AI Marketing Management and Data Privacy Compliance: Effects on Consumer Behavior and Loyalty

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Abstract— **Artificial Intelligence (AI) has significantly transformed digital marketing within e-commerce. However, the effects of AI on customer loyalty, data ethics, and legal compliance are frequently examined in isolation, resulting in limited understanding of their combined influence in developing markets. This study investigates how AI-based marketing, ethical considerations, and legal regulations affect the loyalty of Shopee users in West Java, with a focus on Generation Z and Millennials. A survey of 120 individuals from the academic community in West Java was conducted, and multiple linear regression was employed to ensure analytical accuracy and reliability. The results indicate that AI-driven marketing, responsible data management, and adherence to legal regulations collectively enhance online customer loyalty. Notably, compliance with personal data protection laws emerged as the most influential factor in fostering loyalty. Although AI facilitates personalized marketing, regulatory clarity and transparency are the primary drivers of sustained user trust. The findings suggest that contemporary customer loyalty depends not only on technological innovation but also on transparent data practices and robust legal compliance. This research provides online businesses with foundational guidance for maintaining success through responsible conduct and the protection of user data.**

Keywords*:* **Artificial Intelligence, Customer Loyalty, Data Ethics, E-commerce, Legal Compliance**

1. INTRODUCTION

Artificial Intelligence (AI) has changed e-commerce in many ways. Businesses now depend on digital transformation to keep up. One common use of AI is content personalization [1]. E-commerce companies also face higher customer expectations for fast, secure, and personalized shopping. Today's customers expect high service quality, especially quick delivery and good after-sales support [2]. According to Kantar's research, 54% of Indonesian online shoppers use AI tools to get shopping suggestions tailored to their needs [3]

Online marketplaces such as Shopee serve as transaction platforms. They also act as data controllers, managing the privacy of millions of users. Failure to protect personal data or meet legal requirements exposes companies to lawsuits. It also causes reputational

harm and reduces customer trust. From 2020 to 2023, Indonesia faced major data breaches. About 91 million user accounts were compromised. Personal details like names, phone numbers, and email addresses were accessed and sold on the dark web. Financial data remained encrypted. These events highlight the dangers of poor data management in large online marketplaces. In South Korea, a breach exposed 33 million customer records [4]. This led to legal investigations. As a result, following personal data protection regulations is now essential for digital businesses.[5]

Indonesia's Law No. 27 of 2022 on Personal Data Protection shows that the government sees the urgent need to protect data as digital threats grow. This law is an important move toward a stronger legal framework. Still, putting the law into practice and making sure it is followed remains difficult, especially because of limited resources and the fast pace of technology. [6]

AI development brings challenges such as algorithmic bias, regulatory gaps, data privacy risks, and labor-market impacts from slow technology adoption. This study examines how AI affects marketing and how customers view data security, which can influence their loyalty to platforms. While many studies have explored AI in digital marketing [7], there is still little systematic research on its effectiveness, especially in Indonesian e-commerce. Also, [8] points out that users often hesitate to use these systems because they worry about data breaches or misuse of information. [9]

This study examines how AI-driven marketing, data ethics, and legal compliance with consumer protection laws affect consumer loyalty among Shopee e-commerce users, both separately and together. It also looks at how technology-based marketing interacts with ethical standards and regulations to shape consumer relationships. The results aim to help marketing managers see that using AI effectively requires investing in data security, ethical data management, and transparency. From a regulatory perspective, the study provides evidence that laws like the personal data protection law (PDP Law) function not only as rules to follow but also as signals that shape the digital business environment and build public trust in e-commerce platforms.

2. THEORITICAL REVIEW

E-business marks a major shift, making technology a key part of business strategy instead of just a support tool. This change allows for more interactive online shopping, but it also requires careful management of both innovation and data security. Using advanced analytics, companies can turn customer data into useful insights, helping them manage their operations with greater accuracy [10] [11].

2.1 AI-Driven Marketing

AI-Driven Marketing uses Artificial Intelligence (AI) to collect and analyze large consumer datasets, predict buying behavior, and automate marketing decisions and actions [12]. Today, digital marketing success is less about quick financial gains and more about aligning company goals with the personal needs of consumers. Although AI and automation help marketers personalize their approach, these systems are becoming more complex in a crowded market, which can make them less transparent and reduce consumer trust. Building lasting loyalty now relies not just on precise algorithms, but also on keeping technology transparent and focused on long-term relationships [13].

