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# The Role of Digital Literacy in Mediating the Intention of Pontianak SMEs to Implement Artificial Intelligence as an Effort to Improve Marketing Performance

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A R T I C L E I N F O

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A B S T R A C T

This study investigates the relationship between artificial intelligence (AI) adoption intention, entrepreneurial orientation, and marketing performance among Small and Medium-sized Enterprises (SMEs) in Pontianak City, Indonesia, with digital literacy serving as a mediating variable. Data was collected through questionnaires from 153 SME owners and analyzed using Warp PLS methodology. The results demonstrate significant positive correlations between AI adoption intention and entrepreneurial orientation on both digital literacy and marketing performance. Notably, digital literacy emerged as a crucial mediating factor in these relationships. The findings underscore the vital role of digital literacy in enhancing SME marketing performance and suggest that policymakers should prioritize digital literacy initiatives to support SME development in the digital era. This research contributes to the understanding of how technological adoption and entrepreneurial characteristics interact with digital competencies to influence business performance in emerging markets.

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## INTRODUCTION

SMEs play a crucial role in the economic growth and development of a nation, including the Indonesian economy. They are considered a key support system for the national economy. In order to elevate SMEs, it is essential to implement strategies, one of which involves enhancing digital economic literacy (Erlanitasari et al., 2020).

The digital transformation accelerated by the COVID-19 pandemic has fundamentally reshaped both personal and business practices. While the pandemic caused widespread economic challenges, particularly affecting small and medium-sized businesses, it also catalyzed positive changes by forcing adaptation to digital technologies. This shift highlighted the critical connection between technological advancement and economic growth. Notably, the emergence of AI-enabled tools represents a significant breakthrough, filling an important void in current research capabilities. (Hruby, 2024).

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in Indonesia's economy, contributing 61.07% to the national GDP and absorbing 97% of the workforce. In Pontianak City, the MSME sector shows interesting dynamics with significant fluctuations in the number of business units over the past five years. Data shows changes from 28,706 units in 2019, increasing to 30,506 units in 2020, then experiencing a drastic decrease to 10,513 units in 2022, before recovering to 28,128 units in 2023. The geographical distribution of MSMEs in this city also varies, with Pontianak Kota and West Pontianak alternately leading in the number of business units. Although MSME growth in Pontianak is quite significant, they still face challenges in improving marketing performance, especially in the digital era. Artificial intelligence (AI) technology offers potential solutions to address these challenges, but its adoption among MSMEs is still limited, largely due to a lack of digital literacy.

In today's rapidly changing digital world, business owners need to understand how artificial intelligence can transform their operations by improving performance, streamlining processes, and driving new innovations..(Sixiao et al., n.d.). Recent technological breakthroughs in computing power, cloud infrastructure, and especially deep learning have propelled AI into the spotlight over the past ten years. This advancement has led to widespread adoption of AI technologies, from conversational AI and predictive analytics to autonomous vehicles. (Baez & Igbekele, n.d.).

This research aims to explore the role of digital literacy in mediating the intention of Pontianak City MSMEs to implement AI to improve marketing performance. The methodology used combines quantitative (survey) and qualitative (in-depth interviews and case studies) approaches to gain a comprehensive understanding of the factors influencing AI adoption and the role of digital literacy. The novelty of this research lies in the integration of the digital literacy concept as a mediating variable in the AI adoption process, focus on the local context of Pontianak City, and the use of mixed methodology. Additionally, this research also designs and tests concrete interventions through digital literacy training programs and AI implementation pilot projects. For companies in Saudi Arabia, particularly SMEs, implementing AI

solutions offers a pathway to overcome technological barriers and achieve lasting business success. This adoption not only helps individual businesses improve their performance but also contributes to the broader economic development of the Kingdom. (Badghish & Soomro, 2024a).

Small and medium enterprises should embrace digital marketing and e-commerce strategies to boost their financial outcomes and ensure long-term sustainability. Online marketing is particularly effective in influencing consumer buying decisions, especially among younger, tech-savvy generations. The impact of digital marketing on sales is significant and measurable - when properly implemented, it directly affects sales performance. Additionally, e-commerce provides crucial opportunities for small businesses to expand their operations and reach new markets. (Udayana et al., 2024).

