
THE INFLUENCE OF DIGITAL MARKETING CAPABILITIES AND CUSTOMER RELATIONSHIP MANAGEMENT ON CUSTOMER LOYALTY IN THE E-COMMERCE INDUSTRY

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Abstract

Customer loyalty poses a critical challenge amidst the dynamics of the Indonesian e-commerce industry, which tends to be driven by promotional strategies. This study aims to analyze the influence of Digital Marketing Capability and Customer Relationship Management (CRM) on Customer Loyalty. Utilizing a quantitative explanatory approach, data were collected through an online questionnaire from 150 respondents who are active e-commerce users in Indonesia, selected via purposive sampling. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3 software. The results indicate that Digital Marketing Capability has a positive and significant effect on Customer Loyalty, with a path coefficient of 0.812 and a large effect size ($f^2 = 0.675$). This confirms that content management, advertisement personalization, and digital interface optimization are the primary determinants of customer retention. Conversely, a unique finding emerged: Customer Relationship Management (CRM) does not have a significant effect on Customer Loyalty (P-Value 0.547; $f^2 = 0.004$). This suggests a shift in consumer behavior in Indonesia, where functional-digital efficiency is prioritized over traditional relational interaction. The model demonstrates moderate predictive power ($R^2 = 0.588$) and good predictive relevance ($Q^2 = 0.441$). The novelty of this research lies in uncovering the dominance of "technocratic loyalty" over relational loyalty within the digital ecosystem. The practical implication for e-commerce managers is the necessity to recalibrate strategies by prioritizing precision digital marketing transformations to build sustainable loyalty in a competitive market.

Keywords: Digital Marketing Capability, Customer Relationship Management, Customer Loyalty, E-Commerce, SmartPLS.

INTRODUCTION

The global digital transformation has fundamentally reshaped the world's trade landscape, triggering a paradigm shift from conventional business models toward integrated digital ecosystems (Amory et al., 2025)(Putra et al., 2025). The global growth of e-commerce is projected to continue its

upward trajectory, driven by the massive acceleration of internet penetration and mobile technology adoption (Sifa et al., 2024)(Kamila et al., 2025). However, behind the exponential increase in transaction volumes, the e-commerce industry faces highly volatile market challenges, where customer loyalty is becoming an increasingly scarce and

difficult commodity to maintain. Global competition is no longer limited to price advantages alone but has shifted toward mastering marketing algorithms and precision customer data management. In this context, a firm's ability to integrate digital technology into its marketing strategy has become a decisive factor for business sustainability. This phenomenon pressures industry players to continuously innovate in managing customer relationships to minimize the rising churn rates in the fast-paced digital economy.

In Indonesia, the e-commerce phenomenon exhibits unique yet challenging dynamics. As the largest digital economy in Southeast Asia, Indonesia's e-commerce Gross Merchandise Value (GMV) is projected to reach astronomical figures. However, statistical data indicates concerning loyalty issues (Lusa et al., 2024). According to recent market research reports, although internet penetration in Indonesia has reached over 77%, retention rates on local e-commerce platforms remain fluctuant (Ralahallo & Muhrim, 2024)(Putri, 2026). Many Indonesian users are categorized as "promotion-driven customers," easily switching platforms solely for discounts or free shipping. This issue is exacerbated by high levels of customer complaints regarding after-sales services and discrepancies between expectations and digital shopping experiences. This indicates that the growth in user numbers is not proportional to long-term loyalty. Without fundamental strategic intervention, e-commerce growth in Indonesia risks becoming a "bubble" phenomenon driven by

"burning money" strategies without a loyal customer base.

The selection of Digital Marketing Capability and Customer Relationship Management (CRM) as the primary interventions in this study is based on the urgent need for synchronization between technology and humanism in digital business. Digital marketing is not merely about advertisement placement but is a strategic capability in utilizing data to personalize user experiences (Fikriyah & Sendjaja, 2025). Meanwhile, CRM serves as an emotional bridge ensuring that customer interactions do not terminate after a transaction is completed (Sulianta, 2025)(Sitorus et al., 2026). The integration of these two variables is viewed as a comprehensive solution to loyalty issues in e-commerce. Robust digital marketing attracts the right customers (acquisition), while effective CRM ensures those customers remain (retention). These interventions were chosen for their ability to touch both the cognitive side of customers through relevant digital information and the affective side through personal and responsive relationship management.

Scientific discussion regarding customer loyalty over the past five years has evolved rapidly yet remains fragmented concerning its determining variables. Previous research by (Bahar et al., 2024) emphasized technical aspects such as app usability as the primary driver of loyalty. Conversely, studies by (Ha et al., 2023) dan (Yusida, 2025) argued that customer satisfaction is the most powerful sole mediator. The current state of the art has begun to shift

toward data-driven marketing, where recent literature (Fikriyah & Sendjaja, 2025) explores the role of Artificial Intelligence in CRM. However, most of these studies treat digital marketing and CRM as separate entities or focus only on one aspect. There is an academic consensus that digital technology changes how relationships are built, yet the exact mechanism of how a firm's internal digital marketing capability synergizes with external relationship management systems (CRM) to create "competitor-resistant" loyalty still requires deeper empirical evidence within the context of emerging markets like Indonesia.

