

The influence of e-CRM, e-WOM, and e-service quality on the e-loyalty of online consumers**Bakhtiar Tijjang^{a*}, Tjahjanto^b, Widya Cholil^c, Neneng Nurbaeti Amien^d, Antok Supriyanto^e, Adi Waskito^f, Istiana Hermawati^g and M. Hamdan Basyar^h**^a*Institut Ilmu Sosial dan Bisnis Andi Sapada, Parepare, Indonesia*^b*Faculty of Computer Science, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia*^c*Informatics Departement, Universitas Pembangunan Nasional Veteran Jakarta., Indonesia*^d*Universitas Muhammadiyah Bandung, Indonesia*^e*Universitas Dinamika, Indonesia*^f*Faculty of Economics and Business, Universitas Indonesia, Indonesia*^g*Badan Riset dan Inovasi Nasional, Indonesia*^h*Research Center for Politics, National Research and Innovation Agency (BRIN), Indonesia***CHRONICLE**

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ABSTRACT

The purpose of this study is to analyze the relationship between e-CRM (Electronic Customer Relationship Management) variables on e-Loyalty of online shop customers, e-WOM (electronic word-of-mouth) on e-Loyalty of online shop customers, and e-service quality on e-Loyalty of online shop customers. This study uses a quantitative approach. The population consists of all online shop consumers, and the sample of this study is 765 online shop consumers. The sampling technique used is simple random sampling. The research instrument is a questionnaire with a 7-point Likert scale. The research variables include e-CRM (Electronic Customer Relationship Management), e-WOM (electronic word-of-mouth), e-service quality, and e-Loyalty. Data were analyzed using Partial Least Square – Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The analysis consists of two stages: Outer Model (Measurement Model): Testing convergent validity, discriminant validity, and reliability. Inner Model (Structural Model): Testing path coefficients, R² values, and direct effects or hypothesis testing. The results of this study are E-CRM (Electronic Customer Relationship Management) has a positive relationship on e-Loyalty of online shop Customers, e-WOM (electronic word-of-mouth) has a positive relationship on e-Loyalty of online shop Customers, E-service quality has a positive relationship on e-Loyalty of online shop Customers. Optimal implementation of E-CRM, e-WOM and E-service quality through applications or websites can improve the overall user experience, which will ultimately encourage e-loyalty.

1. Introduction

The e-CRM phenomenon in Indonesia is characterized by the increasing use of e-CRM systems by companies, particularly in the e-commerce and digital sectors, to improve customer experience and loyalty through personalization, data analysis, and service automation. Despite challenges such as data management and customer expectations, e-CRM is key to building strong customer relationships to achieve loyalty and business growth in Indonesia's digital age (Fatikah & Albanna, 2022). E-CRM helps companies personalize customer experiences, such as relevant product recommendations on e-commerce platforms, thereby increasing satisfaction and loyalty. E-CRM automates processes related to customer relationships, thereby shortening service times and increasing efficiency. By deeply understanding customer behavior and preferences, companies can offer better service, thus gaining a competitive edge in the market (Kurniawati et al., 2024). Using e-CRM to store customer activity history, such as travel history, can improve service delivery. Implementing e-CRM to personalize the shopping experience, including product recommendations, can build customer loyalty. Customers have high expectations for speed and accuracy in

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receiving solutions from companies. Difficulty in adapting e-CRM systems to the unique needs of each company is a common obstacle. Customer data management must be handled carefully, especially with regulations such as the Data Protection Act. There is a trend where some companies may return to a more offline business model after the pandemic, which will impact E-CRM strategies. The E-CRM phenomenon in Indonesia is a significant trend in the digital transformation of businesses, where companies are adopting this system to manage and improve customer relationships online. Despite the challenges, the benefits of E-CRM in building customer loyalty and driving business growth are significant, making it a crucial component for companies in Indonesia today (Anser et al., 2023).

The phenomenon of E-CRM in companies is the use of information technology systems to manage customer relationships electronically, with the aim of increasing customer loyalty and business efficiency through process automation, communication personalization, and customer data analysis (Rahadjeng et al., 2022). Companies utilize E-CRM to track customer interactions, provide personalized services, and collect data to improve the quality of products and services. E-CRM allows companies to build and manage relationships with customers through digital platforms such as websites and applications, replacing traditional methods. E-CRM systems allow companies to collect and analyze customer behavior data, which is then used to provide relevant and personalized offers and communications, building long-term relationships. E-CRM automates various tasks, including lead management, sales monitoring, and customer service, thereby reducing manual workload and increasing operational efficiency. By better understanding customer needs through E-CRM, companies can provide a positive and consistent experience, which ultimately drives customer loyalty and prevents them from switching to competitors (Haudi et al., 2022). E-CRM brings together customer data from various channels such as email, social media, and chat applications in a single dashboard, providing a comprehensive view of each customer. The data collected by the E-CRM system helps companies in making strategic decisions regarding products, services and marketing campaigns.