Research has identified 27 distinct obstacles that small and medium enterprises face when trying to implement artificial intelligence. By understanding these challenges beforehand, SMEs can better plan their AI initiatives and anticipate potential problems. The most significant barriers fall into three main categories: knowledge gaps, financial constraints, and insufficient technical infrastructure - representing key social, economic, and technological hurdles that need to be addressed. (Oldemeyer et al., 2024).

This study is expected to contribute to the enrichment of literature related to technology adoption among MSMEs and provide practical insights for policymakers in designing effective digital literacy programs. Thus, this research not only fills gaps in academic literature but also provides practical tools to encourage effective AI adoption among MSMEs, particularly in developing areas like Pontianak City. The main objectives of this research are to analyze factors influencing AI adoption among MSMEs in Pontianak City, evaluate the mediating role of digital literacy in this adoption process, and design effective intervention strategies to improve AI adoption and marketing performance of MSMEs.

## LITERATURE REVIEW

A study by Li et al. (2018) reveals that AI adoption can enhance operational efficiency and competitiveness of SMEs. However, the level of AI adoption among SMEs remains relatively low compared to large companies, primarily due to resource limitations and a lack of understanding about AI benefits (Chen et al., 2022)

Alhumaid et al., (2023) identify factors influencing AI adoption intention among SMEs, including perceived benefits, ease of use, and organizational technological readiness. Government support and competitive pressure also play crucial roles in encouraging SMEs to adopt AI (Badghish & Soomro, 2024b). Lyon et al., (2000) define entrepreneurial orientation as a company's tendency to innovate, take risks, and be proactive in facing market opportunities. Their research shows that SMEs with strong entrepreneurial orientation tend to perform better in terms of sales growth and profitability.

Huang et al., (2023) confirm a positive relationship between entrepreneurial orientation and SME performance across various cultural and

economic contexts. They find that the dimensions of innovation and proactivity have the most significant impact on SME performance.

Furthermore, research by Krajčík et al., (2023) shows that digital literacy acts as an important mediator between technology adoption and SME business performance. Raharjo et al., (2024) reveal that SMEs with higher levels of digital literacy tend to be more ready to adopt new technologies, including AI, and are better able to utilize them to improve marketing performance. Research conducted by Garcia-Morales et al., (2018) finds that SMEs that successfully integrate digital technology into their marketing strategies show significant improvements in customer reach, cost efficiency, and sales conversion rates. Laila et al., (2024) identify several key performance indicators for digital marketing in SMEs, including increased website traffic, social media engagement, and customer retention rates.

In the Indonesian context, Hendrawan et al., (2024) reveal that although there is increased awareness of the importance of digitalization, many SMEs still face barriers such as limited infrastructure and lack of digital skills. However, Purwanti et al., (2022) show that there are great opportunities for Indonesian SMEs that successfully adopt digital technology, with higher sales growth rates for those active on e-commerce platforms and social media.

H1: Intention to Use AI positively influences Digital Literacy.
H2: Digital Literacy positively influences Marketing Performance.
H3: Intention to Use AI has a direct positive effect on Marketing Performance.

**Entrepreneurial Orientation Theory**

Entrepreneurial Orientation (EO) refers to the processes, practices, and decision-making activities that lead to new entry or innovative behaviors in organizations. This theory, originally proposed by Miller (1983) and further developed by Lumpkin and Dess (1996), suggests that firms with higher levels of EO tend to be more innovative, proactive, and risk-taking.

In the context of this model, Entrepreneurial Orientation appears to influence both Digital Literacy and Marketing Performance, suggesting that more entrepreneurially oriented individuals or firms are more likely to develop digital literacy skills and achieve better marketing performance.

Previous research by Wiklund and Shepherd (2003) has shown positive relationships between EO and firm performance. In the digital context, studies like Eggers et al. (2017) have explored the role of EO in digital transformation and marketing performance.

H4: Entrepreneurial Orientation positively influences Digital Literacy.
H5: Entrepreneurial Orientation positively influences Marketing Performance.

These hypotheses and explanations are based on the relationships depicted in the image and common theories in technology adoption and entrepreneurship research. To fully develop this model, you would need to conduct a comprehensive literature review and potentially refine the hypotheses based on the specific context of your research.