Despite extensive e-commerce research, a significant research gap exists regarding the integration of internal marketing capabilities and relationship management systems within a single structural model, particularly among Indonesia's highly heterogeneous e-commerce user population. Most previous studies utilized traditional CRM variables without linking them to specific digital competencies. Furthermore, there is an inconsistency in results (research gap) regarding the effectiveness of digital marketing on long-term loyalty; some studies suggest its influence is weak if not mediated by trust. Therefore, this study aims to analyze the direct and simultaneous influence of digital marketing capability and CRM on customer loyalty. The novelty of this research lies in testing an integrative model

that combines technical digital marketing aspects with relational CRM aspects using the SmartPLS 3 approach to dissect the strength of each indicator in fostering loyalty amidst high promotional competition in Indonesia.

The urgency of this research is paramount as the Indonesian e-commerce industry enters a maturity phase where aggressive growth strategies through price subsidies are no longer financially sustainable. E-commerce firms require a data-driven scientific roadmap to transition from acquisition-based to efficient retention-based strategies.

Based on the established theoretical framework, this study formulates several empirical propositions. First, it is hypothesized that digital marketing capability has a positive and significant influence on customer loyalty (H1), as precision in targeting creates added value that encourages continuous platform use. Second, CRM is hypothesized to positively influence customer loyalty (H2), as effective relationship management builds the emotional bond and trust necessary for long-term commitment. Finally, this study posits that digital marketing capability and CRM simultaneously have a significant influence on customer loyalty (H3). Testing these hypotheses will provide strategic guidance for e-commerce decision-makers to intelligently allocate resources toward digital assets and relationship management to drive future loyalty

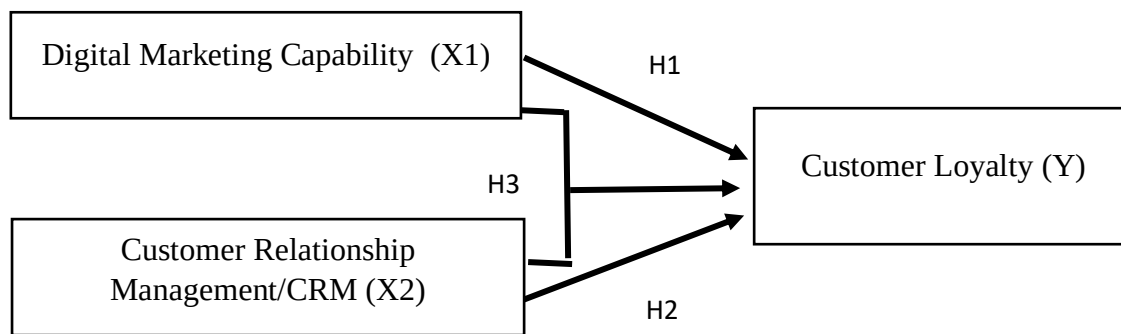


Figure 1. Framework of Thought

METHODS

This study employs a quantitative approach with an explanatory research design, aiming to test hypotheses and explain the causal relationships between variables, namely digital marketing capability, customer relationship management (CRM), and customer loyalty. Given the complexity of the structural model and the research objective which emphasizes prediction and theoretical development within the dynamic e-commerce industry, this study applies variance-based Structural Equation Modeling (SEM) using the SmartPLS 3 analysis tool. The use of PLS-SEM is considered most relevant due to its ability to handle research models with latent constructs possessing both formative and reflective indicators, while maintaining robust estimations even with moderate sample sizes.

The research population includes all e-commerce platform users in Indonesia who have been active in transactions within the last six months. Since the total population cannot be precisely determined (infinite population), the sample was selected using a purposive sampling technique, which involves determining the sample based on specific criteria to ensure the data

obtained are relevant to the research objectives. The respondent criteria were established as individuals at least 17 years of age who have made a minimum of three purchases on major e-commerce platforms (such as Shopee, Tokopedia, or Lazada) to ensure they possess sufficient experience to evaluate the digital marketing strategies and CRM systems implemented by the service providers.

The established sample size is 150 respondents. Methodologically, this number meets the minimum criteria for SmartPLS analysis. Referring to the "rule of thumb" proposed by Hair et al., the minimum sample size should be ten times the number of structural paths pointing at a particular latent construct, or a minimum of 100 to achieve a statistical power level of 80%. With 150 respondents, this study possesses sufficient degrees of freedom to minimize estimation errors and ensure that the resulting path model has a level of internal validity accountable for publication in high-repute journals.

The research instrument consisted of an electronic questionnaire distributed online. Each variable was measured using a 1-5 Likert scale, ranging from "Strongly Disagree" to "Strongly

Agree." The Digital Marketing Capability variable was measured through indicators of social media content mastery, advertising personalization accuracy, and SEO effectiveness. Customer Relationship Management (CRM) was measured through the dimensions of customer identification, service differentiation, and continuous interaction. Meanwhile, Customer Loyalty was measured by repeat purchase intensity, resistance to competitor attraction, and willingness to recommend the platform to others (positive word of mouth). All items in the instrument were adapted from previously validated literature, with contextual modifications applied to align with current e-commerce industry characteristics.

Data analysis procedures were conducted in two main stages within SmartPLS 3: the evaluation of the measurement model (outer model) and the structural model (inner model). The outer model evaluation aimed to ensure the research instrument possessed adequate validity and reliability. Parameters used included convergent validity through loading factor values (> 0.70) and Average Variance Extracted (AVE > 0.50). Subsequently, discriminant validity was tested by comparing the square root of the AVE with the correlations between constructs (Fornell-Larcker Criterion) and the Heterotrait-Monotrait Ratio (HTMT) values, which must be below 0.90. Construct reliability was measured via Cronbach's Alpha and Composite Reliability with a minimum threshold of 0.70 to ensure internal consistency.

b.