The e-WOM (Electronic Word of Mouth) phenomenon in Indonesia is the sharing of positive or negative information and opinions about products or services through electronic media such as social media and other online platforms, which has occurred significantly along with the increase in internet and smartphone usage. This phenomenon has become an important marketing strategy for brands to increase brand awareness and influence consumer purchasing decisions because it is trusted by other consumers, and often takes advantage of virality and buzz on social media. Indonesians widely use social media such as Instagram, TikTok, and Twitter to share experiences, making them the main platform for e-WOM (Fuad & Abdullah, 2023). Consumers play an active role as "advertising media" by voluntarily sharing their comments, reviews, and experiences, which can influence other consumers. E-WOM is an evolution of traditional word-of-mouth (WOM), where communication occurs electronically and does not require physical meetings. Information from e-WOM greatly influences consumer purchasing decisions, such as tourists' decisions to visit a place or product purchasing decisions on e-commerce. Brands use e-WOM to build brand awareness and increase promotions (Harliyanto & Soediantono, 2022). Companies integrate e-WOM into their digital marketing strategies to effectively reach consumers through social media. E-WOM plays a role in shaping public opinion about a product or service, both positive and negative, which can impact a company's reputation. Consumers tend to trust reviews from other consumers more than traditional advertising, so positive e-WOM can increase trust and purchase intention. The phenomenon of e-WOM (electronic word-of-mouth) in companies is the dissemination of information, reviews, recommendations, or opinions (positive or negative) about a product or company through electronic media such as social media, forums, blogs, and review sites by consumers. This phenomenon is important for companies because e-WOM can influence consumer trust, purchase decisions, and help build brand image through interactive and ongoing communication between consumers online (Mohamed et al., 2022). Satisfied or dissatisfied consumers will share their experiences through digital platforms. This information is disseminated through various media, including text, images, and videos on social networking sites, blogs, and discussion forums (Rachmawati & Syafarudi, 2022). E-WOM can positively or negatively influence consumer purchasing decisions, building or damaging brand trust. E-WOM can be used as a modern way to build image and support for a brand or product. Information shared electronically has a significant influence on consumer purchasing decisions. E-WOM contributes to a company's marketing strategy by providing an electronic "word of mouth" effect. Companies can empower consumers to share honest and voluntary comments through certain incentives, thereby increasing their engagement (Elsje et al., 2023).

The E-Service Quality phenomenon in Indonesia is characterized by the high use of digital applications that encourage customer satisfaction through ease and efficiency of service. However, there are also challenges such as technical obstacles such as blank screens and weak servers, as well as price issues that are considered expensive by some users. Good e-service quality has a very positive influence on customer satisfaction and loyalty, becoming one of the key factors in the success of e-commerce services and other digital applications in Indonesia (Sulistio & Bastaman, 2023). Good e-service quality has been proven to significantly increase customer satisfaction, such as ease of electricity payments, token purchases, and complaints about disruptions through mobile applications. Digital services allow customers to conduct various transactions and obtain product information more quickly and easily, without having to come to the office. Good e-Service Quality can build customer loyalty to an application or platform, especially in the e-commerce industry such as Shopee. E-commerce opens up great opportunities for companies to increase sales, revenue, and market reach through easy and interactive online services. Some users in Indonesia experience technical problems such as blank screens, weak servers, and difficulty loading website pages, which reduce the overall quality of service. Some e-services in Indonesia are considered too expensive by the public, affecting user satisfaction and loyalty. Several studies have shown that indicators such as information or estimated waiting times in

applications need to be improved to maintain e-service quality (Suharsono, et al., 2021). The phenomenon of e-service quality in companies is the ability of digital platforms (websites, applications) to provide effective and efficient services to customers, which significantly affects customer satisfaction, increases customer loyalty, encourages word-of-mouth marketing, and is key to repeat sales and a broader customer base. This phenomenon also presents challenges for companies in terms of maintaining digital infrastructure and adapting to ever-evolving technologies.

The e-loyalty phenomenon in Indonesia is the increasing intention and behavior of customers to make repeat purchases and recommend an e-commerce platform or other digital services to others, driven by factors such as e-service quality, e-trust, and e-satisfaction. This phenomenon is important for online businesses in Indonesia because loyal customers are cheaper to retain and contribute to future profits and sales. E-loyalty is a consumer's attitude toward an online site, demonstrated by making repeat purchases in the future and recommending the company's products or services to others. The quality of service provided through electronic platforms significantly influences customer loyalty (Younis et al., 2024). The level of consumer trust in an e-commerce platform or digital service is also an important factor in building e-loyalty. Customer satisfaction gained from previous shopping experiences is key to encouraging repeat purchases and increasing loyalty. E-loyalty helps companies maintain their competitive advantage in an increasingly competitive market (Ahidin et al., 2021). Long-term customer relationships built through e-loyalty contribute to increased company profitability. Loyal consumers tend to recommend a company's products or services to others, which positively influences brand awareness. The e-loyalty phenomenon is clearly visible on various e-commerce platforms in Indonesia, such as Tokopedia and Shopee. These companies strive to improve e-service quality, build e-trust, and provide e-satisfaction so that customers are loyal and make repeat purchases, even willing to recommend the platform to their friends and family. The e-loyalty phenomenon (electronic loyalty) is a condition where customers demonstrate a positive attitude that results in repeat purchases and recommendations of a company's products or services through electronic channels. This loyalty is driven by good e-service quality (electronic service quality), e-trust (trust in the digital platform), and e-satisfaction (satisfaction with the online experience). E-commerce companies need to focus on these aspects to build a loyal customer base amidst fierce competition. Customers return to purchase products or use services from the same company consistently (Zhang et al., 2021). Loyal customers recommend a company's products or services to friends, family, or through other digital platforms. Loyal customers are less likely to seek information or solutions from competitors and want to continue their relationship with the company. Companies like Tokopedia demonstrate e-loyalty as part of their customer-centric approach, where excellent service encourages customers to stay on the platform. For e-commerce companies like Blibli.com, ensuring high-quality service is crucial to increasing customer satisfaction and trust, leading to loyal customers.

