AI in E-Commerce: The Role Of Service Quality and User Preference in Driving Customer Engagement Across Digital Marketplaces

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Abstract. Centred on the Indonesian context, this study probes how the quality of AI-enabled services drives customer engagement on e-commerce platforms. Worldwide adoption of chatbots and recommendation engines is now commonplace, yet operators across emerging markets continue to find hyper-personalised and frictionless journeys difficult to achieve. To address this gap, the analysis builds around five focal constructs, AI Service Quality Performance, AI Information Quality, AI System Quality, Customer Satisfaction, and Customer Engagement, and tests six hypotheses on a sample of 96 active users of AI-driven e-commerce services using a quantitative, explanatory design and Partial Least Squares Structural Equation Modeling (SEM-PLS). Two clear patterns emerge from the estimation. First, AI service performance produces significant gains in both information quality and system quality; second, those two constructs jointly raise customer satisfaction, which then translates into stronger engagement. Interestingly, the direct path from AI service performance to satisfaction did not reach significance, implying that its influence travels indirectly through information and system quality. For practitioners, the findings supply actionable guidance on refining AI-mediated experiences and lifting engagement. Future work might extend the model through longitudinal designs, cross-national comparisons, and the inclusion of constructs such as AI trust and data-privacy concerns.

Keywords: AI Service Quality, Customer Engagement, E-Commerce, Customer Satisfaction, AI System Quality.

1 INTRODUCTION

Competition in e-commerce is being reshaped as advanced artificial intelligence (AI) instruments, chiefly chatbots and recommendation engines, become embedded in everyday customer-service workflows. Real-time, automated dialogue with shoppers is increasingly delegated to chatbots that answer queries and provide support, while recommendation engines analyse behavioural traces to deliver product suggestions tailored to each user. The combined effect of these capabilities is to produce

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personalised journeys that match consumer expectations and translate into measurable business gains [1], [2]. In the Indonesian setting, this trajectory is reflected in headline figures: GMV climbed from USD 21 billion in 2019 to an estimated USD 68 billion by 2024, and AI coverage rose from a low base to roughly 50% market penetration over that span.

Underpinning this shift is the premise that the quality of AI-mediated service is a primary determinant of customer satisfaction and loyalty. A growing body of empirical evidence demonstrates that high-quality, personalised AI interactions can substantially lift engagement, with documented sales-conversion uplifts reaching as much as 20% [3]. The conceptual frame employed in this paper rests on consumer-behaviour theorising about service quality, in which the performance of AI services is treated as a central antecedent of both technology preferences and active customer participation [4]–[7]. Against this backdrop, the present study examines the direct relationships connecting AI service performance, AI information quality, AI system quality, customer satisfaction, and customer engagement within e-commerce.

Specifically, two research questions guide the inquiry: whether AI service performance materially affects how users perceive the quality of AI-generated information and the dependability of the AI system, and whether AI information quality and AI system quality, in turn, drive customer satisfaction.

To investigate these relationships, we propose a conceptual model with six hypotheses:

H1: AI Service Performance has a positive effect on AI Information Quality.
H2: AI Service Quality Performance has a positive effect on AI System Quality.
H3: AI Information Quality has a positive effect on Customer Satisfaction.
H4: AI System Quality has a positive effect on Customer Satisfaction.
H5: AI Service Quality has a positive effect on Customer Satisfaction.
H6: Customer Satisfaction has a positive effect on Customer Engagement.