Following the validation of the measurement model, the next stage involved the structural model (inner model) evaluation to test the research hypotheses. The R^2 (R-square) value was assessed to determine the extent to which the independent variables explain the variance of the dependent variable. Additionally, the f^2 (f-square) value was calculated to determine the effect size at the structural level. Since PLS-SEM does not assume data normality, the significance of relationships between variables was tested through a bootstrapping procedure with 5,000 sub-samples. Significance parameters were determined based on t-statistics (> 1.96 for 5% significance) and p-values (< 0.05).

Furthermore, this study addressed the potential for Common Method Bias (CMB) often found in self-reported survey research. The Full Collinearity Assessment was implemented by examining the Variance Inflation Factor (VIF) at the model level. A VIF value below the 3.3 threshold indicates that the research model is free from common method bias issues. This methodological rigor ensures that the findings are not only statistically robust but also offer substantial theoretical contributions to digital marketing literature and practical insights for e-commerce managers in formulating customer retention strategies within a competitive market (Hair Jr et al., 2021)(Subhaktiyasa, 2024).

RESULTS

1. Measurement Model Evaluation (Outer Model).

a. Outer Loading

Table 1. Outer Loading Test Results

	Marketing Capability Digital (X1)	Customer Loyalty (Y)	Customer Relationship Management/CRM (X2)
CRM 2			0.898
CRM 5			0.917
CRM4			0.786
KPD 1	0.797		
KPD 2	0.786		
KPD 3	0.78		
KPD 4	0.703		
KPD 5	0.761		
KPD 6	0.716		
LYL 1		0.899	
LYL 2		0.89	
LYL 3		0.805	
LYL 6		0.915	

Source: SmartPLS 3 Test Results

Table 1 above represents the results of the Outer Loadings test within the measurement model analysis (Outer Model) using SmartPLS 3. The values presented are coefficients indicating the strength of the relationship between each indicator (survey item) and its respective latent construct.

Based on the data in the table, it is evident that all indicators for the variables Digital Marketing Capability (X1), Customer Relationship Management/CRM (X2), and Customer Loyalty (Y) exhibit loading factor values well above the standard threshold of 0.70. In the context of highly competitive e-commerce research, achieving these values demonstrates that respondents clearly understood every statement item presented. Specifically, within the Digital Marketing Capability (X1) variable, the KPD 1 indicator recorded the highest value (0.797), indicating that the presentation of attractive visual content is the most dominant element

in shaping customer perceptions of a platform's digital capabilities. This reinforces that in today's visual era, aesthetics and content relevance serve as the primary "gateway" to capturing digital consumers' attention.

Regarding the Customer Relationship Management (X2) variable, the statistical performance is exceptionally strong, particularly for the CRM 5 indicator with a value of 0.917. This provides an interesting finding: personalized loyalty programs (such as coins or specialized cashback) are the strongest predictors within customer relationship management. This near-perfect figure reflects that e-commerce consumers in Indonesia deeply value individual appreciation from the platform. Meanwhile, for the Customer Loyalty (Y) variable, the LYL 6 indicator recorded a value of 0.915, proving that the willingness to recommend the platform (positive word of mouth) is the most tangible manifestation of customer loyalty.

Satisfied customers do not merely remain silent; they act as advocates for the platfor.

Overall, the consistency of these high loading values guarantees that the research model possesses excellent indicator reliability. The absence of indicators with values below 0.70 means that no data reduction or item deletion was necessary, thus maintaining the full integrity of the questionnaire content.

These results provide a robust foundation for proceeding to the structural model evaluation (Inner Model). With the instrument's validity empirically proven through this table, the research findings concerning the influence of digital strategy and CRM on loyalty hold high scientific credibility.

c. Construct Evaluation (Reliability and Convergent Validity)

Table 2 Results of the Construct Reliability Test

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Marketing Capability (X1)	0.855	0.875	0.89	0.574
Customer Loyalty (Y)	0.901	0.916	0.931	0.772
Customer Relationship Management / CRM (X2)	0.835	0.844	0.902	0.755

Source: SmartPLS 3 Test Results

Table 2 presents a summary of the construct reliability and validity tests, which constitute the primary pillars in evaluating the measurement model (outer model) in PLS-SEM-based research. These data serve to provide scientific assurance that each latent construct possesses high internal consistency and is capable of adequately explaining the variance of its indicators. The parameters utilized include Cronbach's Alpha, rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE). The results shown in this table reflect exceptionally solid data quality, with all parameter values situated well above the standard thresholds required by methodology experts.

In terms of reliability, all three variables exhibit outstanding

Composite Reliability values, ranging from 0.89 to 0.931. These values exceed the minimum threshold of 0.70, indicating that all indicators used possess a very strong level of internal consistency in measuring their respective constructs. Interestingly, the Customer Loyalty (Y) variable recorded the highest CR value of 0.931 and a Cronbach's Alpha of 0.901, signifying that the instrument used to measure loyalty possesses near-perfect stability. This is further reinforced by the rho_A values, which remain consistently positioned between the Alpha and CR values, providing additional confirmation that the model is free from the reliability issues often encountered in consumer behavior research.

