

The Mediating Role of Customer Data Analytics in the Effects of Customer Relationship Management and Personalized Marketing on Cross-Selling in Retail Jaringan Solution, Pematangsiantar City

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ABSTRACT

This study aims to analyze the effects of Customer Relationship Management (CRM), Personalized Marketing, and Customer Data Analytics on Cross-Selling at Retail Jaringan Solution in Pematangsiantar City. This research employed an explanatory quantitative approach involving 128 customers as respondents, determined using the Slovin formula. Data were collected through questionnaires and analyzed using multiple linear regression and mediation analysis. The results show that CRM, Personalized Marketing, and Customer Data Analytics have positive and significant effects on Cross-Selling. The regression coefficients were 0.284 for CRM, 0.173 for Personalized Marketing, and 0.471 for Customer Data Analytics. The regression model explained 71.1% of the variation in Cross-Selling ($R^2 = 0.711$), while 28.9% was explained by other factors. The F-test confirmed significant simultaneous effects, while the t-test indicated that all individual relationships were statistically significant. These findings highlight the importance of effective customer relationship management, personalized marketing strategies, and customer data utilization in increasing cross-selling performance

INTRODUCTION

In facing increasingly intense business competition, companies need to develop marketing strategies that are not only oriented toward acquiring new customers but also toward increasing the transaction value of existing customers. One strategy that can be implemented is cross selling, which refers to the effort to offer additional products that are relevant to customers' needs or to products they have previously purchased. Cross selling enables companies to leverage established customer relationships to expand the range of products purchased by customers. (Kamakura, 2008) explains that cross selling is one of the strategies for developing customer relationships by increasing the value of customer relationships through the expansion of products or services used by customers. Therefore, the success of cross selling depends not only on product availability but also on the company's ability to identify the right products, target the right customers, and determine the appropriate timing for making offers.

At Retail Jaringan Solution, the implementation of cross selling is important due to the company's business characteristics as a distributor that provides various food and staple products to business customers. The diversity of products available provides opportunities for the company to offer complementary products based on customers' characteristics and purchasing patterns. However, the implementation of cross selling still faces several challenges, particularly in determining the appropriate timing of offers according to customer needs and in communicating the value or benefits of additional products effectively. These conditions indicate that the company needs a better understanding of customer characteristics, needs, and purchasing patterns as a basis for developing more targeted cross selling strategies. (Li, Shibo and Sun, Baohong and Montgomery, 2011), explain that the effectiveness of cross selling campaigns is related to a company's ability to understand changes in customer needs and adjust its offers according to customer characteristics and appropriate timing.

One factor that can support the effectiveness of cross selling is Customer Data Analytics. The increasing availability of customer data enables companies to analyze purchasing behavior, identify customer needs, predict demand, and generate information that can support marketing decision making. (Wedel & Kannan, 2016) explain that the development of marketing analytics enables companies to utilize large volumes of data to generate customer insights and support more effective marketing decisions. The use of analytics also enables companies to understand customer behavioral patterns more comprehensively, allowing marketing decisions to be based on more relevant and accurate information. In its implementation, Retail Jaringan Solution has utilized customer data and digital systems to support transaction activities, customer data management, inventory management, and operational activities. However, the utilization of such data still needs to be optimized, particularly in generating information that can be used to predict customer needs and determine marketing actions more proactively. This condition highlights the importance of more effective customer data management and analysis so that available information can be utilized as a basis for increasing cross selling opportunities. (Buhalis &

Volchek, 2021) explain that data driven analytical capabilities are important for understanding customer interactions and allocating marketing value more accurately. Thus, Customer Data Analytics can be viewed as the company's capability to transform customer data into meaningful information that supports marketing decision making.

In addition to Customer Data Analytics, the implementation of Customer Relationship Management is also an important factor in supporting the utilization of customer data. Customer Relationship Management enables companies to manage customer information, understand customer needs, and develop sustainable relationships through the integration of people, technology, processes, and organizational culture. (Kumar, V. and Reinartz, 2018) explain that customer relationship management involves the process through which companies manage customer relationships to create and sustain customer value. Effective customer relationship management enables companies to gain a better understanding of customer characteristics, needs, and behaviors, which can subsequently be utilized to support marketing activities.

