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The Role of Marketing Strategy and Artificial Intelligence on Operational Performance with Trust as a Mediating Variable: A Study on Postgraduate Students at Balikpapan University

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ABSTRACT

This study analyzes the influence of Marketing Strategy and Artificial Intelligence on Operational Performance with Trust as a mediating variable among postgraduate students at Universitas Balikpapan. A quantitative explanatory design was applied. Data were collected from 32 postgraduate students who actively use digital academic services through structured questionnaires. The analysis employed Structural Equation Modeling–Partial Least Squares (SEM-PLS) using SmartPLS 4. The results show that Artificial Intelligence has a positive and significant effect on Trust ($p<0.05$), and Trust significantly affects Operational Performance ($p<0.05$). However, Marketing Strategy does not significantly influence Trust or Operational Performance. In addition, Artificial Intelligence has no direct significant effect on Operational Performance. Mediation analysis indicates that Trust significantly mediates the relationship between Artificial Intelligence and Operational Performance, but does not mediate the effect of Marketing Strategy on Operational Performance. These findings highlight Trust as a key determinant in translating Artificial Intelligence adoption into improved Operational Performance in higher education contexts.

INTRODUCTION

Digital transformation has fundamentally reshaped organizational operations across sectors, including higher education, through technologies such as Artificial Intelligence (AI), big data, cloud computing, and automation, which enhance efficiency, service quality, and competitiveness. AI is increasingly recognized as a strategic resource capable of supporting data analysis, prediction, decision-making, and process automation. The McKinsey Global Survey on Artificial Intelligence (2024) reports a rise in AI adoption from about 50% in 2023 to over 70% in 2024, while Statista (2025) highlights continuous global growth in AI investment and utilization. UNESCO (2023) further emphasizes AI's role in improving

education through personalized learning, intelligent tutoring systems, and administrative automation.

In Indonesia, digital transformation is a national priority, supported by internet penetration exceeding 79% (APJII, 2024), encouraging universities to integrate digital technologies into academic services. Alongside technological advancement, marketing strategy remains crucial in shaping institutional reputation, communication, and trust (Amin et al., 2022).

However, empirical findings on AI and marketing strategy effects on performance remain inconsistent (Dwivedi et al., 2023; Zhang et al., 2023; Lee & Chen, 2024). Based on Commitment-Trust Theory (Morgan & Hunt, 1994), trust plays a central role in reducing uncertainty and strengthening relationships between technology, strategy, and performance.

Research gaps show limited studies in higher education contexts, particularly those positioning trust as a mediating variable. Therefore, this study examines the effect of Marketing Strategy and Artificial Intelligence on Operational Performance with Trust as a mediator among postgraduate students at Universitas Balikpapan. The novelty lies in positioning trust as a key mechanism linking AI and marketing strategy to operational performance in higher education.

Marketing strategy enhances organizational performance through customer engagement, value creation, and efficient resource allocation. In digital contexts, it supports better understanding of user needs and service personalization. Previous studies indicate that marketing strategy influences operational performance through improved efficiency and responsiveness (Kotler & Keller, 2022; Nguyen et al., 2023).

H1: Marketing Strategy affects Operational Performance

Artificial Intelligence improves organizational performance through automation, predictive analytics, and data-driven decision-making. It helps optimize processes, reduce errors, and improve service quality. Empirical studies show that AI adoption influences operational performance through increased efficiency and productivity (Zhang et al., 2023; McKinsey, 2024).

H2: Artificial Intelligence affects Operational Performance

Marketing strategy in digital environments shapes user perceptions through transparency, personalization, and consistent brand experience. It contributes to the development of trust by improving credibility and user satisfaction (Huang & Benyoucef, 2021).

H3: Marketing Strategy affects Trust

The implementation of Artificial Intelligence influences trust depending on perceived reliability, transparency, and system accuracy. Reliable AI systems tend to strengthen user trust (Lee & Chen, 2024).

H4: Artificial Intelligence affects Trust

Trust plays a key role in technology adoption and organizational processes by encouraging system use, collaboration, and reducing resistance. It contributes to improved operational performance through higher acceptance and utilization (Gefen et al., 2003; Wang et al., 2022).

H5: Trust affects Operational Performance

Trust strengthens the relationship between technology adoption and organizational outcomes by reducing uncertainty and increasing acceptance. It acts as a mechanism linking AI and marketing strategy to performance outcomes (Rousseau et al., 1998; Lee & Chen, 2024).