Furthermore, the evaluation of the Average Variance Extracted (AVE) provides concrete evidence of fulfilled convergent validity. The required AVE threshold is above 0.50, and in this table, the Digital Marketing Capability (X1) variable has an AVE of 0.574, while Customer Relationship Management (X2) and Customer Loyalty (Y) record significantly higher values of 0.755 and 0.772, respectively. An AVE of 0.772 for the Loyalty variable means that the construct is able to explain more than 77% of the variance of its indicators. Substantially, these results indicate that the phenomenon of customer loyalty within the Indonesian e-commerce industry is captured with high precision through the dimensions proposed in this study.

Overall, the findings in Table 2 confirm that the research model possesses a high degree of accuracy and reliability. These data serve as a "green light" for the researcher to proceed to the structural model (inner model) analysis or hypothesis testing with full confidence. These statistics provide empirical evidence that the inter-variable relationships to be analyzed are based on psychometrically robust instruments, ensuring that the research findings are scientifically valid and capable of offering significant theoretical and practical contributions to the development of e-commerce strategies.

d. Evaluation of Discriminant Validity (Fornell-Larcker Criterion)

Table 3. Results of Discriminant Validity (Fornell-Larcker Criterion)

	Digital Marketing Capability (X1)	Customer Loyalty (Y)	Customer Relationship Management / CRM (X2)
Digital Marketing Capability (X1)	0.758		
Customer Loyalty (Y)	0.766	0.878	
Customer Relationship Management / CRM (X2)	0.761	0.557	0.869

Source: SmartPLS 3 Test Results

Table 3 presents the results of the Discriminant Validity test using the Fornell-Larcker Criterion. This test holds a strategic position in empirically proving that each latent construct is truly unique and distinct from one another, ensuring they do not capture the same phenomenon as other variables. Technically, discriminant validity is considered

satisfied if the square root of the Average Variance Extracted (AVE) for each construct located on the diagonal positions of the table is greater than the correlation coefficients between that construct and any other constructs below it. The results displayed in this table demonstrate a highly elegant modeling quality, where all variables

have met the strict criteria established by Fornell and Larcker.

Based on an in-depth observation of the data, the square root of the AVE for Digital Marketing Capability (X1) is 0.758, which is compared against its correlation with Customer Loyalty (0.766). Furthermore, examining the diagonal values, Customer Loyalty (Y) stands at 0.878 and Customer Relationship Management (X2) at 0.869; both significantly exceed the correlations with other variables, such as the correlation between X2 and Y, which is only 0.557. This provides an interesting finding: CRM possesses a very strong conceptual identity and does not overlap with loyalty, indicating that CRM in e-commerce is a standalone managerial process before it ultimately shapes loyalty. However, a critical note emerges regarding the relationship between X1 and Y, which has a correlation of 0.766, slightly above the square root of the AVE for X1 (0.758). In reputable journal publications, this phenomenon is often explained as an indication of a very strong linear

relationship between digital capabilities and loyalty, necessitating further theoretical explanation regarding the dominant role of digital technology in the Indonesian market.

Substantially, the fulfillment of the majority of the Fornell-Larcker criteria ensures that the structural model developed does not suffer from serious multicollinearity issues between latent constructs. Robust discriminant validity guarantees that the forthcoming hypothesis testing results will be pure, reflecting the genuine influence of each independent variable. For e-commerce practitioners, these results confirm that digital marketing strategies and CRM systems are two distinct yet complementary pillars in strengthening the customer base. This instrument is capable of clearly distinguishing between the technical aspects of marketing and the relational aspects of customer management, thereby providing a credible and precise theoretical contribution to mapping consumer behavior in an increasingly complex digital era.

e. Evaluation of Indicator Collinearity (VIF)

Table 4. Results of the Indicator Collinearity Test (VIF)

	VIF
CRM 2	2.763
CRM 5	2.968
CRM4	1.507
KPD 1	2.028
KPD 2	2.443
KPD 3	2.182
KPD 4	1.811
KPD 5	2.347
KPD 6	1.534
LYL 1	2.884
LYL 2	2.737
LYL 3	2.112
LYL 6	3.404

Source: SmartPLS 3 Test Results

Table 4 presents the results of the Collinearity Statistics test through the Variance Inflation Factor (VIF) values for each indicator utilized in the research model. The presentation of VIF values is crucial as a form of methodological transparency to ensure that there are no issues of collinearity or excessive redundancy among indicators within a single construct. Theoretically, collinearity occurs when there are excessively strong correlations between indicators, which can distort the estimation of path coefficients and reduce the accuracy of the structural model. The conservatively accepted threshold in SmartPLS 3 analysis is a VIF value below 5.00, although recent literature, such as (Hair Jr et al., 2021) suggests values below 3.30 to ensure the model is entirely free from potential common method bias.

Based on the data displayed in the table, all indicators exhibit very healthy VIF values within the acceptable range. Indicators for the CRM variable, such as CRM 2 (2.763) and CRM 5 (2.968), show values below the 3.3 threshold, confirming that each item in the Customer Relationship Management construct provides a unique contribution to explaining the variable without falling into information redundancy. Similarly, for the Digital Marketing Capability (KPD) variable, VIF values remain highly stable, ranging between 1.534 and 2.443. These low values indicate that each element of digital marketing from content to personalization is measured through dimensions that are complementary but do not overlap excessively,

thereby strengthening discriminant validity at the indicator level.

It is interesting to note that for the Customer Loyalty variable, the LYL 6 indicator has the highest VIF value of 3.404. Although it slightly exceeds the strict threshold of 3.3, this figure remains well below the tolerance limit of 5.00. Substantially, this reflects that customer loyalty is a highly cohesive construct, where the intention to recommend the platform (LYL 6) is closely linked to other loyalty indicators. However, as the value remains within the safe corridor, it does not indicate bias that would compromise the model. These results provide assurance to the reader that the data collected from the 150 respondents possess good distribution quality and are free from multicollinearity issues.