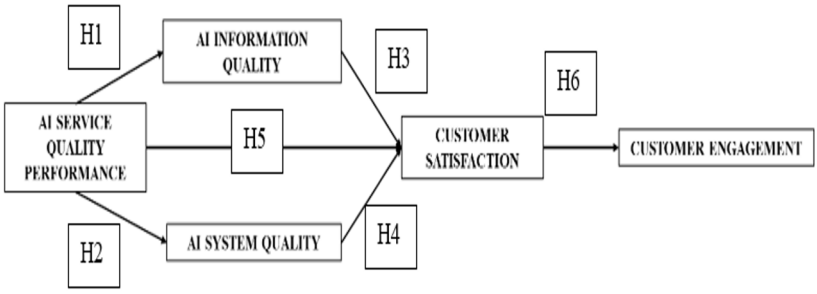

Figure. 1. Research Model

2 METHODS

An explanatory, quantitative methodology underpins this study. Data were gathered through an online questionnaire built around Likert-scale items, distributed to 96 active users of AI-enabled e-commerce platforms who were selected via purposive sampling; required sample size was determined using the Cochran formula. To examine the proposed effects of AI service quality, information quality, system quality, and customer satisfaction on customer engagement, the data were modelled using Partial Least Squares Structural Equation Modeling (SEM-PLS).

3 Results and Discussion

3.1 Respondents' Demographic Profile

A closer look at the demographic data reveals that respondents skew toward early-career adults: 35.4% fell within the 29–31 bracket and a further 32.3% within the 26–28 range. Female participants formed the larger share of the sample at 58.3%, and educational attainment was high overall, with 74% holding at least a bachelor's-level qualification. On the financial side, more than half of the respondents earned in excess of Rp5,000,000 per month, evidence of meaningful purchasing capacity. Platform-use patterns place Shopee at the top (34.4%), trailed by TikTok Shop (16.7%) and Tokopedia (14.6%); the distribution points to a sample that interacts heavily with mobile-first e-commerce ecosystems.

3.2 Test of Hypotheses

To probe the relationships posited among the latent constructs, structural path analysis was carried out in SmartPLS using a bootstrapping routine. The procedure yields, for each path, indicators that allow the direction, magnitude, and statistical significance of the effect to be evaluated, namely path coefficients (original sample values), standard deviations (STDEV), t-statistics, and p-values. Consistent with the conventional decision rule, a path is considered statistically significant when its t-value surpasses 1.96 at the 5% level ($p < 0.05$).

The first hypothesis posits a positive influence of AI Service Quality Performance on AI Information Quality. Estimation results clearly support this proposition: the path is both strong and statistically significant, with a coefficient of 0.721, a t-statistic of 11.458, and a p-value of 0.000. From a practitioner standpoint, the result indicates that as the platform's broader AI service performance improves, users substantially upgrade their assessment of the information generated. AI services that operate effectively tend to deliver information characterised by accuracy, relevance, and timeliness, qualities that align closely with users' expectations and cognitive requirements. This finding is consistent with prior research [8], [9], which confirms that when users perceive AI

services positively, their confidence in the dependability and accuracy of the information generated rises in tandem.

Hypothesis 1 is accepted

Hypothesis 2 turns to the influence of AI Service Quality Performance on AI System Quality. Empirical estimates confirm a positive, significant effect; the path coefficient stands at 0.469, paired with a t-statistic of 4.382 and a p-value of 0.000. The interpretation is that the broader quality of AI-driven service offerings substantively reinforces system attributes such as functionality, reliability, and responsiveness. Put differently, gains in service-level execution translate into more favourable user assessments of the AI system's underlying technical soundness. Achieving consistently strong AI service performance is impossible without a high-quality supporting system, judged on dimensions that include speed of access, accuracy of analytic processing, and the flexibility with which the platform adapts to evolving patterns of user behaviour [10], [11].

Hypothesis 2 is accepted.

For the third hypothesis, attention shifts to the relationship between AI Information Quality and Customer Satisfaction. The estimation reports a significant positive coefficient of 0.410, supported by a t-statistic of 2.995 and a p-value of 0.003. Read together, the results indicate that satisfaction is meaningfully driven by the quality of information AI platforms supply, taking in dimensions such as clarity, credibility, and how useful that information proves when users make decisions. When examining the antecedents of customer satisfaction, the quality of information generated by AI-based platforms emerges as a foundational pillar [12], [13]. This finding is supported by recent empirical work [14], which indicates that AI-generated content functions both as a decision-support mechanism and as a leading driver of satisfaction within digital commerce.