H6: Trust mediates the relationship between Marketing Strategy and Operational Performance

H7: Trust mediates the relationship between Artificial Intelligence and Operational Performance

RESEARCH METHODS

This study employed a quantitative approach with an explanatory design to examine the influence of Marketing Strategy and Artificial Intelligence on Operational Performance, with Trust as a mediating variable among postgraduate students at Universitas Balikpapan. The approach was selected to test causal relationships using statistical analysis (Creswell & Creswell, 2018). The population consisted of active postgraduate students, selected through purposive sampling based on three criteria: active status, use of digital academic services, and willingness to participate. A total of 32 valid responses were analyzed, which is appropriate for PLS-SEM in small-sample predictive research (Hair et al., 2021).

Data were collected using a structured online questionnaire with a 5-point Likert scale, adapted from previous studies and adjusted to the higher education context. Data analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4, which is suitable for complex models and does not require multivariate normality (Hair et al., 2021).

The analysis included measurement model evaluation (validity and reliability), structural model assessment (R^2, f^2, Q^2), and hypothesis testing using bootstrapping with 5,000 resamples. Hypotheses were accepted when t-statistic > 1.96 and p-value < 0.05 (Hair et al., 2021). The mediating role of Trust was examined using indirect effects and Variance Accounted For (VAF) to assess mediation strength (Preacher & Hayes, 2008).

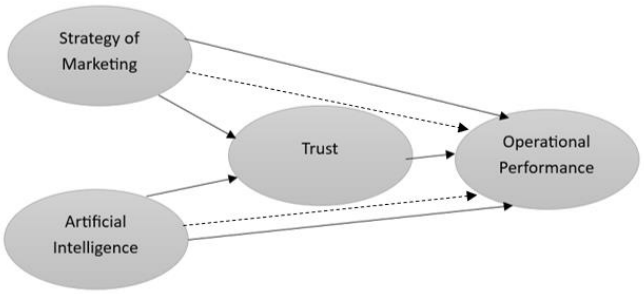

Figure 2. Conceptual Research

RESULTS AND DISCUSSION

Research results

This section presents respondent characteristics and SEM-PLS analysis results using SmartPLS 4, including measurement model evaluation (validity and reliability), structural model assessment (R^2, f^2, and VIF), and hypothesis testing via bootstrapping. It also reports indirect effect analysis to examine the mediating role of Trust in the research model.

Tabel 1. *Responden Characteristic*

Variable	Category	Frequency (n=32)	Percentage (%)
Gender	Female	21	65.6%
	Male	11	34.4%
Age	< 25 years	2	6.3%
	25–30 years	10	31.3%
	31–40 years	11	34.4%
	> 40 years	9	28.1%
Study Program	Master of Management	30	93.8%
	Master of Law	2	6.2%
Total		32	100%

Source : Primary Data (2026)

Based on Table 1, out of the 32 research respondents, the majority are female (65.6%), with a dominance of those aged 31–40 years (34.4%), and most originate from the Master of Management Program (93.8%). Overall, the respondents' characteristics indicate that the sample is dominated by productive-aged individuals with relevant educational backgrounds; thus, it is considered representative to illustrate the research phenomenon concerning digital technology utilization and operational performance.

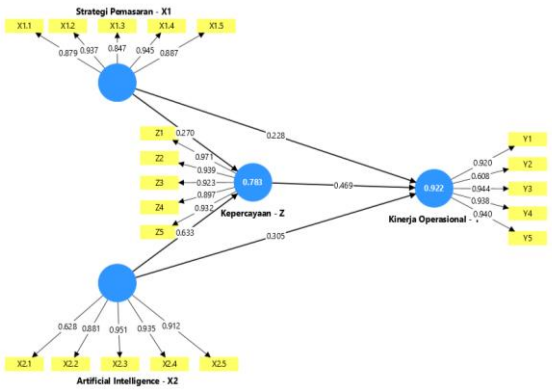

Figure 1. Model of Structural SEM-PLS Results

Figure 1 presents the analytical results of the SEM-PLS testing, which encompasses descriptive analysis, as well as the evaluation of both the measurement model (outer model) and the structural model (inner model)

Tabel 2. *Convergent Validity Test Result (Outer Loadings)*

Construct	Indicator	Loading	Decision
Strategic Marketing - X1	X1.1–X1.5	0.847–0.945	Valid
Artificial Intelligence - X2	X2.1–X2.5	0.628–0.951	1 marginal
Operational Performance - Y	Y1–Y5	0.608–0.944	1 marginal
Trust - Z	Z1–Z5	0.897–0.971	Valid