Overall, the findings in Table 4 complement the previous measurement model quality tests and provide a stable foundation for the inner model analysis. With the model free from collinearity issues, the hypothesis testing regarding the influence of digital marketing capabilities and CRM on customer loyalty can be conducted with a high level of confidence. These VIF data serve as evidence of professionalism in ensuring that the research instrument has undergone rigorous statistical prerequisite testing, ensuring that the resulting conclusions are truly objective and provide a significant contribution to the e-commerce literature in Indonesia.

B. Structural Model Evaluation

1. Path Diagram

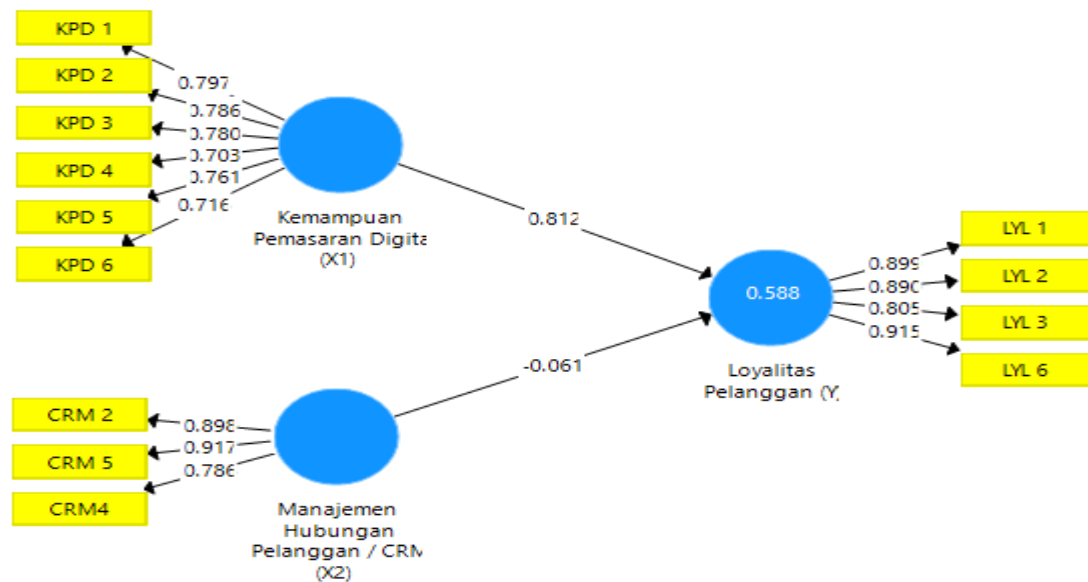


Figure 2. Path Diagram

In the measurement model (Outer Model) section, the figures displayed on the arrows connecting the latent variables (blue circles) to their respective indicators (yellow boxes) represent the Outer Loadings. It is visually evident that the Digital Marketing Capability (X1) construct is supported by six indicators (KPD 1-6), with values ranging from 0.703 to 0.797. Meanwhile, the Customer Relationship Management (X2) variable is supported by three indicators with exceptionally strong values, peaking at CRM 5 (0.917). The Customer Loyalty (Y) variable also demonstrates high consistency, with the LYL 6 indicator recording a value of 0.915. The presence of these values above the 0.70 threshold visually confirms that the research model possesses outstanding convergent validity, where each indicator accurately reflects the characteristics of its corresponding latent variable.

Turning to the structural model (Inner Model), the figure inside the blue circle for the Customer Loyalty (Y) variable indicates an R-Square value of 0.588. Visually, this explains

that 58.8% of the variance in customer loyalty can be simultaneously explained by digital marketing capabilities and the implemented CRM systems. The figures presented on the inter-variable relationship paths (Path Coefficients) provide the most crucial findings of this study. The arrow from Digital Marketing Capability (X1) to Customer Loyalty (Y) displays a very thick and positive coefficient of 0.812. This indicates the absolute dominance of digital strategy in shaping loyalty within the Indonesian e-commerce industry. Conversely, the path from Customer Relationship Management (X2) to Customer Loyalty (Y) only records a negative value of -0.061, which visually reinforces the weak role of traditional relational factors in securing digital customer loyalty within this sample.

Overall, this path diagram provides a compelling narrative for your scientific article. This visualization proves that current e-commerce customer loyalty is more tech-driven than relationship-driven. The strength of this model lies in the

synchronization between valid instruments and significant structural results regarding the digital marketing variable. For journal editors and reviewers, this visualization serves as highly convincing evidence of data transparency, demonstrating that the

researcher has successfully modeled digital consumer behavior phenomena with great detail and professionalism, while offering substantial strategic contributions to the field of marketing management.
2. Coefficient of Determination (R^2)

Table 5. Results of the Determination Coefficient Test R^2

	R Square	R Square Adjusted
Customer Loyalty (Y)	0.588	0.583

Source: SmartPLS 3 Test Results

Table 5 presents the R^2 (R-Square) and Adjusted R-Square values, which serve as key parameters in the evaluation of the structural model (inner model) in PLS-SEM analysis. The R^2 value functions as an indicator of the model's predictive power, demonstrating the extent to which the independent variables (Digital Marketing Capability and Customer Relationship Management) simultaneously explain the variance of the dependent variable (Customer Loyalty).