At Retail Jaringan Solution, customer relationship management has become part of the company's business activities. Nevertheless, several aspects still need to be improved, particularly the consistency of employee service in responding to customer needs and the effectiveness of several operational processes that are still performed manually. These conditions may affect the company's ability to manage customer information and relationships optimally. Therefore, strengthening Customer Relationship Management is necessary to support the effective utilization of customer data in marketing activities. In this context, CRM does not merely function as a means of maintaining customer relationships but can also serve as a foundation for obtaining and managing customer information required for marketing decision making.

Another important factor is Personalized Marketing, which refers to a marketing approach that adapts offers to the characteristics, needs, location, and relevant timing of individual customers. This approach enables companies to provide more relevant offers so that customers do not receive standardized marketing messages but rather offers that are more closely aligned with their individual needs and circumstances. (Bleier et al, 2019) explain that the effectiveness of personalization in digital marketing is influenced by the relevance of information provided to customers and how customers respond to personalized experiences. Therefore, personalization can help companies improve the relevance of marketing communication and offers when it is supported by adequate customer information. At Retail Jaringan Solution, the implementation of customer oriented marketing still needs to be further developed, particularly in determining the appropriate timing of offers and adapting offers to individual customer needs. Offers that are not fully adjusted to individual customer circumstances may reduce the relevance of the marketing information provided. In this context, Personalized Marketing requires accurate customer information to enable companies to determine appropriate products and offers. This is consistent with studies indicating that personalized marketing

recommendation systems can provide relevant product recommendations and support cross selling strategies.

Based on these conditions, Customer Data Analytics has an important position as a variable that connects a company's ability to manage customer relationships and implement personalized marketing with efforts to improve cross selling. Customer Relationship Management and Personalized Marketing can generate and enrich information about customers, while Customer Data Analytics enables such information to be processed into actionable insights that can be used to determine more appropriate products, timing, and approaches for customer offers. Therefore, a company's ability to analyze customer data can serve as a mechanism that bridges customer relationship management and marketing personalization with the creation of cross selling opportunities.

The relationship between customer data utilization and cross selling is also supported by research on database marketing, which indicates that customer transaction data can be utilized to identify customers who are likely to be interested in particular products, thereby enabling companies to determine cross selling opportunities more accurately. This indicates that customer data serves not merely an administrative function but can also become a strategic source of information for determining target customers, developing relevant offers, and strengthening customer relationships. Therefore, research on Customer Relationship Management, Personalized Marketing, Customer Data Analytics, and Cross Selling is important to conduct at Retail Jaringan Solution. This study aims to provide empirical evidence regarding the effects of Customer Relationship Management and Personalized Marketing on Cross Selling, both directly and indirectly through Customer Data Analytics as a mediating variable.

LITERATURE REVIEW

Customer Relationship Management

Customer Relationship Management (CRM) represents the extent to which a company is able to effectively manage and develop relationships with customers to establish long term relationships and improve customer performance. CRM not only reflects a company's ability to interact with customers but also encompasses its ability to manage customer information, utilize technology and data, develop human resources, and implement business processes that support the creation of effective customer relationships. In the retail business context, CRM is considered an important approach for improving the effectiveness of customer management, as it enables companies to understand customer needs and behavior and develop more appropriate marketing strategies. In practice, CRM can be implemented through various activities aimed at managing customer interactions and relationships on an ongoing basis.

According to (Hidaka et al., 2018), CRM activities in the retail business are associated with customer performance. Effective CRM enables companies to manage various customer-related activities in a more integrated manner, thereby improving relationship quality and customer performance. Therefore, the implementation of CRM is essential for retail companies to retain customers,

understand their needs, and create opportunities to increase transaction value through various marketing activities, including cross selling. Accordingly, CRM not only plays a role in building and maintaining customer relationships but can also serve as a supporting factor in the utilization of customer data analytics and the improvement of cross selling effectiveness.

Personalized Marketing

Personalized Marketing represents the extent to which a company develops marketing activities tailored to individual customer needs, preferences, and behaviors to establish relevant and longterm customer relationships. It involves the utilization of customer information, technology, and data to provide more targeted products, services, and promotional offers. In the retail business context, personalized marketing enables companies to better understand customer preferences and develop marketing strategies that are more relevant to customer needs. According to (Na et al., 2025), personalized marketing enables companies to utilize customer information to develop relevant marketing activities and strengthen customer responses. Therefore, personalized marketing can support retail companies in increasing transaction value through relevant marketing activities, including cross selling, while also supporting the utilization of customer data analytics to improve marketing effectiveness.