2. Literature Review

2.1 E-CRM (Electronic Customer Relationship Management)

E-CRM (Electronic Customer Relationship Management) is a strategy and system for managing customer relationships electronically using digital technologies such as the internet, email, social media, and messaging apps to improve online marketing, sales, and customer service (Mosa, 2022). The goal is to increase customer retention and satisfaction by leveraging data and interactions across various digital channels to build better relationships and achieve business goals. E-CRM, or Electronic Customer Relationship Management, is an electronic-based customer relationship management strategy and system that uses digital technologies such as websites, social media, and mobile apps to understand, serve, and retain customers. The goal is to increase customer satisfaction and loyalty by providing a more personalized and efficient experience through various digital communication channels (Madueke & Eyupoglu, 2024). E-CRM uses internet technologies, such as email, websites, messaging apps, and social media platforms. E-CRM collects and analyzes customer data from various digital sources to understand their preferences. By understanding customer data, companies can provide more personalized and relevant services. E-CRM combines various systems, such as sales, marketing, and service, into a single digital platform. The main goal of E-CRM is to provide a better experience through easier and more personalized interactions. Build strong relationships with customers through consistent and relevant services (Ali & Alfayez, 2024). Optimize sales, marketing, and customer service processes to be more efficient and integrated. By understanding customers in depth, companies can target appropriate offers and increase sales. E-CRM, or Electronic Customer Relationship Management, is a digital technology-based strategy and system that allows companies to manage interactions with customers electronically through various digital channels such as email, social media, and websites, with the aim of building, maintaining, and improving profitable customer relationships and customer satisfaction. E-CRM combines hardware, software, processes, and management commitment to support the overall CRM business strategy (Purnomowati et al., 2022). The main benefits of e-CRM are increased customer satisfaction and loyalty, increased operational efficiency through automation and centralized data management, increased revenue with more targeted marketing, and ease of access and personalization of services through digital platforms.

2.2 eWOM (Electronic Word of Mouth)

Electronic Word of Mouth (eWOM) is the dissemination of information (both positive and negative) about a product or company via the internet, by potential, current, or former consumers. Unlike traditional WOM, eWOM reaches a wider audience and can spread more quickly through digital platforms (Purnomowati et al., 2022). Electronic Word of Mouth (e-

WOM) is the dissemination of information, both positive and negative, about a product, service, or company by consumers, potential, or former customers via the internet and other digital tools. It is a modern form of word-of-mouth marketing communication that utilizes digital platforms such as social media and websites to reach a wider audience and influence consumer purchasing decisions (Sun et al., 2024). Electronic Word of Mouth (eWOM) is informal communication via the internet about a product or service, delivered by potential, current, or former consumers, whether positive or negative. Unlike traditional face-to-face word of mouth communication, eWOM utilizes digital platforms such as social media to disseminate information and opinions, which can have a significant impact on a company's reputation and consumer purchasing decisions. The main benefits of e-WOM (Electronic Word of Mouth) are increasing consumer trust, building brand awareness and loyalty, and improving purchasing decisions because reviews from other users are considered more honest and have a wider reach (Roslina & Mahrinasari, 2023). In addition, e-WOM can be more cost-effective for marketing and provide direct feedback from consumers for product or service improvements. Here are the benefits of e-WOM in more detail: Reviews and recommendations from fellow users (e-WOM) are often considered more credible than traditional advertising, thus building trust in a brand or product. The more people talk about a product or service online, the wider brand awareness is formed, which can then encourage long-term customer loyalty (Sadeli & Aritonang, 2024). e-WOM serves as social proof and a powerful source of information for potential consumers. They rely on positive reviews to assess the quality of a product before deciding to purchase. Compared to conventional marketing campaigns, e-WOM can be a more efficient and cost-effective marketing strategy, especially on social media. Through the internet and social media, e-WOM can reach a very wide audience globally in a short time, providing a significant impact on marketing efforts (Valmohammadi et al., 2025). e-WOM provides a platform for companies to obtain direct feedback from consumers, both positive and negative, which is invaluable for improving products, services, and customer experiences. Information shared through e-WOM can help companies understand consumer preferences and behavior more deeply, so that it can be used to target more specific market segments (Humairoh & Annas, 2023).