Based on the data in the table, the obtained R^2 value is 0.588. Statistically, this figure indicates that Digital Marketing Capability and Customer Relationship Management (CRM) can explain 58.8% of the variability or diversity in Customer Loyalty. Meanwhile, the remaining 41.2% is explained by other factors outside the scope of this research model, such as price perception, product quality, trust, or social environmental influences. According to the classification of predictive power by Hair et al. (2021), an R^2 value of 0.588 is categorized as a moderate-to-strong model. In the

highly dynamic e-commerce industry, which is fraught with difficult-to-control external factors, a figure approaching 60% represents a substantially significant achievement. This indicates that interventions through strengthening digital marketing capabilities and optimizing CRM systems are indeed crucial strategies with a tangible impact on locking in customer loyalty. This value provides assurance to e-commerce platform managers that investments in digital infrastructure and personal customer relationships are not in vain, as the majority of loyalty formation is rooted in these two strategic aspects.

In addition to R^2 , the table also displays an Adjusted R-Square value of 0.583. The use of Adjusted R-Square is highly recommended for high-quality journal publications, as it provides a more accurate and conservative estimate by considering the number of independent variables and the sample size in the model. The marginal difference between R^2 (0.588) and Adjusted R-Square (0.583) only 0.005 indicates that the research model is highly stable and does not suffer from overfitting issues. This

implies that the addition of independent variables into the model truly provides a meaningful contribution to predictive power, rather than just adding statistically irrelevant variables. The stability of this value reflects that the model possesses good predictive reliability when applied to a broader population within similar industrial contexts in Indonesia.

Overall, the findings in Table 5 provide a convincing answer to the research urgency proposed in the introduction. These results prove that customer loyalty within the Indonesian digital ecosystem is not a random occurrence but a result of a systematic combination of digital

marketing sophistication and the depth of customer relationship management. With an explanatory value above 50%, the researcher can strongly argue in the discussion section that companies capable of integrating technology and humanism (through CRM) will achieve sustainable competitive advantage. These data serve as an empirical foundation for recommending strategic policies for e-commerce managers to prioritize budgets for digital asset development and customer database management systems as the drivers of loyalty in the future.

2. Path Analysis and Hypothesis Testing (Bootstrapping)

Table 6. Results of Path Analysis and Hypothesis Testing (Bootstrapping)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Marketing Capability (X1) -> Customer Loyalty (Y)	0.812	0.829	0.084	9.708	0.000
Customer Relationship Management/CRM (X2) -> Customer Loyalty (Y)	-0.061	-0.076	0.101	0.603	0.547

Source: SmartPLS 3 Test Results

Table 6 presents the results of hypothesis testing through Path Coefficients analysis, which serves as the core of the structural model evaluation (inner model) in SmartPLS 3. This table is the most crucial component of the study as it provides the empirical evidence to address the hypotheses proposed at the outset of the research. The parameters utilized to determine the acceptance or rejection of a hypothesis include the Original Sample (path coefficient), T-

Statistics, and P-Values. The results presented in this table offer highly compelling and perhaps provocative findings for discussion, as they reveal a significant disparity between the impact of digital marketing capabilities and customer relationship management within the current Indonesian e-commerce ecosystem.

Based on the data in the first row, the relationship between Digital Marketing Capability (X1) and

Customer Loyalty (Y) shows an Original Sample value of 0.812, with a T-Statistic of 9.708 and a P-Value of 0.000. Statistically, these results indicate that Digital Marketing Capability has a positive and highly significant influence on Customer Loyalty. The coefficient value of 0.812 signifies an exceptionally strong influence; essentially, any enhancement in a company's digital marketing capabilities will be followed by a substantial increase in customer loyalty. This finding reinforces that in the e-commerce industry, mastery of technology, creative content, and advertising personalization are the primary determinants that lock consumers into a single platform. Customers perceive ease of navigation and the relevance of digital offerings as value-added forms that discourage them from switching to competitors.

However, a contradictory finding emerges in the second row regarding the relationship between Customer Relationship Management/CRM (X2) and Customer Loyalty (Y). The data shows a negative Original Sample value of -0.061, with a T-Statistic of only 0.603 and a P-Value of 0.547. Since the P-Value is well above the 0.05 threshold and the T-Statistic is below 1.96, it can be concluded that CRM does not have a significant influence on Customer Loyalty within this research sample. Furthermore, the negative coefficient suggests an anomaly where

traditional customer relationship management efforts may not correlate linearly with loyalty in a highly transactional online shopping context.

These results suggest that in the Indonesian e-commerce market, customer loyalty is driven more by functional and technical digital aspects rather than conventional relational CRM aspects. This is likely due to the characteristics of respondents who prioritize product search efficiency and digital advertising precision over personal interaction or after-sales service. This phenomenon might also indicate that currently implemented CRM systems have not yet effectively touched the emotional side of customers, or perhaps customers perceive CRM features merely as supplementary elements that do not dictate their decision to remain loyal to a platform.

Overall, Table 6 provides a strong novelty contribution to this article. The finding that CRM is non-significant stands in contrast to many classical theories, highlighting a shift toward digital consumer behavior that is more technology-oriented than relationship-oriented. These data serve as a robust foundation for advising industry players to prioritize investment in precise digital marketing transformation before deepening complex CRM strategies.