Customer Data Analytics

Customer Data Analytics represents the extent to which a company is able to collect, process, analyze, and utilize customer data to understand customer needs, preferences, and purchasing behavior. Customer data analytics not only involves the use of data and technology but also supports companies in developing more accurate and relevant marketing strategies. In the retail business context, customer data analytics is considered an important approach because it enables companies to gain deeper insights into customer behavior and improve the effectiveness of marketing activities. In practice, customer data analytics can be utilized to identify customer patterns, preferences, and purchasing opportunities. According to Yap and (Sharma, 2020), customer data analytics enables companies to transform customer data into valuable insights that support more effective decision making. Therefore, the implementation of customer data analytics is important for retail companies to understand customer needs, develop relevant offers, and create opportunities to increase transaction value through marketing activities, including cross selling. Accordingly, customer data analytics can contribute to improving the effectiveness of cross selling by enabling companies to identify complementary products that are relevant to individual customer needs.

Cross Selling

Cross Selling represents the extent to which a company is able to offer complementary or additional products that are relevant to customers' needs and purchasing behavior to increase transaction value and strengthen customer relationships. Cross selling not only reflects a company's ability to offer additional products but also involves understanding customer preferences, purchasing patterns, and product relevance. In the retail business context, cross selling is considered an important marketing strategy because it enables

companies to increase transaction value while providing customers with products that complement their primary purchases. In practice, cross selling can be implemented by identifying customer purchasing patterns and offering relevant complementary products. According to (Yap & Koh, 2025), the utilization of customer information and analytical insights can support companies in identifying suitable opportunities to offer additional products to customers. Therefore, effective cross selling is important for retail companies to increase transaction value, meet customer needs, and strengthen customer relationships. Accordingly, cross selling can be enhanced through the effective utilization of customer information and data to identify relevant products and develop more targeted marketing offers.

Relationship Between Customer Relationship Management, Personalized Marketing, Customer Data Analytics, and Cross Selling

Cross selling is influenced by the interaction of customer relationship management, personalized marketing, and customer data analytics, which enable companies to better understand customer needs, preferences, and purchasing behavior. Customer Relationship Management (CRM) helps companies manage customer interactions and information systematically, thereby supporting the development of stronger and long term customer relationships. Personalized marketing complements these efforts by utilizing customer information to provide products, services, and promotional offers that are more relevant to individual customer characteristics and preferences. Customer Data Analytics further strengthens these activities by enabling companies to collect, process, analyze, and utilize customer data to generate insights that support more effective marketing decisions. (Yanamandram & Hossain, 2020) explain that customer analytics capability in retailing involves data management, personalization, communication, and offering capabilities that enable retailers to create greater customer value.

These insights can subsequently be used to identify customer purchasing patterns and relevant complementary products, thereby creating opportunities for cross selling. Research by (Dahana et al., 2019) indicates that cross buying across product categories can influence customers' purchase behavior and spending, highlighting the importance of encouraging customers to purchase additional products. Therefore, Customer Data Analytics is positioned as a mediating variable that connects Customer Relationship Management and Personalized Marketing with Cross Selling by transforming customer information and marketing activities into actionable insights. Accordingly, this study proposes that Customer Relationship Management and Personalized Marketing influence Cross Selling both directly and indirectly through Customer Data Analytics as a mediating variable.

RESEARH METHOD

This study employed a quantitative explanatory research design to examine the effects of Customer Relationship Management (X_1) and Personalized Marketing (X_2) on Cross Selling (Y), with Customer Data Analytics (Z) as a mediating variable. The study involved 128 customers of Retail Jaringan Solution, with the sample size determined using the Slovin formula. Primary

data were collected through a structured questionnaire using a five-point Likert scale (Creswell & Creswell, 2018); (Taherdoost, 2016); (Taherdoost, 2017). The research instrument was tested for validity and reliability. Validity was assessed using corrected item-total correlation, with values above 0.30 considered acceptable, while reliability was measured using Cronbach's Alpha, with values above 0.70 indicating satisfactory internal consistency (Taherdoost, 2017)

Data were analyzed using IBM SPSS Statistics through multiple linear regression and mediation analysis. Two regression models were applied: $Z = \beta_1 X_1 + \beta_2 X_2 + e_1$ to examine the effects of X_1 and X_2 on Z , and $Y = \beta_4 X_1 + \beta_5 X_2 + \beta_3 Z + e_2$ to examine their effects on Y . The analysis included R^2 , F-test, and t-test to assess model explanatory power, simultaneous effects, and partial effects. Mediation analysis examined the direct and indirect effects of X_1 and X_2 on Y through Z (Hayes & Rockwood, 2017), following the approaches of (Suliyanto, 2018) and (Hayes, 2018)