2.3 E-service quality

E-service quality is a customer's overall evaluation and assessment of the quality of services delivered via the internet, including the ability of an application or website to provide services effectively and efficiently to users during interactions. This quality is assessed based on how well the electronic service fulfills its promises, ensures user data security, and provides a quick response to problems (Zhang et al., 2021). E-service quality is the quality of services provided electronically or online through a website or application to facilitate shopping, purchasing, and delivery of goods or services effectively and efficiently. This concept is an extension of service quality and measures how users perceive their interactions with digital services, focusing on convenience, speed, fulfillment of promises, and data security. E-service quality is a customer's overall evaluation and assessment of the quality of services delivered via the internet, including the ability of an application or website to provide services effectively and efficiently to users during interactions (Singh et al., 2023). This quality is assessed based on how well the electronic service fulfills its promises, ensures user data security, and provides a quick response to problems. The main benefit of e-service quality is increased customer satisfaction, which can then lead to loyalty and repeat purchases, as well as improving the reputation and value received by customers. Good e-service quality also makes it easier and faster for consumers to access product and service information, reduces the potential for complaints, and ensures the business continues to exist in the digital era. Good e-service that meets customer expectations will create higher satisfaction, especially in terms of efficiency and ease of use. Satisfied customers tend to use the same service again and are more loyal to a brand or online platform (Purwanto, 2022). Consumers can compare the benefits obtained from e-services compared to their expectations, so good service quality will create higher value. High customer satisfaction and loyalty encourage them to make repeat purchases, which is important for business growth. Good service quality contributes to a positive company image, helps businesses compete and maintain their existence in the midst of information technology. Good e-service quality ensures customers receive complete and clear information about products and services, which also helps them make the right purchasing decisions. Fast and appropriate service in handling customer complaints can prevent bigger problems and increase trust (Nugroho & Sampurna, 2025). The primary objective of e-service quality is to create customer satisfaction (e-satisfaction) through the provision of effective, efficient, and reliable e-services, which ultimately increases customer loyalty, encourages repeat purchases, and strengthens a positive business image in the digital realm. Providing a positive experience through digital platforms, where users feel comfortable and their needs are met. Satisfied customers tend to be loyal and will return to use the e-service. Good e-service quality can encourage customers to continue transacting and purchasing products or services again. Facilitating users to carry out shopping, purchasing, and distribution activities efficiently through website or application facilities (Roslina & Mahrinasari, 2023). Maintaining customer data privacy and ensuring the system is always available and reliable for transactions and fulfilling user needs. Superior e-service quality can differentiate a company from competitors and is the key to business success in the digital world. E-commerce supported by good e-service quality opens up significant opportunities for sales growth and increased company revenue.

2.4 e-loyalty

E-loyalty is customer loyalty to a brand, store, or company online, reflected in the customer's intention to make repeat purchases, provide positive recommendations to others, and continue to choose that product or service in the future, rather than switching to another platform. It is a consumer's positive attitude or opinion toward an e-service that motivates them to

continue visiting and reusing a website or application. E-loyalty is a customer's loyalty or preference for a website or online application that encourages repeat purchases and positive recommendations for that service (Ashiq & Hussain, 2024). E-loyalty demonstrates a customer's commitment to continually return and transact on the site because they are satisfied and trust the experience provided. Good e-service quality is crucial in building e-loyalty, as it can influence customer satisfaction and trust. Customer satisfaction with the transaction experience on an online site is a crucial factor that can increase e-loyalty. Customer trust in an e-commerce site or online application is key to building loyalty. High e-loyalty can increase company profits by encouraging repeat purchases and customer retention. In the digital era, building e-loyalty has become crucial for business survival as customers now have more choices and can easily compare suppliers (Kuska et al., 2024). E-commerce loyalty programs can create interactive communities around a brand, strengthening customer relationships. The primary goal of e-loyalty is to increase repeat purchases and recommendations from loyal customers towards a brand or online platform. By creating e-loyalty, companies aim to build long-term relationships with customers, thereby reducing new customer acquisition costs, increasing sales volume and market share, and strengthening competitive advantage in a highly competitive market. E-loyalty converts behavioral intentions into repeat purchases, ensuring customers return and transact again with the same brand (Chao et al., 2024). Loyal customers are willing to recommend products or services to others, which serves as effective word-of-mouth promotion. E-loyalty is not just about transactions, but also building emotional connections and trust with customers to create engagement with the platform. Long-term customer relationships directly contribute to increased sales and company profits. Retaining existing customers is much cheaper than acquiring new ones, as e-loyalty reduces promotion and acquisition costs. In a digital market that is highly competitive and has low switching costs, e-loyalty is becoming a crucial factor in ensuring business sustainability and differentiating itself from competitors. E-loyalty programs create a win-win solution, where customers feel appreciated and businesses gain long-term trust and loyalty (Rachmawati & Syafarudi, 2022).

