32.127	< 0.001
Residual	1575.243	96	16.409		
Total	3156.750	99			

Source: Primary data processed with SPSS 22 (2026). Dependent variable: customer loyalty.

There is a significant simultaneous effect of price perception, service quality perception, and product diversity perception on customer loyalty at Nahdiana Printing Ketanggungan. This is shown by the simultaneous significance test in Table III, where the significance is < 0.001 (< 0.05), so H_0 is rejected and H_1 accepted; the fourth hypothesis of the study is therefore supported.

TABLE IV. MODEL SUMMARY

Model	R	R ²	Adjusted R ²	Std. error of estimate
1	0.708	0.501	0.485	4.05078

Source: Primary data processed with SPSS 22 (2026). Predictors: price, service quality, and product diversity perceptions.

Based on the adjusted R^2 of 0.485 (48.5%), the simultaneous contribution of price perception, service quality perception, and product diversity perception to customer loyalty reaches 48.5%, as shown in Table IV, while 51.5% of customer loyalty is explained by other factors not examined in this study.

TABLE V. SUMMARY OF HYPOTHESIS TESTS

Variable	Beta	t	Sig.	Decision
Price perception → customer loyalty	0.305	3.245	0.002	Significant (+)
Service quality perception → customer loyalty	0.314	3.320	0.001	Significant (+)
Product diversity perception → customer loyalty	0.214	2.166	0.033	Significant (+)
Simultaneous effect (F = 32.127)	—	—	< 0.001	Significant

Source: Summary of Tables II and III.

E. Discussion

The effect of price perception on customer loyalty. Price perception (X_1) has a positive effect on customer loyalty (Y), which is statistically significant as shown by the significance value of 0.002, below 0.05, based on the multiple linear regression and significance tests. The theoretical implication is in line with the value-for-money concept in the marketing literature, in which customers consider not only the nominal price but also compare it with the benefits received (Januari & Subagyo, 2024). This is highly relevant to Nahdiana Printing, whose customers are dominated by small business actors and institutions with limited budgets, so the fit between price and print quality is a main consideration in repurchase decisions. The finding explains why price perception is significant at this research object: printing customers tend to be loyal when they feel the price paid is commensurate with the quality of the printed output, not merely because the price is cheap. The practical implication is that management of Nahdiana Printing needs a transparent and competitive pricing strategy, ensuring that the prices offered match print quality and the value perceived by customers (Iswanti et al., 2023).

The result is consistent with Saraswati and Indriani (2021), who found that price perception has a positive and significant partial effect on customer loyalty.

The effect of service quality perception on customer loyalty. Service quality perception (X2) has a positive and significant effect on customer loyalty (Y), with a significance value of $0.001 < 0.05$. The theoretical implication refers to the service quality concept of Kotler and Keller, who define it as the capacity of an organization to meet consumers' expectations through the service provided. Service quality is the most dominant variable in this study (Beta = 0.314). This can be explained by field conditions: Nahdiana Printing serves customers who need punctuality and high accuracy of print results, such as wedding invitations, event banners, and business documents, so a single bad experience of delay or printing error easily pushes customers to switch to another printer. Service quality therefore has a stronger loyalty-binding power than price or product diversity. Fast, accurate, friendly service that responds to complaints builds trust, which in turn encourages repeat purchases (Widiastuti, 2024). The practical implication is that management must keep improving service quality to retain and increase customer loyalty: ensuring that service is fast and on time, improving staff friendliness and communication skills, and reducing errors in the printing process. The company also needs to be more responsive in handling complaints so that customers feel cared for and appreciated. With maximal improvement in service quality, customers are expected to be satisfied, reorder, and recommend Nahdiana Printing Ketanggungan to others. The result is in line with Lonan et al. (2023), whose study of price perception, product quality, and product diversity on consumer loyalty through the Tokopedia application indicates that service quality has a positive and significant effect on customer loyalty; the higher the service quality a company provides, the stronger customer loyalty becomes.

The effect of product diversity perception on customer loyalty. Product diversity perception (X3) has a positive and significant effect on customer loyalty (Y), with a significance value of $0.033 < 0.05$. The theoretical implication relates to product diversity as a dimension of offering management in service businesses: product diversity reflects a company's ability to provide choices that meet various customer needs in one place (Anggi Wardani & Kustami, 2023). At Nahdiana Printing, the finding can be explained by the fact that customers have varied needs, from printing invitations, banners, and brochures to office stationery. When all these needs can be met in one place with varied choices of material, size, and design, customers need not look for another printer, so loyalty increases. Conversely, limited product variety pushes customers to seek alternatives from competing printers that offer more choices. The practical implication is that management needs to diversify its products and services proactively. Operational steps include enriching print material options such as art paper, vinyl, and canvas; widening the variety of dimensions and print formats; providing graphic design services for customers without print-ready files; and adding product lines such as promotional merchandise and printed souvenirs. By broadening its portfolio, Nahdiana Printing can become a one-stop printing solution, reducing customers' reasons to switch and directly strengthening their loyalty (Taher et al., 2025).

The simultaneous effect of the three variables on customer loyalty. The multiple linear regression and simultaneous (F) test show a significant joint effect of price perception (X1), service quality perception (X2), and product diversity perception (X3) on customer loyalty at Nahdiana Printing Ketanggungan, with a significance value of $< 0.001 < 0.05$. The theoretical implication reinforces a holistic approach in marketing management: customer loyalty cannot be built through a single variable but through the synergy of fair prices, satisfying service, and a complete choice of products (Hanan et al., 2026). In the context of Nahdiana Printing, the three variables complement one another: competitive prices attract new customers and encourage repeat purchases, good service quality creates positive experiences that build trust, and product diversity reduces customers' need to look for another printer. This synergistic interaction explains why, together, the three variables explain 48.5% of the variation in customer loyalty. The finding is supported by earlier studies by Gunistiyo (2023), Prabowo et al. (2024), and Utama et al. (2024), who found that price perception, service quality, and product diversity jointly have a positive and significant effect on customer loyalty. The practical implication is that Nahdiana Printing needs a series of strategic actions to strengthen customer loyalty. First, it should set a price structure commensurate with print quality and the benefits received, so that prices are perceived as fair and competitive. Second, service quality should be improved through process speed, punctual completion, friendliness, effective communication, and responsiveness to complaints. Third, it should widen product variety in type, materials, print sizes, designs, and customization options to meet customer needs more fully. If all three aspects are improved simultaneously, customers are expected to feel higher satisfaction, repurchase, and recommend Nahdiana Printing to others, ultimately strengthening customer loyalty.

IV. CONCLUSIONS

This study shows that price perception, service quality perception, and product diversity perception have a positive and significant effect on customer loyalty at Nahdiana Printing Ketanggungan, Brebes Regency, both partially and

simultaneously. Among the three variables, service quality is the most dominant factor, which indicates that customer satisfaction in service interactions, especially speed, accuracy, and responsiveness to complaints, is the main determinant of loyalty in printing businesses. Together, the three variables explain 48.5% of the total variation in customer loyalty. The findings imply that the management of customer loyalty in a local-scale printing business should combine the three dimensions synergistically. The study also enriches understanding of consumer behavior in the context of printing services and can serve as a basis for Nahdiana Printing's management in formulating decision-making strategies, particularly in designing more effective customer retention programs.

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