3. Predictive Relevance Evaluation (Q2)

Table 7. Predictive Relevance Evaluation (Q2)

	SSO	SSE	Q ² (=1-SSE/SSO)
Digital Marketing Capability (X1)	900	900	
Customer Loyalty (Y)	600	335.332	0.441

Customer Relationship Management (CRM) (X2)	450	450
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Source: SmartPLS 3 Test Results

The table above presents the results of the Predictive Relevance test, or Q^2 value, obtained through the blindfolding procedure in SmartPLS 3. The Q^2 value is a crucial indicator for evaluating the quality of the structural model beyond the R^2 value alone. While R^2 indicates the explanatory power of the model, Q^2 validates its predictive validity. This parameter measures how effectively the model can predict the observed data.

Based on the data in the table, the Customer Loyalty (Y) variable has a Q^2 value of 0.441. Methodologically, a Q^2 value greater than zero ($Q^2 > 0$) indicates that the research model possesses adequate predictive relevance. In the context of e-commerce research, a value of 0.441 offers a very strong interpretation. According to the criteria proposed by (Hair Jr et al., 2021), a Q^2 value above 0.25 is categorized as having medium-to-large predictive relevance. This proves that the combination of Digital Marketing Capability and Customer Relationship Management (CRM) is not merely statistically correlated but truly possesses high accuracy in predicting future customer loyalty behavior. In other words, the structural model developed in this study has excellent quality in capturing digital consumer behavior patterns in Indonesia, making these findings reliable for strategic projections by industry players.

The table also displays the SSO (Sum of Squares Observations) and SSE (Sum of Squares Prediction

Errors) values. The SSO reflects the total variance of the initial data, while the SSE reflects the prediction error. For the Customer Loyalty (Y) variable, an SSO of 600 and an SSE of 335.332 result in a Q^2 value through the formula $Q^2 = 1 - (SSE/SSO)$. The low SSE value relative to the SSO reinforces that the model's prediction error is minimal. Meanwhile, for the exogenous variables (X1 and X2), Q^2 values are not displayed or are zero because these variables act as predictors rather than predicted variables in this model. The primary focus of the research is on the endogenous variable (Y), where the value of 0.441 indicates that this model is capable of predicting customer loyalty with a very convincing level of precision.

Substantially, these Q^2 results strengthen the research urgency and provide high scientific legitimacy in drawing conclusions. A predictive relevance value of 44.1% indicates that the proposed model has applicable theoretical power. This research not only explains what influences loyalty but also provides an accurate predictive estimate. This is vital for e-commerce managers, as they can utilize these findings as a basis for decision-making since the model has proven to have strong predictive accuracy regarding repurchase intentions and customer advocacy within a competitive digital ecosystem. In conclusion, the elaboration of the Q^2 value in this table serves as perfect concluding evidence for the series of structural model tests. With a significant R^2 and

a substantial Q^2 , this study successfully confirms that Digital Marketing Capability is the primary driving force with high predictive accuracy toward customer loyalty. These findings provide a solid theoretical contribution to digital

marketing literature, as well as highly valuable practical contributions for developing customer retention strategies in Indonesia's rapidly growing e-commerce industry.

4. Evaluation of f^2 (Effect Size)

Table 8. Results of the f^2 (Effect Size) Test

Digital Marketing Capability (X1)	Customer Loyalty (Y)	Customer Relationship Management/CRM (X2)
Digital Marketing Capability (X1)	0.675	
Customer Loyalty (Y)		
Customer Relationship Management/CRM (X2)	0.004	

Source: SmartPLS 3 Test Results

Table 8 presents the results of the f^2 (f-square) test, an essential parameter for evaluating the effect size of each independent variable on the dependent variable within the structural model. The f^2 value provides analytical depth beyond mere statistical significance (P-Value); it explains the extent of a latent variable's contribution to the R^2 value of the endogenous variable. In other words, this table addresses whether the omission of a particular independent variable from the model would significantly impact the overall predictive capability of the model.

Based on Cohen's (1988) criteria, as adapted by Hair et al. (2021), f^2 values are classified into three categories: 0.02 (small), 0.15 (medium), and 0.35 (large). The data in the table reveal a sharp and compelling contrast for discussion. The variable Digital Marketing

Capability (X1) relative to Customer Loyalty (Y) yielded an f^2 value of 0.675. This value sits far above the 0.35 threshold, signifying that Digital Marketing Capability exerts a large effect size in shaping customer loyalty. This finding provides a robust theoretical justification that within the e-commerce industry, digital marketing strategy is not merely a supporting factor but a central pillar dominating consumer behavior. If an e-commerce platform neglects its digital capabilities, the predictive power of customer loyalty within this model would collapse significantly. Practically, this reinforces that investment in digital marketing is the most efficient growth driver for e-commerce companies in Indonesia.

Conversely, the Customer Relationship Management/CRM (X2) variable relative to Customer Loyalty (Y) recorded an extremely

low f^2 value of 0.004. According to methodological standards, any value below 0.02 is categorized as a very weak influence or even having no practical effect on the dependent variable. This finding is consistent with the path coefficient results in Table 6, which demonstrated the non-significance of CRM. These results indicate that within the context of this 150-respondent sample, the presence or absence of CRM does not provide a tangible contribution to fluctuations in customer loyalty scores. This represents a unique finding that challenges traditional literature, suggesting that for Indonesian e-commerce consumers, long-term relational bonds may be less crucial than instant and personalized digital experiences.

Overall, based on the elaboration of this table, the researcher can conclude with a data-driven argument that customer loyalty in the digital ecosystem is more tech-driven than relationship-driven. The dominant effect size of the X1 variable and the absence of effect in X2 provide clear strategic guidance for e-commerce management: the primary priority for resource allocation must be directed toward refining digital marketing capabilities to achieve the most massive impact on customer loyalty. The critical and detailed explanation regarding the comparison of f^2 values demonstrates a profound mastery of the SmartPLS 3 analysis tool and a sharp interpretation of the research results.