Source : Primary Data (2026)

Based on Table 2, the convergent validity test results through outer loading values indicate that all indicators for the variables of Marketing Strategy (X1), Artificial Intelligence (X2), Operational Performance (Y), and Trust (Z) generally exhibit loading values above 0.70, thereby declaring them valid. Nevertheless, there are a few indicators with marginal values, specifically X2.1 (0.628) and Y2 (0.608), which remain acceptable for further analysis as they still provide a theoretical contribution to the measured construct

Tabel 3. *Construct Reliability and Validity Test Results*

Variabel	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	AVE
Strategic Marketing (X1)	0,941	0,946	0,955	0,810
Artificial Intelligence (X2)	0,915	0,943	0,938	0,756
Operational Performance (Y)	0,922	0,952	0,944	0,774
Trust (Z)	0,962	0,963	0,971	0,870

Source : Primary Data (2026)

Table 3 shows that all constructs—Marketing Strategy (X1), Artificial Intelligence (X2), Operational Performance (Y), and Trust (Z)—have Cronbach's Alpha and Composite Reliability values above 0.70, meeting excellent reliability standards. Furthermore, all

Average Variance Extracted (AVE) values exceed 0.50, confirming adequate convergent validity. Thus, all variables are declared reliable and valid for subsequent structural model analysis.

Tabel 4. *Fornell-Larcker Criterion*

Variabel	Strategic Marketing (X1)	Artificial Intelligence (X2)	Operational Performance (Y)	Trust (Z)
Strategic Marketing (X1)	0,900	0,906	0,900	0,844
Artificial Intelligence (X2)	0,906	0,870	0,923	0,878
Operational Performance (Y)	0,900	0,923	0,880	0,929
Trust (Z)	0,844	0,878	0,929	0,933

Source : Primary Data (2026)

Based on Tabel 4, the diagonal values representing the square root of AVE range from 0.870 to 0.933. the results indicate strong correlations among the constructs, particularly between Artificial Intelligence, Trust, and Operational Performance. This finding suggest that the construct are closly related conceptually, which is consistent with the proposed research model. Therefore, the constructs were retained for subsequent structural model analysis.

Tabel 5. *Inner VIF Values*

Variabel	Trust (Z)	Operational Performance (Y)
Strategic Marketing (X1)	5,930	5,593
Artificial Intelligence (X2)	7,439	5,593
Trust (Z)	–	4,612

Source : Primary Data (2026)

Based on Table 5, the collinearity test using Variance Inflation Factor (VIF) shows that all VIF values among the variables are below the recommended threshold of 10. This indicates no serious multicollinearity issues in the model. Therefore, the relationships between the independent variables (Marketing Strategy and Artificial Intelligence) and the endogenous variables (Trust and Operational Performance) can be further analyzed validly in the structural model.

Tabel 6. *R Square Results*

Construct	R-square	R-square adjusted
Operational Performance – Y	0.875	0.866
Trust – Z	0.785	0.770

Source : Primary Data (2026)

Based on Table 6, the coefficient of determination indicates that the Trust variable (Z) has an R^2 value of 0.783, meaning that 78.3% of the variation in Trust is explained by Marketing Strategy (X1) and Artificial Intelligence (X2), while the rest is explained by other variables outside the model. Meanwhile, Operational Performance (Y) has an R^2 value of

0.922, indicating that 92.2% of its variation is explained by the variables in the research model. Overall, these results show that the structural model has a very strong explanatory power.

Tabel 7. *The Effect Size (f^2)*

Relationship Between Variables	f^2	Category
Strategic Marketing (X1) → Operational Performance (Y)	0,113	Small
Artificial Intelligence (X2) → Operational Performance (Y)	0,161	Moderate
Strategic Marketing (X1) → Trust (Z)	0,060	Small
Artificial Intelligence (X2) → Trust (Z)	0,330	Moderate
Trust (Z) → Operational Performance (Y)	0,614	Big

Source : Data Primary (2026)

Table 7 shows that Marketing Strategy (X1) has a small effect size f^2 on Trust (Z) and Operational Performance (Y). Artificial Intelligence (X2) exerts a medium effect on both Trust (Z) and Operational Performance (Y). Meanwhile, Trust (Z) demonstrates a large effect on Operational Performance (Y) with an f^2 value of 0.614. These results indicate that Trust contributes most strongly to enhancing operational performance, followed by the role of Artificial Intelligence in the research model.