3. Method

This study used a quantitative approach. The population consisted of all online shop consumers, and the sample consisted of 765 online shop consumers. The sampling technique used was simple random sampling. The research instrument was a questionnaire with a 7-point Likert scale. The research variables included e-CRM (Electronic Customer Relationship Management), e-WOM (electronic word-of-mouth), e-service quality, and e-Loyalty. Data were analyzed using Partial Least Squares – Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The analysis consisted of two stages: the Outer Model (Measurement Model): Testing convergent validity, discriminant validity, and reliability. The Inner Model (Structural Model): Testing path coefficients, R^2 values, and direct effects, or hypothesis testing.

The research hypotheses are:

H₁: *E-CRM (Electronic Customer Relationship Management) has a positive relationship on e-Loyalty of online shop Consumers.*

H₂: *e-WOM (electronic word-of-mouth) has a positive relationship on e-Loyalty of online shop Consumers.*

H₃: *E-service quality has a positive relationship on e-Loyalty of online shop Consumers.*

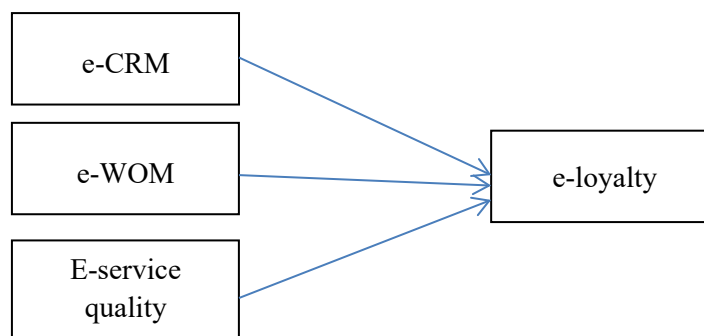


Fig. 1. Research Model

4. Result and discussion

Partial Least Square (PLS) Data Analysis Method

Convergent Validity

Convergent validity testing for reflective indicators can be conducted by evaluating the outer loading values for each construct. The recommended value to meet the validity criteria is 0.7 or higher.

Table 1
Convergent Validity Test Results

Variable	Indicator	Outer loading	Result
E-CRM	E-CRM1	0.921	Valid
	E-CRM2	0.932	Valid
	E-CRM3	0.932	Valid
	E-CRM4	0.954	Valid
	E-CRM5	0.921	Valid
e-WOM	e-WOM1	0.947	Valid
	e-WOM2	0.917	Valid
	e-WOM3	0.943	Valid
	e-WOM4	0.932	Valid
	e-WOM	0.912	Valid
E-service quality	ESQ1	0.875	Valid
	ESQ 2	0.875	Valid
	ESQ 3	0.859	Valid
	ESQ 4	0.873	Valid
	ESQ 5	0.886	Valid
e-Loyalty	EL1	0.865	Valid
	EL2	0.899	Valid
	EL3	0.875	Valid
	EL4	0.859	Valid
	EL5	0.863	Valid

Source: SmartPLS 4.1.0.9. Output (2025)

All indicators meet the required loading factor (>0.7), confirming their convergent validity for further analysis. The outer loadings for E-CRM (Electronic Customer Relationship Management), e-WOM (electronic word-of-mouth), E-service quality, e-Loyalty exceed this threshold. Additionally, convergent validity is supported by the Average Variance Extracted (AVE), which should be >0.5 to indicate that over 50% of variance is explained by the construct.

e-Loyalty	0.765	Valid
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Source: SmartPLS 4.1.0.9. Output (2025)

The convergent validity test confirms that all constructs meet the AVE criterion (>0.50), ensuring validity for further analysis. These results indicate that each construct explains more than 50% of the variance in its indicators, validating their reliability.

Discriminant Validity

The next step is to evaluate discriminant validity using the Fornell-Larcker Criterion. This involves comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlation values between constructs in the model. This method ensures that each construct is empirically distinct from others in the research model.

Table 3

e-Loyalty	0.627	0.638	0.027	0.954
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Source: SmartPLS 4.1.0.9. Output (2025)

The discriminant validity test using the Fornell-Larcker Criterion shows that the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlations with other constructs. Additionally, the Heterotrait-Monotrait Ratio (HTMT) values, all below 0.90, further validate discriminant validity, as recommended by Hair et al. (2022).

Table 4

e-Loyalty	0.637	0.652	0.045
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Source: SmartPLS 4.1.0.9. Output (2025)

Another method to assess discriminant validity is by examining reflective indicators using cross-loadings, as recommended by Hair et al. (2022). Each variable should have a loading value greater than 0.70. This approach evaluates discriminant validity at the item level, ensuring that an indicator has the highest loading factor for the construct it measures compared to other constructs. This confirms that the latent construct is more effective at predicting indicators within its block than those in other blocks.

Reliability

e-Loyalty	0.975	0.975
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Source: SmartPLS 4.1.0.9. Output (2025)

The reliability test results show that all variables have Cronbach’s Alpha and Composite Reliability values exceeding the 0.7 threshold, indicating good reliability for all constructs in this study. Since all constructs meet the reliability criteria, the measurement instruments used in this study are consistent and trustworthy for measuring the variables.