RESULTS

Respondent Characteristics

Table 1. Characteristics of the Research Respondents

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	77	60,16
	Female	51	39,84
Age	< 20 years old	8	6,25
	21-30 years old	32	25
	31-40 years old	58	45,31
	41-50 years old	30	23,44
Length of Time as a Customer	< 6 Months	0	0
	6 month - 1 years	25	19,53
	1-2 years	44	34,37
	>2 years	59	46,09
Based on Shopping Frequency	1 time	7	5,46
	2-5 times	53	41,40
	>5 times	68	53,14
Through Which Media Do Customers Receive Information	WhatsApp/SMS	60	46,87
	Email	0	0
	Mobile Application / Website	10	7,81
	Directly in the Store (Sales Staff)	58	45,31

Source: Results of questionnaire data processing (2026)

The study involved 128 customers as respondents, all of whom participated in completing the research questionnaire. Table 1 presents the characteristics of the respondents based on gender, age, length of customer relationship, shopping frequency, and the media used to receive information. In terms of gender, male respondents constituted the majority, with 77 respondents (60.16%), while female respondents accounted for 51 respondents (39.84%). This composition indicates that male customers represented a larger proportion of the respondents in this study.

Regarding age, respondents aged 31–40 years constituted the largest group, comprising 58 respondents (45.31%). This was followed by respondents aged 21–30 years, with 32 respondents (25.00%), respondents aged 41–50 years, with 30 respondents (23.44%), and respondents aged below 20 years, with 8 respondents (6.25%). The distribution indicates that most respondents were within the productive age range, particularly those aged 31–40 years. In terms of length of customer relationship, none of the respondents had been customers for less than six months, representing 0 respondents (0%). A total of 25 respondents (19.53%) had been customers for 6 months to 1 year, while 44 respondents (34.37%) had maintained a customer relationship for 1–2 years. The largest group consisted of customers who had been with the company for more than 2 years, accounting for 59 respondents (46.09%). This finding indicates that most respondents had maintained relatively long term relationships with the company.

Regarding shopping frequency, 7 respondents (5.46%) reported making purchases once, while 53 respondents (41.40%) reported making purchases 2–5 times. The largest group consisted of respondents who made purchases more than 5 times, totaling 68 respondents (53.14%). This finding suggests that most respondents had relatively high purchase frequencies and, therefore, sufficient experience in interacting and conducting transactions with the company. In terms of the media used to receive information, the majority of respondents received information through WhatsApp/SMS, accounting for 60 respondents (46.87%). This was followed by direct communication at the store through sales staff, used by 58 respondents (45.31%). Meanwhile, 10 respondents (7.81%) received information through mobile applications/websites, while none received information through email, representing 0 respondents (0%). These findings indicate that WhatsApp/SMS and direct communication through sales staff were the primary channels used to deliver information to customers.

Validity Test

Table 2. Validity Test

Variable	Number of Items	Range of Correlation Coefficient	Cut off Value	Conclusion
Customer Relationship Management (X_1)	15	0.658 – 0.838	≥ 0.30	Valid
Personalized Marketing (X_2)	9	0.640 – 0,782	≥ 0.30	Valid

Variable	Number of Items	Range of Correlation Coefficient	Cut off Value	Conclusion
Customer Data Analytics (Z)	15	0.645 – 0.859	≥ 0.30	Valid
Cross Selling (Y)	12	0.663 – 0.877	≥ 0.30	Valid

Source: Data processing results using SPSS (2026).

Validity assessment was conducted to determine whether each questionnaire item adequately represented the construct being measured. A corrected item total correlation coefficient of 0.30 was established as the minimum acceptable criterion for assessing item validity. As presented in Table 2, all measurement items met the specified criterion. The Customer Relationship Management scale produced correlation coefficients ranging from 0.658 to 0.838, while the Personalized Marketing scale ranged from 0.640 to 0.782. The Customer Data Analytics scale yielded coefficients ranging from 0.645 to 0.859, whereas the Cross Selling scale ranged from 0.663 to 0.877. Since all coefficients exceeded the predetermined cut off value, all questionnaire items were considered valid and retained for subsequent statistical analysis.

Reability Test

Table 3. Reability Test

Variable	Number of Items	Cronbach's Alpha Range	Cronbach's Alpha Standard	Conclusion
Customer Relationship Management (X_1)	15	0.869 – 0.870	≥ 0.70	Reliable
Personalized Marketing (X_2)	9	0.869 – 0.871	≥ 0.70	Reliable
Customer Data Analytics (Z)	15	0.869 – 0.870	≥ 0.70	Reliable
Cross Selling(Y)	12	0.869 – 0.870	≥ 0.70	Reliable

Source: Data processing results using SPSS (2026).