2.2 Data Ethics

Data ethics looks at moral questions that come up during every stage of working with data, such as collecting, storing, analyzing, using, and sharing it. It asks which data practices are acceptable and how they affect people and society. [14] As technology grows, data ethics matters more for making sure human values are respected by handling data openly. When digital platforms use clear ethical rules, they can make automated systems more transparent and improve user security. These responsible practices help earn consumer trust, which is important for turning digital interactions into long-term loyalty in a busy market [15].

2.3 Legal Compliance

Legal compliance means that businesses follow all relevant laws and regulations. [16] In the Governance, Risk, and Compliance (GRC) framework, legal compliance is a key part of good governance. This research focuses on how consumers view legal compliance specifically, how users decide if an e-commerce platform meets its legal duties. Instead of using formal audits or document reviews, the study looks at whether consumers think Shopee follows rules like the Indonesian PDP Law (Law No. 27 of 2022) and its own ethical standards [17].

2.4 Loyalty

Legal compliance is when businesses follow all relevant laws and regulations. Consumer loyalty is important in marketing and consumer behavior. According to Oliver (1999), loyalty is a strong commitment to keep buying or using a preferred product or service, even when other options or marketing efforts try to change that choice. In the digital economy, loyalty has moved from physical brands to platforms. Platform loyalty combines a psychological commitment to the ecosystem and regular use of the app for different needs. It is more complex than traditional loyalty because it involves long-term use and active support. Users show this loyalty when they make the platform their main way to access the digital marketplace, valuing the platform's ecosystem more than individual product brands within it [18].

Table 1. Previous studies

No	Research Title	Research Findings	Limitations / Research Gaps
1	The Role of Artificial Intelligence in Fostering Business Sustainability and Enhancing Consumer Loyalty within the Global Competitive Landscape. [19]	Consumer loyalty has a positive but non-significant effect on artificial intelligence (AI).	The study does not examine the influence of Data Ethics and Legal Compliance on Consumer Protection.
2	Legal Perspectives on Personal Data Protection in the Digital Age: Examining Data Breach Incidents Among E-commerce Service Users. [6]	Although the PDP Law provides a stronger legal framework, its implementation still faces significant obstacles.	This study does not examine data ethics and the use of artificial intelligence (AI) in marketing.
3	Consumer Acceptance of Shopee Chatbot Technology: A Case Study of E-Commerce Platforms in Indonesia. [20]	Perceived Usefulness, Perceived Ease of Use, and Privacy Risk play a pivotal role in shaping user Trust and Attitude.	This study does not examine AI-driven marketing, data ethics, and consumer protection compliance.
4	The Effectiveness of Artificial Intelligence in Developing Digital Marketing Strategies. [8]	Shopee's effectiveness in digital marketing strategies is significantly influenced by its adaptability to Artificial Intelligence technology (AI).	This research does not examine data ethics and consumer protection compliance.
5	The Influence of Chatbot Recommendation Accuracy and Trust in AI Technology on Purchase Intention for Shopee Products Among Users in Kendari City. [1]	Chatbot recommendations and trust in AI technology significantly influence user purchase intention on e-commerce platforms, particularly Shopee.	This study does not examine AI-driven marketing, data ethics, and consumer protection compliance.

Most existing research is quite broad and does not clearly connect AI-driven marketing, data ethics, and consumer protection law compliance. This study aims to fill that gap by bringing these three areas together, focusing on Indonesia. The following section lists the indicators for AI-based marketing, data ethics, legal compliance, and loyalty, as drawn from recent management literature.
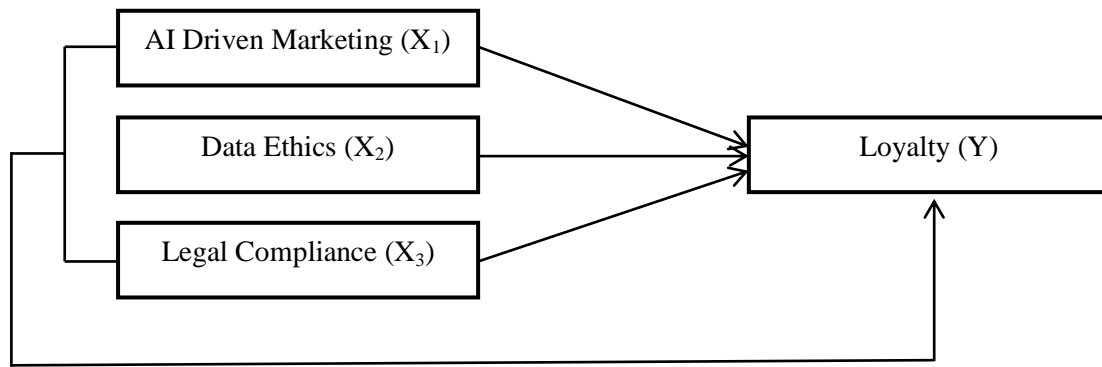
Figure 1. Conceptual Framework