Structural Model Evaluation (Inner Model)

R-Square (R²) Value

The R-Square (R²) coefficient measures how well exogenous variables explain the variability of endogenous variables, with values ranging from 0 to 1. A value closer to 1 indicates better explanatory power and stronger prediction of the endogenous variable’s variation. Conversely, a smaller R² value suggests limited explanatory ability. However, R² tends to increase with the addition of exogenous variables, even if they have no significant effect on the endogenous variable. Hair et al. (2017) classify R² values as substantial (≥0.67), moderate (≥0.33), and weak (≥0.19).

Table 6

e-Loyalty	0.746	Substantial
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Source: SmartPLS 4.1.0.9. Output (2025)

The R-Square (R²) values indicate a Substantial predictive ability for the endogenous variables in this study. e-Loyalty has an R² of 0.746, with exogenous variables accounting for 74.6% of its variability and the remaining 25.4% attributed to external factors. These findings suggest that while the model provides substantial explanatory power, additional factors contribute to variations in the endogenous variables.

Construct Cross-Validation Redundancy Testing Results

Predictive Relevance (Q²) assesses the model’s ability to generate accurate observed values for endogenous variables. It applies only to models with endogenous factors. A Q² value greater than 0 indicates that the model has predictive relevance, while a value of 0 or negative suggests poor predictive ability.

e-Loyalty	0.604	Has relevant predictive value
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Source: SmartPLS 4.1.0.9. Output (2025)

The Predictive Relevance (Q²) calculation shows a value of 0.604 for e-Loyalty and 0.570 for Job Satisfaction. This suggests that the exogenous variables effectively predict the endogenous variables, making the model appropriate for further analysis.

Effect Size (F²) Value

F-Square (F²) measures the relative impact of an exogenous variable on an endogenous variable, indicating the strength of the relationship. an F² value of 0.02 represents a small effect, 0.15 indicates a moderate effect, and 0.35 signifies a large effect. The F² values obtained from the data processing results are presented in the following table:

Table 8

E-service quality → e-Loyalty Source: SmartPLS 4.1.0.9. Output (2025)	1.333	Strong
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The Effect Size (F²) test results indicate that most relationships between. This suggests that while the relationships are statistically significant, their overall contribution to changes in the endogenous variables is relatively good.

Model Fit Test

Model fit evaluation in this study was conducted using two testing methods: Standardized Root Mean Square Residual (SRMR) and Normal Fit Index (NFI). The results of the model fit test are presented in the following table:

Table 9

NFI	0.876
Source: SmartPLS 4.1.0.9. Output (2025)	

The model fit test results show an SRMR value of 0.036, meeting the good fit criterion (<0.08) . However, the NFI value is 0.876, below the recommended threshold of 0.90, indicating a suboptimal fit. model is acceptable if at least one fit criterion is met. Since the SRMR value satisfies this condition, the model is deemed fit for further analysis.

Collinearity Statistic (VIF) Results

Before testing the structural model, it is necessary to evaluate the potential multicollinearity between variables, which can be analyzed using the Inner VIF (Variance Inflation Factor) statistic. The VIF test results are presented in the following table:

Table 9
Variance Inflation Factor (VIF) Test Results

	Direct Effect	VIF
E-CRM → e-Loyalty		3.940
E-WoM → e-Loyalty		2.325
E-service quality → e-Loyalty		1.001
Source: SmartPLS 4.1.0.9. Output (2025)		

The Collinearity Statistic (VIF) test results confirm that all VIF values are below the threshold of 5, ranging from 1.001 to 3.940. This indicates no significant multicollinearity issues among the variables, ensuring that the model estimation remains robust and unbiased. Thus, the structural model is suitable for further analysis.

Hypothesis Test Results

The hypothesis testing results, obtained through the Bootstrapping procedure, assess whether the proposed hypotheses are accepted or rejected. According to Hair et al. (2022), path coefficient values range from -1 to +1, where values closer to +1 indicate a strong positive relationship, and values closer to -1 indicate a strong negative relationship. The hypothesis is accepted if the T-Statistic value exceeds ±1.96; otherwise, it is rejected, meaning the null hypothesis (H0) is accepted. The detailed hypothesis test results are presented in the following table:

Table 10

H3	E-service quality → e-Loyalty	0.582	0.042	13.869	0.000
Source: SmartPLS 4.1.0.9. Output (2025)					

Based on the results of the SmartPLS analysis, the p -value was $0.000 < 0.050$, so it was concluded that there was a significant relationship. E-CRM (Electronic Customer Relationship Management) and e-Loyalty of Online Shop Customers. The relationship between e-CRM (electronic customer relationship management systems) and e-loyalty is positive and significant, where effective e-CRM implementation will increase customer e-loyalty. E-CRM enables companies to manage customer interactions through digital technology, analyze customer data to understand their preferences, and provide personalized services and communications, all of which contribute to improved customer experience and satisfaction, thus fostering long-term loyalty (Melani, 2021). E-CRM enables businesses to collect and analyze customer data, enabling offers and communications tailored to individual needs. This creates a more personalized and relevant experience for customers, making them feel valued. With an e-CRM system, companies can interact with customers more efficiently and effectively through various digital channels, such as websites and apps. This strengthens the relationship between brands and customers. Better interaction management and personalized services ultimately increase customer satisfaction. Satisfied customers tend to be more loyal. E-CRM helps businesses retain customers by providing consistent and positive experiences, leading to increased customer retention (Gulati et al., 2023). E-CRM provides tools for analyzing customer data to understand their trends and preferences. This information can be used to improve products, services, and marketing strategies, all of which support customer loyalty. In short, e-CRM acts as a foundation that enables businesses to build strong relationships with their customers in the digital realm, and higher customer loyalty is a result of successful e-CRM efforts (Rachmawati & Syafarudi, 2022).