Internal consistency was assessed using Cronbach's Alpha to determine the reliability of each measurement scale. An Alpha coefficient greater than 0.70 indicates that an instrument consistently measures the intended construct. The reliability analysis results showed that all variables exceeded the recommended threshold. The Cronbach's Alpha values ranged from 0.869 to 0.870 for Customer Relationship Management, 0.869 to 0.871 for Personalized Marketing, 0.869 to 0.870 for Customer Data Analytics, and 0.869 to 0.870 for Cross Selling. These results indicate excellent internal consistency, confirming that the research instrument demonstrated adequate reliability for subsequent hypothesis testing.

Multiple Linear Regression AnalysisTable 4. Multiple Linear Regression
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
(Constant)	6.528	3.044	
1 Customer Relationship Management	.335	.070	.328
Personalized Marketing	.960	.117	.562

Dependent Variable: Customer Data Analytics

Based on the data analysis presented in Table 4, the regression coefficients were obtained as $\beta_1 = 0.328$ and $\beta_2 = 0.562$, with $e_1 = \sqrt{(1 - 0.666)} = 0.578$. Accordingly, the resulting regression equation is: $Z = 0.328X_1 + 0.562X_2 + 0.578$. The regression equation indicates that Customer Relationship Management (X_1) and Personalized Marketing (X_2) have positive effects on Customer Data Analytics (Z). Assuming that other variables remain constant, a one unit increase in Customer Relationship Management is associated with an increase of 0.328 units in Customer Data Analytics. Similarly, a one unit increase in Personalized Marketing is associated with an increase of 0.562 units in Customer Data Analytics. Based on the regression coefficients, Personalized Marketing has a larger regression coefficient than Customer Relationship Management, indicating a relatively greater contribution to Customer Data Analytics. Therefore, it can be concluded that Customer Relationship Management and Personalized Marketing have positive effects on Customer Data Analytics at Retail Jaringan Solution.

Table 5. Multiple Linear Regression
Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
(Constant)	4.543	2.247	
1 Customer Relationship Management	.225	.055	.284
Personalized Marketing	.229	.105	.173
Customer Data Analytics	.366	0,65	.471

Dependent Variable: Cross Selling

Based on the data analysis presented in Table 5, the regression coefficients were obtained as $\beta_4 = 0.284$, $\beta_5 = 0.173$, and $\beta_3 = 0.471$, with $e_2 = \sqrt{(1 - 0.711)} = 0.538$. Accordingly, the resulting regression equation is: $\hat{Y} = 0.284X_1 + 0.173X_2 + 0.471Z + e_2$. The regression equation indicates that Customer Relationship Management (X_1), Personalized Marketing (X_2), and Customer Data Analytics (Z) have positive effects on Cross Selling (Y). Assuming that other variables remain

constant, a one unit increase in Customer Relationship Management is associated with an increase of 0.284 units in Cross Selling. Similarly, a one unit increase in Personalized Marketing is associated with an increase of 0.173 units in Cross Selling. Furthermore, a one unit increase in Customer Data Analytics is associated with an increase of 0.471 units in Cross Selling.

Based on the regression coefficients, Customer Data Analytics has the largest coefficient (0.471) compared with Customer Relationship Management (0.284) and Personalized Marketing (0.173). This finding indicates that Customer Data Analytics makes the largest relative contribution to Cross Selling within the proposed model. Therefore, it can be concluded that Customer Relationship Management, Personalized Marketing, and Customer Data Analytics have positive effects on Cross Selling at Retail Jaringan Solution.

Simultaneous Effect (F-Test)

Table 6. Simultaneous Effect (F-Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4890.986	2	2445.493	121.433	.000^b
1 Residual	2456.631	125	19.653		
Total	7347.617	127			

Dependent Variable: Customer Data Analytics

Predictors: (Constant), Customer Relationship Management , Personalized Marketing

The simultaneous significance test was conducted to determine whether the independent variables jointly explained the variation in Customer Data Analytics. The ANOVA results showed an F-statistic of 121.433 with a significance value of 0.000, which is below the 0.05 significance level. Therefore, the regression model was statistically significant, indicating that Customer Relationship Management and Personalized Marketing jointly have significant effects on Customer Data Analytics. These findings support the proposed research model and confirm that the two independent variables jointly contribute to explaining variations in Customer Data Analytics.