Tabel 8. *Hypothesis Results (Path Coeficient)*

Hypothesis	Relationship	β (Original Sample)	T-Statistic	P-Value	Decision
H1	Strategic Marketing (X1) → Operational Performance (Y)	0.228	1.469	0.142	Rejected
H2	Artificial Intelligence (X2) →Operational Performance (Y)	0.305	1.456	0.146	Rejected
H3	Strategic Marketing (X1) → Trust (Z)	0.207	1.116	0.265	Rejected
H4	Artificial Intelligence (X2) → Trust (Z)	0.633	2.601	0.009	Accepted
H5	Trust (Z) → Operational Performance (Y)	0.469	2.854	0.004	Accepted

Source : Data Primary (2026)

Table 8 shows that Strategic Marketing (X1) has no significant effect on either Operationa Performance (Y) or Trust (Z), with p-values of 0.142 and 0.265, respectively. Artificial Intelligence (X2) also yields a non-significant effect on Operational Performance (Y) ($p = 0.146$). However, Artificial Intelligence (X2) significantly and positively affects Trust (Z) ($\beta = 0.633$); $p = 0.009$), and Trust (Z) significantly and positively affects Operational Performance (Y) ($\beta = 0.469$); $p = 0.004$). Consequently, only H4 and H5 are accepted, while H1, H2, and H3 are rejected.

Tabel 9. *Specific Indirect Effects*

Relationship	β (Original Sample)	T-Statistic	P-Value	Decision
Strategic Marketing (X1) → Trust (Z) → Operational Performance (Y)	0.127	0.867	0.386	Not Significant
Artificial Intelligence (X2) →Trust (Z) → Operational Performance (Y)	0.297	2.475	0.013	Significant

Source : Data Primary (2026)

Table 9 shows that Trust (Z) does not mediate the effect of Marketing Strategy (X1) on Operational Performance (Y) (p=0.386). Conversely, Trust (Z) significantly mediates the effect of Artificial Intelligence (X2) on Operational Performance (Y) (β = =0.297; T=2.475; p=0.013). This finding indicates that enhancing operational performance through Artificial Intelligence relies on increasing user trust in the systems and services used.

Discussion

The results indicate that Marketing Strategy has no significant effect on either Operational Performance or Trust. This finding implies that the implemented marketing strategies have not yet directly enhanced operational performance perceptions or built postgraduate students' trust. In higher education, user trust tends to stem from actual experiences with service quality rather than institutional marketing activities.

Conversely, Artificial Intelligence positively and significantly affects Trust, but has no direct effect on Operational Performance. This demonstrates that utilizing AI enhances user trust through faster, more accurate, and responsive services. This finding aligns with trust theories stating that system reliability and quality are critical factors in building user trust.

Furthermore, Trust has a positive and significant effect on Operational Performance. This means that higher user trust in the services and systems correlates with better perceived operational performance. Additionally, mediation analysis shows that Trust does not mediate the effect of Marketing Strategy on Operational Performance, but significantly mediates the effect of Artificial Intelligence on Operational Performance. This underscores that successful AI implementation to improve operational performance heavily depends on the institution's ability to build user trust. Consequently, Trust serves as the key linking factor between Artificial Intelligence utilization and enhanced Operational Performance among postgraduate students at Universitas Balikpapan.

CONCLUSSION AND RECOMMENDATION

This study shows that Artificial Intelligence positively and significantly affects Trust, while Trust positively and significantly affects Operational Performance. Conversely, Marketing Strategy has no significant effect on either Trust or Operational Performance; similarly, Artificial Intelligence has no direct effect on Operational Performance. The mediation analysis reveals that Trust significantly mediates the effect of Artificial Intelligence on Operational Performance, but fails to mediate the effect of Marketing Strategy on Operational Performance. This finding confirms that Trust is the key factor bridging Artificial Intelligence utilization to enhance Operational Performance among postgraduate students at Universitas Balikpapan.

The university needs to optimize the utilization of accurate, transparent, and user-friendly Artificial Intelligence to enhance user trust in academic services. Furthermore, improving digital service quality must become a priority, as it is proven to contribute more significantly to building trust than marketing activities alone.

This study is limited by the relatively small sample size and the use of a single institutional context. Future research is recommended to expand the sample scope and incorporate additional

variables that may influence trust and operational performance, such as digital literacy or organizational culture.

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