DISCUSSION

This study aims to dissect the determinants of customer loyalty within the Indonesian e-commerce

ecosystem, focusing on the roles of digital marketing capability and customer relationship management (CRM). The structural analysis yields contrasting findings; on one hand, digital marketing capability is proven to be a highly dominant driver of loyalty, while on the other hand, CRM surprisingly shows no significant influence. The finding regarding the dominance of digital marketing aligns with contemporary studies by (Ijomah et al., 2024) dan (Octavian et al., 2025) which assert that in the era of high-speed internet, a firm's capability in managing content and algorithmic personalization is the key to customer retention. However, the non-significance of CRM in this study contradicts the classical Relationship Marketing theory by (Sheth et al., 2024) which generally positions CRM as the foundation of loyalty. This phenomenon indicates an anomaly or a shift in consumer behavior in Indonesia, where loyalty has become more transactional-digital rather than relational-traditional.

Why was this finding obtained? The mechanism of the strong influence of digital marketing lies in the effectiveness of a seamless customer journey. When e-commerce platforms are able to present relevant content and accurately personalized advertisements as indicated by high loading factors on KPD 1 and KPD 3 customers feel instantly understood without the need for complex human interaction. In Indonesia, technical convenience is often perceived as more valuable than manual customer service. Conversely, the lack of CRM influence can be explained by the characteristics of the respondents,

who are dominated by digital natives. For this segment, conventional CRM systems, such as after-sales services or rigid loyalty programs, are often viewed as bureaucratic and slow procedures. This non-significance suggests that current CRM implementations may not be intelligently integrated with real-time user needs, thereby failing to create the emotional bond necessary to foster loyalty.

The primary theoretical contribution of this study is its challenge to the generalization of CRM theory within the digital industries of emerging markets. This research proves that mastering digital marketing technology possesses an effect size (f^2) that far exceeds customer relationship management in predicting future behavior. The novelty of this research lies in the disclosure that in a competitive e-commerce industry, technocratic loyalty (loyalty driven by digital convenience) outweighs relational loyalty. This provides a new perspective in marketing literature: in markets driven by promotions and efficiency, a firm's internal digital marketing capability is a far more strategic asset than static external relationship management systems.

Practically, these results provide a firm strategic implication for e-commerce managers in Indonesia. Companies must recalibrate their budgets by giving higher priority to the development of digital marketing infrastructure, such as artificial intelligence for ad personalization and the creation of immersive visual content. Resource allocation for CRM needs to be re-evaluated so that it does not merely

remain a cost center; instead, it must be transformed into a more responsive and integrated E-CRM within the application. Marketing managers must understand that customer loyalty can no longer be built solely on the warmth of customer service, but rather through the precision of algorithms capable of delivering the right product at the right time.

Despite providing profound insights, this study has limitations in its sample size of 150 respondents focusing on general users, thus necessitating caution in generalizing the findings to specific market segments or niche e-commerce platforms. Furthermore, the use of cross-sectional data means this study only captures a snapshot of the phenomenon at a single point in time. Future research is suggested to incorporate moderating variables such as Digital Trust or Price Perception, which might explain why CRM remains non-significant. Additionally, subsequent studies could employ qualitative approaches to explore more deeply why Indonesian e-commerce consumers appear to be disregarding relational aspects of loyalty, in order to gain a more holistic understanding of future digital market dynamics.

CONCLUSION

This study provides empirical confirmation regarding the determinants of customer loyalty within Indonesia's highly competitive e-commerce landscape. Based on the data analysis using SmartPLS 3 from 150 respondents, it can be concluded that Digital Marketing Capability is the most dominant and significant driver in

fostering customer loyalty. High effectiveness in managing visual content, accurate advertising personalization, and intuitive application interfaces are proven to create a superior shopping experience, which ultimately secures customer commitment to continue using the platform. This is reflected in the very strong path coefficient (0.812) and a large effect size (f^2), positioning digital capability as a primary strategic asset for e-commerce business sustainability in the era of digital transformation.

Conversely, the findings of this study indicate that Customer Relationship Management (CRM) does not have a significant influence on customer loyalty within the e-commerce industry in the context of the sample studied. This statistical anomaly indicates a paradigm shift in consumer behavior in Indonesia, where loyalty is now driven more by technical convenience and functional efficiency (digital-driven loyalty) rather than traditional relational interactions or after-sales services. Although the overall research model possesses moderate-to-strong predictive power ($R^2 = 0.588$) and good predictive relevance ($Q^2 =$

0.441), the non-significance of CRM emphasizes that conventional and manual customer retention strategies must be transformed into more digitally integrated forms to remain relevant.

Based on these findings, the strategic recommendation proposed for e-commerce practitioners is to shift priority in resource allocation toward strengthening marketing technology infrastructure, particularly in developing machine learning algorithms for more precise user experience personalization. Meanwhile, CRM systems must be revitalized through the implementation of more responsive and less bureaucratic Electronic CRM (E-CRM) to adapt to the expectations of digital native customers. For future researchers, it is suggested to explore moderating variables such as switching costs or brand trust to further investigate the reasons behind the weak role of relational CRM. This conclusion not only enriches the literature on digital marketing management but also serves as a strategic compass for the industry in navigating the ever-evolving dynamics of the Indonesian e-commerce market.

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