Table 7. Simultaneous Effect (F-Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3144.386	3	1048.129	101.504	.000^b
1 Residual	1280.418	124	10.326		
Total	4424.805	127			

Dependent Variable: Cross Selling

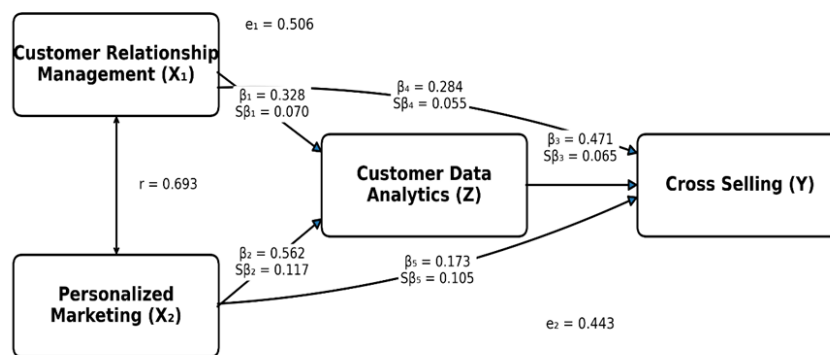
Predictors: (Constant), Customer Relationship Management, Personalized Marketing, Customer Data Analytics

The simultaneous significance test was conducted to determine whether the independent variables jointly explain the variation in Cross Selling. The ANOVA results showed an F statistic of 101.504 with a significance value of

0.000, which is lower than the 0.05 significance level. Therefore, the regression model was statistically significant, indicating that Customer Relationship Management, Personalized Marketing, and Customer Data Analytics jointly have significant effects on Cross Selling. These findings support the proposed research model and confirm that the three independent variables jointly contribute to explaining variations in Cross Selling at Retail Jaringan Solution.

Sobel Test

The Sobel test was conducted to determine whether Customer Data Analytics significantly mediates the relationship between the independent variables and Cross Selling. The mediation effect was assessed by comparing the calculated t -value with the critical t -value at a significance level of 0.05. A mediation effect is considered significant when the calculated t -value exceeds the critical t -value.



Source: data processing results (2026)

Figure 1. Path Analysis Diagram

The Mediating Effect of Customer Data Analytics on the Relationship between Customer Relationship Management and Cross Selling

The Sobel test results indicate a calculated t -value of 3.909, which is greater than the critical t -value of 1.996. Therefore, H_0 is rejected and H_4 is accepted, indicating that Customer Data Analytics significantly mediates the relationship between Customer Relationship Management and Cross Selling. The direct effect of Customer Relationship Management on Cross Selling is 0.284, while the indirect effect through Customer Data Analytics is calculated as $\beta_1 \times \beta_3 = 0.328 \times 0.471 = 0.154$. Thus, the total effect is $0.284 + 0.154 = 0.438$. These results indicate that Customer Relationship Management influences Cross Selling both directly and indirectly through Customer Data Analytics. Effective management of customer relationships provides customer information that can be analyzed and utilized to identify customer needs and appropriate complementary products, thereby increasing Cross Selling opportunities. This finding confirms that Customer Data Analytics plays a significant mediating role in the relationship between Customer Relationship Management and Cross Selling.

The Mediating Effect of Customer Data Analytics on the Relationship between Personalized Marketing and Cross Selling

The Sobel test was conducted to determine whether Customer Data Analytics significantly mediates the relationship between Personalized

Marketing and Cross Selling. The calculated t -value was **3.978**, which is greater than the critical t -value of **1.996** at a significance level of 0.05. Therefore, H_0 is rejected and H_1 is accepted, indicating that Customer Data Analytics significantly mediates the relationship between Personalized Marketing and Cross Selling. The direct effect of Personalized Marketing on Cross Selling is **0.173**, while the indirect effect through Customer Data Analytics is calculated as $\beta_2 \times \beta_3 = 0.562 \times 0.471 = 0.265$. Thus, the total effect is **0.173 + 0.265 = 0.438**. These findings indicate that Personalized Marketing affects Cross Selling both directly and indirectly through Customer Data Analytics. Effective personalization enables the company to utilize customer data to better understand customer needs, preferences, and purchasing patterns, thereby supporting more relevant complementary product offerings. Overall, the results confirm that Customer Data Analytics plays a significant mediating role in the relationship between Personalized Marketing and Cross Selling.