Research Hypotheses :

H1 : AI-driven marketing management implementation significantly affects the customer loyalty of Shopee e-commerce platform users.

AI-driven personalization has become a key factor in building consumer loyalty, helping to increase both engagement and satisfaction. Instead of just making purchases easier, personalized algorithms change how consumers relate to brands by meeting both practical needs and emotional connections. Recent studies show that when marketing is tailored to each person, it not only encourages repeat business but also creates a stronger psychological bond with the brand. Still, this approach works best when companies balance highly relevant offers with maintaining consumer trust, which is essential for long-term satisfaction [21].

H2 : Data ethics compliance serves as a critical determinant of consumer loyalty for users of the Shopee e-commerce platform.

Ethics in digital marketing, such as fairness, transparency, and careful data use, are important for building consumer trust. Research shows that privacy concerns and ethical data practices have a direct impact on trust, which in turn affects customer loyalty [22].

H3 : Legal compliance in consumer protection serves as a critical driver of consumer loyalty within the Shopee e-commerce ecosystem.

In the fast-changing world of e-commerce, complying with data and consumer protection laws is more than just meeting requirements. It is a key part of building trust and a sense of security. Meeting strict standards, like those for personal data protection, is not only about avoiding legal trouble. It also shows customers that the platform is trustworthy. Studies in different digital markets show that following these rules is closely tied to higher consumer confidence. When platforms are open about their commitment to legal protections, they reduce risk and create an environment where users feel comfortable staying loyal over time [23].

H4 : AI-driven marketing management implementation, data ethics compliance, and legal compliance with consumer protection collectively serve as significant determinants of consumer loyalty for Shopee e-commerce users.

AI personalization, ethical data use, and legal compliance work together to improve technical results and build the trust needed for customer loyalty. Research shows that digital platforms combining advanced marketing with ethical and legal standards are more likely to earn lasting, trust-based loyalty [21].

3. METHOD

This study uses a quantitative, explanatory research design. It examines the causal relationships and tests hypotheses between the independent variables, AI-Driven

Marketing (X1), Data Ethics (X2), and Consumer Protection Law Compliance (X3), and the dependent variable, Consumer Loyalty on the Shopee platform (Y). This study focuses on active Shopee users in Indonesia who are Gen Z and Millennials of working age. Because the population is very large, we used purposive sampling, a non-probability method. To make sure participants had enough experience with AI features and data protection, only those with at least two transactions in the past six months were included. Based on the sample size method from [24], which suggests a 5:1 ratio of indicators to samples, we needed 120 respondents for the 24 questionnaire indicators. All participant data were collected voluntarily and anonymously after informed consent. Since we used convenience sampling, most respondents are final-year students in technology and management. This limits how much the findings can be applied to other groups, so the results should be viewed in light of this specific demographic [25].

Table.2 Operational Variabel

No	Variable	Dimension
1	AI-Driven Marketing (X1)	Automated Personalization, Algorithmic Targeting and Segmentation, Marketing Automation, Chatbot-Based Interaction, Predictive Analytics, Marketing Effectiveness, and Technological Reliability and Performance.[26]
2	Data Ethics (X2)	Measured Through Transparency, Responsible Data Usage, Fairness and Bias Mitigation, Consumer Consent and Control, Data Security, And Accountability and Governance. [27]
3	Legal Compliance (X3)	Measured Through Information and Service Transparency, Quality and Reliability, Consumer Safety, Complaints and Dispute Resolution, Liability For Losses, Data Privacy and Security, And Equal Access.[28]
4	Consumer Loyalty (Y)	Measured Through Repurchase Intention, Willingness To Recommend The Platform (Word-Of-Mouth), Long-Term Commitment, and Trust-Based Loyalty.[29]

Primary data were collected by distributing an online questionnaire. The questionnaire used a 5-point Likert scale, with options from 'Strongly Disagree' to 'Strongly Agree'. Before sharing it widely, the questionnaire was tested for validity using the Pearson Product Moment and for reliability using Cronbach's Alpha to make sure the items were accurate and consistent. We used IBM SPSS Statistics software to analyze the data. First, we checked whether our tools measured what we intended and whether they were reliable. We compared each item to the overall set to see if the numbers matched; items with higher scores were considered valid. We assessed reliability using Cronbach's Alpha, and scores above 0.70 indicated consistent results.