Hypothesis 3 is accepted.

Whether AI System Quality plays a meaningful role in shaping Customer Satisfaction is the focus of Hypothesis 4. The empirical evidence affirms that it does: estimates yield a path coefficient of 0.357, with a t-statistic of 3.153 and a p-value of 0.002. The result reinforces the proposition that an AI system delivering stability, speed, and accuracy raises satisfaction precisely by smoothing the user journey and trimming away operational friction. Customers' comfort and satisfaction during interactions with AI services depend directly on how well the underlying system is engineered. Clear architecture, ease of use, and prompt responsiveness to user input all combine to lift the effectiveness of digital exchanges [15], [16]. Technical system attributes, covering speed, reliability, and accessibility, have been shown to meaningfully shape Customer Satisfaction [12], reducing user frustration and building coherent journeys that cultivate satisfaction [17].

Hypothesis 4 is accepted.

Hypothesis 5 tests the direct route from AI Service Quality Performance to Customer Satisfaction. Contrary to what was anticipated, no statistically significant relationship emerges: the path coefficient is just 0.069, the t-statistic 0.557, and the p-value 0.578. Taken together, the figures suggest that while service performance is consequential for information quality and system quality, its effect on satisfaction does not register directly unless mediated through other constructs. The mechanism through which service performance ultimately reaches satisfaction therefore appears indirect and more nuanced than a simple causal arrow would imply. A meaningful share of the work in generating a positive, satisfying customer experience falls to the performance of AI services; however, this influence appears to operate primarily through improvements in information and system quality rather than as a direct effect.

Hypothesis 5 is rejected.

The final hypothesis examines whether Customer Satisfaction translates into Customer Engagement. The evidence is unambiguous in the affirmative: estimates show a path coefficient of 0.540, a t-statistic of 6.326, and a p-value of 0.000. In substantive terms, customers who report being satisfied with the AI-mediated service experience are markedly more likely to remain engaged with the platform on a consistent basis, sustaining ongoing interaction, loyalty, and emotional investment over time. Across diverse digital touchpoints, the level of satisfaction customers report serves as a primary trigger for active participation. Once satisfied, users are far more likely to behave constructively, posting reviews, sharing their experiences, and recommending the service to people in their networks [18], [19]. This finding is congruent with prior work [20], which frames satisfaction as a strong precursor to loyalty, sustained usage, and ongoing interaction in AI-mediated environments.

Hypothesis 6 is accepted.

4 RESULTS AND DISCUSSION

Two constructs, AI information quality and AI system quality, emerge from this study as meaningful drivers of customer satisfaction, with that satisfaction subsequently feeding stronger customer engagement. In contrast, AI service quality performance does not influence satisfaction along a direct route; its effect surfaces only indirectly, channelled through improvements in information and system quality. Read collectively, the findings highlight that AI-generated information accuracy and AI system reliability are pivotal levers in shaping how satisfied and engaged users feel on e-commerce platforms.

The sample skewed toward respondents aged 26–31 with strong educational backgrounds and moderate-to-high purchasing power, a demographic that fits the conventional picture of digitally fluent Indonesian e-commerce participants. Descriptive readings further suggest that AI performance was generally well received, with particularly positive ratings on dimensions tied to informational accuracy, system dependability, and engagement-related features.

Future studies might leverage longitudinal frameworks to chart how user perceptions shift over extended periods, or undertake cross-platform comparisons spanning Shopee, TikTok Shop, and similar marketplaces. Other promising directions involve enriching the model with additional variables, including AI trust, perceived risk, and concerns surrounding data privacy. Testing the framework across diverse cultural or national contexts would, in addition, expand the external validity of the conclusions reported in this paper.

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