Coefficient of Determination

Table 8. Coefficient of Determination (R^2)

Model Summary

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	.816 ^a	.666	.660	4.43318

Predictors: (Constant), Customer Relationship Management, Personalized Marketing,
Dependent Variabel : Dustomer Data Analytics

The explanatory power of the regression model was evaluated using the coefficient of determination (R^2). The analysis showed an R value of 0.816, indicating a strong relationship between the independent variables and Customer Data Analytics. Furthermore, the R Square value of 0.666 indicates that 66.6% of the variance in Customer Data Analytics can be explained by Customer Relationship Management and Personalized Marketing. The remaining 33.4% is attributable to other factors outside the scope of this study. The Adjusted R Square value of 0.666 further indicates that, after accounting for the number of predictors included in the model, the independent variables continue to explain a substantial proportion of the variance in Customer Data Analytics. These findings indicate that the regression model has adequate explanatory power in explaining the phenomenon under investigation.

Table 9. Coefficient of Determination (R^2)

Model Summary

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	.843 ^a	.711	.704	3.21340

Predictors: (Constant), Customer Relationship Management, Personalized Marketing,
Customer Data Analytics

Dependent Variabel : Cross Selling

The explanatory power of the regression model was evaluated using the coefficient of determination (R^2). The analysis showed an R value of 0.843, indicating a strong relationship between the independent variables and Cross Selling. Furthermore, the R Square value of 0.711 indicates that 71.1% of the variance in Cross Selling can be explained by Customer Relationship Management, Personalized Marketing, and Customer Data Analytics. The remaining 28.9% is attributable to other factors outside the scope of this study. The Adjusted R Square value of 0.711 further indicates that, after accounting for the number of predictors included in the model, the independent variables continue to explain a substantial proportion of the variance in Cross Selling. These findings indicate that the regression model has adequate explanatory power in explaining the phenomenon under investigation.

DISCUSSION

The findings indicate that Cross Selling at Retail Jaringan Solution is influenced by Customer Relationship Management, Personalized Marketing, and Customer Data Analytics. The results suggest that strengthening customer relationship management, implementing personalized marketing, and effectively utilizing customer data can enhance Cross Selling. Therefore, an integrated marketing approach is needed rather than relying on a single strategy. Furthermore, Customer Data Analytics mediates the effects of Customer Relationship Management and Personalized Marketing on Cross Selling. This finding indicates that customers oriented strategies become more effective when supported by the ability to collect, analyze, and utilize customer data. Thus, Customer Relationship Management, Personalized Marketing, and Customer Data Analytics play important strategic roles in improving Cross Selling at Retail Jaringan Solution.

Customer Relationship Management, Customer Data Analytics and Cross Selling

The positive regression coefficient of Customer Relationship Management indicates that effective customer relationship management can enhance Cross Selling. Customer Relationship Management enables companies to understand customer characteristics, transaction histories, and needs, allowing additional product offerings to be delivered more appropriately. In the context of Retail Jaringan Solution, well managed customer relationships can create opportunities to offer complementary products based on customers' purchasing patterns. Furthermore, Customer Data Analytics serves as a mediating variable that strengthens the relationship between Customer Relationship Management and Cross Selling. By collecting, processing, and analyzing customer data, companies can identify purchasing patterns and predict products that customers are likely to purchase. (Wagner et al., 2018) demonstrated that enriched customer data can be utilized in analytical Customer Relationship Management to predict cross selling opportunities. Similarly, (Bapna & Ramsey, 2016) found that information contained in Customer Relationship Management systems can be used to identify customers who are likely to respond to cross selling campaigns.

Personalized Marketing, Customer Data Analytics, and Cross Selling

The positive regression coefficient of Personalized Marketing indicates that marketing strategies tailored to customer needs and preferences can enhance Cross Selling. Personalized Marketing enables companies to provide more relevant product offerings based on customer characteristics, preferences, and purchasing behavior. In the context of Retail Jaringan Solution, this approach can help the company identify and offer complementary products that are more closely aligned with customers' purchasing patterns and needs. (Chandra et al., 2022) explained that personalized marketing involves tailoring marketing activities to individual customer characteristics and preferences, thereby increasing the relevance of marketing interactions and offerings. Furthermore, Customer Data Analytics serves as a mediating variable that supports the relationship between Personalized Marketing and Cross Selling. By collecting, processing, and analyzing customer data, companies can gain insights into customer behavior and preferences that support more effective personalization. (Wedel & Kannan, 2016) emphasized that marketing analytics in data rich environments enables firms to utilize customer data to support personalization and improve marketing decision making. Such analytical capabilities allow companies to identify customer patterns and develop more relevant product offerings. Therefore, the use of Customer Data Analytics can strengthen the implementation of Personalized Marketing and subsequently create greater opportunities for Cross Selling.