Before running the multiple linear regression analysis, we tested the classical assumptions to make sure the model met the Best Linear Unbiased Estimator (BLUE) criteria. We checked normality with the Kolmogorov-Smirnov test and Normal P–P Plot. To assess multicollinearity, we looked for Tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10, which showed there were no strong correlations among the independent variables. We used the Glejser test and scatterplots to check for heteroscedasticity and confirm that the residuals were evenly spread. Multiple linear regression analysis was employed to examine the simultaneous effects of AI-driven marketing, data ethics, and legal compliance on consumer loyalty, as well as to quantify the direction and magnitude of these relationships. This method was selected in accordance with the research objectives, and the regression model is expressed as:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + e$$

where consumer loyalty is the dependent variable, a represents the constant, b denotes the regression coefficients, and the independent variables include AI-driven marketing, data ethics, and legal compliance. Hypothesis testing was conducted using the t-test to examine the partial effects of each independent variable on consumer loyalty and the F-test to assess their simultaneous influence, both evaluated at a significance level of p <

0.05. The coefficient of determination (R²) was used to measure the explanatory power of the model in accounting for variations in consumer loyalty.

4. RESULTS AND DISCUSSION
4.1 Result
4.1.1 Respondent Profile

This study gathered data from 120 respondents. Most participants are Gen Z or Millennials (aged 18 to 35) and are active Shopee users. Many respondents (85.8%) make 3 to 5 transactions each month, which shows a strong reliance on the digital ecosystem. The sample was chosen using purposive sampling, focusing on people with academic backgrounds in Information Technology and Economics. This approach ensures that participants have the knowledge needed to assess topics like AI-driven marketing and data privacy ethics.

4.1.2 Results of Instrument and Classical Assumption Testing

The SPSS analysis showed that all questionnaire items were valid because their calculated r-values were higher than the critical r-table values. The instruments were also highly reliable, with Cronbach's Alpha coefficients above 0.70 for all variables. The classical assumption diagnostics yielded the following results:

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test		Unstandardized Residual
N		120
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	16.09777875
Most Extreme Differences	Absolute	.146
	Positive	.146
	Negative	-.082
Kolmogorov-Smirnov Z		1.599
Asymp. Sig. (2-tailed)		.012
a. Test distribution is Normal.		
b. Calculated from data.		

Source: Processed Data, 2025

Based on Table 3, the results of the One-Sample Kolmogorov–Smirnov Test on unstandardized residuals, an Asymp. Sig. (2-tailed) value of 0.012 was obtained, which is smaller than the significance level of 0.05. This indicates that the residuals are not normally distributed, so the assumption of normality is not met. With a sample size of 120, the Kolmogorov–Smirnov Z value of 1.599 reinforces the deviation of the residual distribution from the normal distribution. Therefore, researchers need to consider data transformation, the use of alternative estimation methods, or nonparametric statistical tests in further analysis.

Table. 4 Multicolinierity Test

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.135	2.288		.933	.353		

Aiforecommerce	.180	.094	.191	1.912	.058	.195	5.139
Data Ethics	.178	.092	.212	1.944	.054	.163	6.137
Legal Complience	.470	.081	.517	5.768	.000	.242	4.132
a. Dependent Variable: LOYALTY							

Source: Processed Data, 2025

Based on Table 4, the Coefficients table, it can be concluded that of the three independent variables tested against LOYALTY, only Legal Compliance has a positive and significant effect (B = 0.470; Sig. = 0.000 < 0.05). Meanwhile, AI for e-commerce (Sig. = 0.058) and Data Ethics (Sig. = 0.054) show a positive but not yet statistically significant effect at the 5% level. The largest Standardized Beta value was found in Legal Compliance ($\beta = 0.517$), indicating that this variable is the most dominant factor in influencing loyalty. In terms of multicollinearity, Tolerance values < 0.20 and VIF > 5 in several variables indicate the potential for multicollinearity, so caution is needed in interpreting the regression results.