The relationship between e-CRM (Electronic Customer Relationship Management) and e-loyalty is a positive and significant one, where good and effective e-CRM implementation will increase customer e-loyalty directly and indirectly through improved customer experience (Ashiq & Hussain, 2024). E-CRM provides personalized data and interactions, which then shape positive experiences for customers, make them feel valued, and ultimately drive their loyalty to a brand or digital platform. E-CRM collects and analyzes customer data to understand their preferences and behaviors. This information is then used to provide personalized communications, offers, and experiences, making customers feel more cared for and appreciated. These personalized interactions directly improve the overall customer experience. Consistent positive experiences will make customers more satisfied and more likely to remain loyal. E-CRM can directly increase customer loyalty by building closer and more effective relationships, whether through loyalty programs, timely communication, or responsive customer service. Good e-CRM also contributes to customer satisfaction (Wani et al., 2023). This satisfaction then becomes an important factor that influences customers' decisions to continue using the same service or product and avoid switching to competitors. E-CRM is the foundation for creating e-loyalty. By utilizing technology to manage customer relationships digitally, companies can provide better and more personalized experiences, which will naturally result in higher customer loyalty in the digital era (Anser et al., 2023). E-CRM (Electronic Customer Relationship Management) has a positive and significant relationship with e-loyalty, which means that good e-CRM implementation can increase customer loyalty in the digital world. By managing customer interactions through technology, e-CRM helps companies build stronger relationships, increase satisfaction, and ultimately encourage customers to remain loyal to brands or services on online platforms. E-CRM tracks customer interactions and enables businesses to provide effective and integrated customer support. This creates a better experience for customers, which contributes to their satisfaction and loyalty. With E-CRM, companies can interact with customers personally, understand their needs, and offer appropriate solutions. This can increase customer trust in the company, which is an important foundation for loyalty (Melani, 2021).

e-WOM (electronic word-of-mouth) and e-loyalty of online shop customers

Based on the results of the SmartPLS analysis, the p -value was $0.000 < 0.050$, so it was concluded that there was a significant relationship. The relationship between e-WOM (electronic word-of-mouth) and e-loyalty is positive and significant. E-WOM, particularly positive reviews and recommendations from other online customers, can increase customer trust and satisfaction, ultimately encouraging repeat purchases and brand recommendations (Anser et al., 2023). In other words, the more positive e-WOM a product or service receives, the higher the level of e-loyalty it forms. Potential customers trust information from other consumers through e-WOM more easily than marketing information from the company itself. This established trust forms the foundation for loyalty. Positive e-WOM information helps consumers make better purchasing decisions, thereby increasing their satisfaction with the product or service. This satisfaction is a key prerequisite for loyalty (Wani et al., 2023). When consumers feel confident in a product or service thanks to positive e-WOM, they are more likely to purchase that product or service again in the future. Positive e-WOM not only influences buyers but also encourages satisfied customers to recommend a product or service to others, ultimately expanding reach and increasing overall loyalty. For e-commerce businesses, managing e-WOM is an effective marketing strategy for building and maintaining e-loyalty. Companies can strengthen trust-based strategies and customer experience to generate positive reviews and indirectly increase customer loyalty in the online environment (Kuska et al., 2024).

The relationship between eWOM (Electronic Word of Mouth) and e-Loyalty is positive, where good and positive eWOM will increase customer e-loyalty, which is characterized by repeat purchases and product/service recommendations to others via the internet. Furthermore, eWOM can increase e-trust, which is then an important predictor in shaping customer e-loyalty. eWOM is a positive or negative statement that consumers convey online about a product or service (Ashiq & Hussain, 2024). Positive e-WOM creates a favorable perception of the brand and product in the eyes of other consumers, and it is highly