Customer Data Analytics and Cross Selling

The positive regression coefficient of Customer Data Analytics indicates that the effective utilization of customer data can enhance Cross Selling. Customer Data Analytics enables companies to identify purchasing patterns, preferences, and customer needs based on transaction and behavioral data. In the context of Retail Jaringan Solution, customer data analytics can help identify products that are suitable to be offered as complementary products based on customers' purchasing patterns, thereby increasing Cross Selling opportunities. Consistent with this finding, (Hallikainen, et al., 2020) found that the use of customer big data analytics can improve sales growth and customer relationship performance. The effective utilization of customer data provides more accurate insights into customer behavior and supports more informed sales decisions. Similarly, (Emrouznejad et al., 2024) demonstrated that the use of customer transaction data can improve the predictive capability of Cross Selling, as consumption patterns provide valuable information for identifying opportunities to offer additional products.

Managerial Implications

Overall, the findings indicate that improving Cross Selling at Retail Jaringan Solution requires an integrated customer management strategy. Customer Relationship Management contributes to building and maintaining strong customer relationships, while Personalized Marketing enables the company to provide more relevant offers based on customer needs and preferences. Meanwhile, Customer Data Analytics, as a mediating variable, supports the effective utilization of customer data for more accurate marketing decisions. Therefore, these three aspects should be implemented in an integrated

manner rather than independently. For Retail Jaringan Solution, practical efforts include strengthening Customer Relationship Management through systematic recording and utilization of customer transaction histories, implementing Personalized Marketing through product recommendations and additional offers based on customer characteristics and purchasing patterns, and enhancing Customer Data Analytics capabilities to identify customer needs, preferences, and potential product opportunities. These strategies are expected to improve Cross Selling effectiveness, increase the breadth of customer purchases, enhance transaction value, and strengthen long term customer relationships.

CONCLUSIONS AND RECOMMENDATIONS

This study examined the effects of Customer Relationship Management, Personalized Marketing, and Customer Data Analytics on Cross-Selling at Retail Jaringan Solution, with Customer Data Analytics serving as a mediating variable. The findings show that these three aspects positively contribute to Cross-Selling. Customer Relationship Management helps maintain strong customer relationships, while Personalized Marketing enables the company to provide relevant offers based on customer needs and preferences. Customer Data Analytics supports the processing of customer information into insights for marketing decisions and the identification of additional sales opportunities. Furthermore, Customer Relationship Management and Personalized Marketing influence Cross-Selling both directly and indirectly through Customer Data Analytics. Therefore, an integrated approach combining customer relationship management, personalized marketing, and effective data utilization is essential for improving Cross-Selling, increasing transaction value, expanding customer purchases, and strengthening long-term customer relationships.

Based on the findings, Retail Jaringan Solution should strengthen Customer Relationship Management by utilizing customer information and transaction histories to improve communication and services. The company should also implement Personalized Marketing through customer segmentation and targeted offers based on purchasing behavior, preferences, and needs. In addition, Customer Data Analytics should be optimized by improving the collection, processing, and analysis of customer data to identify purchasing patterns and additional sales opportunities. Integrating these three approaches can support more accurate marketing decisions, improve the relevance of product recommendations, and ultimately strengthen the effectiveness of Cross-Selling.

FURTHER STUDY

Although this study provides empirical evidence on the effects of Customer Relationship Management and Personalized Marketing on Cross Selling, with Customer Data Analytics as a mediating variable, several limitations should be acknowledged. The study was conducted only at Retail Jaringan Solution with a relatively limited number of respondents. Therefore, the findings should be interpreted within the specific organizational and customer context of the study. Future research is encouraged to incorporate other organizational, marketing, and customer related factors, such as Customer

Engagement, Customer Experience, Customer Trust, Digital Marketing, Customer Satisfaction, and Customer Loyalty, to provide a broader understanding of the factors influencing Cross Selling.

Future studies should also consider larger samples from different regions, retail businesses, and customer characteristics. Comparative studies across companies or regions, as well as longitudinal research, could provide more comprehensive evidence regarding the effectiveness of Customer Relationship Management, Personalized Marketing, and Customer Data Analytics in improving Cross-Selling over time.

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