4.1.3 Multiple Linear Regression Analysis
Table 5. Simultaneous F-Test

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	9851.173	3	3283.724	132.568	.000[b]
Residual	2873.327	116	24.770		
Total	12724.500	119			

Source: Processed Data, 2025

Based on the ANOVA table, the F value of 132.568 with a significance of 0.000 (< 0.05) indicates that the regression model is simultaneously significant. This means that all independent variables in the model collectively influence the dependent variable. The comparison of the regression Sum of Squares value (9,851.173), which is much greater than the residual (2,873.327), indicates that the model is able to explain a large proportion of the variation in the dependent variable, so that the regression model can be considered statistically valid and robust.

Table. 6 Coefficient Determination Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880[a]	.774	.768	4.977

Source: Processed Data, 2025

Coefficient of Determination (R^2): The R-Square value of 0.774 implies that 77.4% of the variance in Consumer Loyalty is explained by the three independent variables, while the remaining 22.6% is attributed to other factors outside this model.

4.2 Discussion
4.2.1 The Impact of AI-Driven Marketing on Consumer Loyalty
The research shows that AI-driven marketing strongly affects Shopee users' loyalty. This supports the findings of [1], which state that content personalization and effective chatbots create a more relevant shopping experience. Also, AI's quick response to after-sales complaints helps consumers feel valued.

4.2.2 The Impact of Data Ethics on Consumer Loyalty
Data ethics plays a key role in building long-term trust. By 2025, consumers are more careful about how their personal information is used. When Shopee is open about how its

algorithms work and makes sure they are fair, and when it asks clearly for data consent, it helps ease worries about misuse. As [9] notes, feeling secure about data integrity is the main reason for loyalty in the digital age.

4.2.3   The Impact of Legal Compliance on Consumer Loyalty

This variable has the highest regression coefficient (beta = 0.858), showing that following Law No. 27 of 2022 on Personal Data Protection (PDP Law) is the main factor driving consumer loyalty today. When legal requirements like certified data security are put into practice, consumers feel more certain and secure. These results support the view of [5] who argue that data protection tools should be seen not just as a regulatory burden, but as a strategic asset for business sustainability.

4.2.4   Synthesis and Research Gap

AI offers many conveniences, but its effectiveness relies on strong regulation and ethical standards. These findings help fill the research gap noted by [8] about the need to better understand how well AI works. Shopee's long-term success as a top marketplace depends on balancing advanced technology with strict legal protections. [30] Recent studies show that when people know marketing content is created by AI, they may feel doubtful or skeptical. If consumers realize ads are made by AI, they often see them as less genuine, which can lower loyalty and reduce their intention to buy. This effect is even stronger for high-risk products or services, where emotional trust is especially important in making purchase decisions.

AI in marketing depends on having enough training data. If this data has historical biases or does not represent everyone, AI models can continue or even worsen discrimination against some groups. For instance, advertising algorithms might regularly leave out certain groups or give unfair preference to others. This goes against ethical standards, can harm a brand's reputation, and may increase social inequalities, especially when it comes to access to promotions or services.[30]

A key challenge of using AI in marketing is that it often involves collecting and processing large amounts of consumer data. AI tools look at how people behave, what they like, and how they interact to make marketing more personal. However, if there are no clear rules to protect this data, privacy issues can arise. Research shows that AI-based data collection can lead to a surveillance economy, where people are watched without fully understanding how their information is used. This can make consumers trust brands and digital platforms less [31].

5.   CONCLUSION

AI-driven marketing, data ethics, and legal compliance all affect how loyal consumers are to Shopee. This study is limited because it looks at just one e-commerce platform, so the findings might not apply everywhere. Future research should compare several platforms to see if consumer reactions to privacy policies and AI marketing are different. It would also help to consider digital literacy, since people in Indonesia have varying levels of legal awareness and tech skills. Qualitative methods, such as in-depth interviews, could provide a better understanding of consumer worries and anxiety about bias in AI marketing systems. This study adds to marketing research by showing that consumer loyalty depends more on data ethics and legal certainty, such as following the Personal Data Protection Law (Law No. 27 of 2022), than just on advanced AI. For managers, this suggests that e-commerce platforms should focus on making personalization more transparent and secure, rather than only improving algorithms, to address concerns about bias. For policymakers, the findings highlight the need to improve oversight of AI ethics and expand digital literacy programs, since legal compliance helps build public trust in Indonesia's digital economy.

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