credible because it comes from a trusted source. Consumers are more likely to trust information from other consumers who are considered trustworthy, such as friends or family, which then builds E-Trust or electronic trust. Strong E-Trust, which is built through positive EWOM, then significantly influences E-Loyalty. E-Loyalty is an attitude to continue purchasing the same product or service and recommending it to others. Good EWOM will form strong brand equity in the eyes of consumers, thereby increasing consumer loyalty to the product. A study found that EWOM has a positive and significant relationship with brand equity and consumer loyalty, where good EWOM creates good brand equity so that consumers become loyal. Other studies show that E-Trust, which is influenced by E-WOM, has a very substantial impact in explaining variations in customer E-Loyalty (Wani et al., 2023). There is a positive and significant relationship between e-WOM (Electronic Word-of-Mouth) and e-loyalty; positive reviews from other customers through digital platforms can influence consumer trust and satisfaction, which ultimately encourages their loyalty to make repeat purchases and recommend the product or service (Khan et al., 2023). Positive information or reviews shared through e-WOM can build customer trust in a product or service. These positive reviews often leave customers satisfied with their experience, as they feel they are receiving useful and objective information from fellow users. Satisfied and trusting customers are more likely to make repeat purchases. The satisfaction and loyalty generated by positive e-WOM also make customers more likely to recommend the product or service to others. Consumers tend to pay more attention to reviews from users perceived as having a good reputation or relevant experience. The delivery of e-WOM requires intermediaries such as the internet, social media, or online reviews (Chao et al., 2024).

E-service Quality and E-Loyalty of Online Shop Customers

Based on the results of the SmartPLS analysis, the p-value was $0.000 < 0.050$, so it was concluded that there was a significant relationship. The relationship between e-service quality and customer loyalty is generally positive and significant, where improving e-service quality will increase customer loyalty because positive experiences can build customer trust and satisfaction (Eryiğit & Fan, 2021). Good service quality can encourage customers to reuse a service and recommend it to others, and can also be a mediating factor that strengthens the relationship between e-service quality and loyalty. How E-Service Quality Affects Customer Loyalty. When a company is able to meet or even exceed customer expectations in terms of e-service quality, it can create a positive experience. This positive experience directly contributes to building customer trust in the e-service provided. Good service quality also increases customer satisfaction, which is an important key in maintaining positive customer relationships. Satisfied and trusting customers are more likely to reuse the product or service offered, thereby increasing their loyalty. Customer satisfaction often acts as a mediating variable, meaning that e-service quality does not directly affect loyalty, but rather through customer satisfaction (Umah et al., 2024). In general, improving the quality of e-services (such as ease of use, information accuracy, and responsiveness) will have a significant positive impact on customer loyalty. Companies need to focus on providing good e-service quality to build trust, satisfaction, and ultimately, sustained customer loyalty. The relationship between e-service quality and e-loyalty is generally positive and significant, meaning that improving e-service quality tends to increase customer loyalty. However, several studies also suggest that this influence can occur indirectly through customer satisfaction (e-satisfaction) or trust (e-trust) as mediating variables. Good e-service quality can directly build positive customer experiences, which can then lead to trust, repeat visits, and ultimately customer loyalty. Good service quality tends to create customer satisfaction, and this satisfaction is then key to building customer loyalty. High e-service quality can also increase customer trust in a platform or company, which in turn can increase e-loyalty. In-app service quality, such as accurate wait time estimates or a streamlined ordering process, can increase user loyalty (Hassan, 2024).

The relationship between e-service quality and e-loyalty is generally positive and significant, meaning that good e-service quality will increase online customer loyalty. However, research results can vary depending on the industry context and research object, where some studies show a significant direct effect, and others find that e-service quality affects e-loyalty through mediating variables such as e-satisfaction or e-trust. Many studies show that increasing e-service quality will directly increase e-loyalty. This means that customers will be more loyal if they receive good e-service quality and exceed their expectations (Luthfi et al., 2025). Some studies also found that e-service quality does not directly affect e-loyalty, but through intermediary variables such as e-satisfaction or e-trust. When e-service quality meets or exceeds customer expectations, it can create a positive experience that results in satisfaction. This satisfaction can then build long-term loyalty. Good service quality can also increase customer trust in online platforms or companies. This trust is an important foundation in building e-loyalty. Differences in results between studies are often due to the different research subjects, such as users of meditation apps versus users of e-commerce platforms like online shop. The industry and customer characteristics in each study can also influence how e-service quality translates into loyalty.

5. Conclusion

The results of this study indicate that e-CRM (Electronic Customer Relationship Management) has a positive relationship with e-loyalty of online shop customers, e-WOM (electronic word-of-mouth) has a positive relationship with e-loyalty of online shop customers, and e-service quality has a positive relationship with e-loyalty of online shop customers. Positive e-WOM has a strong impact on shaping consumer perceptions, attitudes, and purchasing decisions. Thus, e-WOM is a key factor that can help companies maintain and increase customer loyalty in the digital era. Implications for Business: Companies need to focus on improving the quality of their e-services, as this can have a direct impact on customer loyalty through

satisfaction and trust. Good e-service quality, such as ease of transactions and data security, can influence the level of loyalty of digital banking customers. In general, e-service quality is a crucial factor in building e-loyalty. Companies need to focus on improving the quality of their e-services, both to create immediate customer satisfaction and trust and as a foundation for long-term loyalty. E-CRM helps businesses identify new sales opportunities and improve customer retention by providing better, more relevant solutions. A strong relationship with customers can create more value for them than competing solely on price or features. This makes customers more likely to remain loyal. Optimal e-CRM implementation through an app or website can enhance the overall user experience, ultimately driving e-loyalty.

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