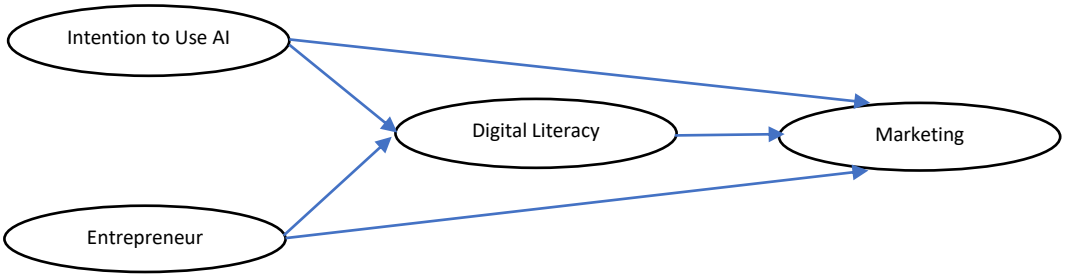


Figure 1. Conceptual Framework

## METHODOLOGY

### A. Population and Sample

This research is a quantitative study with a population of MSMEs in Pontianak City. The sample size is determined based on the Structural Equation Model (SEM) analysis method, where a minimum of 5 times the number of indicator variables (7) is required. With 11 indicators, the minimum sample size is 60. In this study, the sample examined consists of 153 respondents obtained from questionnaires distributed randomly using purposive sampling technique, where respondents meet predetermined criteria.

### B. Data Collection Technique

Data for this research was collected through a comprehensive approach utilizing multiple methods. An extensive literature review was conducted, encompassing academic publications, industry reports, and government documents, to establish a solid theoretical foundation and identify relevant variables. Researchers also carried out field observations of MSMEs in Pontianak City, providing firsthand insights into their operations, challenges, and current technology usage. To gather qualitative data on perspectives, experiences, and attitudes towards AI adoption and digital literacy, in-depth interviews were conducted with MSME owners, managers, and key stakeholders. Additionally, a structured questionnaire was developed and distributed to MSME respondents in Pontianak City. This questionnaire employed a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to measure various constructs related to AI adoption, digital literacy, and marketing performance. This multi-faceted approach to data collection allowed for triangulation, enhancing the validity and reliability of the research findings, while the questionnaire provided quantitative data for statistical analysis of the research hypotheses and examination of relationships between variables.

### C. Data Analysis Method

Data analysis was conducted using path analysis with the Structural Equation Modelling (SEM) model through the WARP PLS 7.0 program (8).

**D. Measurement Model**

The study used confirmatory factor analysis to assess the measurement model's reliability and validity. Specifically, the evaluation focused on how well indicators represented their underlying constructs. The validation process involved both convergent and discriminant validity tests, employing the Multi Trait-Multi Method methodology.

**E. Hypothesis Testing**

Hypothesis testing was conducted through path analysis on the constructed model to analyse the direction of relationships between independent and dependent variables (10). The strength of relationships between constructs was measured by examining the path coefficients and their significance levels, which were then compared with the research hypotheses. The significance level used was 5%. As Kelly stated, the 5% significance level is a widely accepted threshold in statistical analysis, often associated with the work of Sir Ronald Fisher in the early 20th century (11). Decision-making criteria:

- If p-value ≥ 0.05, then H0 is accepted.
- If p-value < 0.05, then H0 is rejected and Ha is accepted.

## RESULTS AND DISCUSSION

**1. Measurement Model Testing (Outer Model)**

Before testing any causal relationships or predictions in a research model, it's essential to first validate the measurement model's quality. This preliminary step, known as the purification stage, involves evaluating the outer model to confirm both the reliability of research instruments and the validity of the constructs.

Table 1. Convergent Validity Testing based on Loading Factor

| **Variabel** | **Item Pernyataan** | **Nilai Loading Factor** | **Status** |
|---|---|---|---|
| *Intention to Use AI* | X1.1 | (0.954) | Valid |
| | X1.2 | (0.793) | Valid |
| | X1.3 | (0.899) | Valid |
| | X1.4 | (0.861) | Valid |
| *Entrepreneur Orientation* | X2.1 | (0.807) | Valid |
| | X2.2 | (0.797) | Valid |
| | X2.3 | (0.802) | Valid |
| | X2.4 | (0.786) | Valid |

| | | | |
|---|---|---|---|
| *Digital Literacy* | Z.1 | (0.744) | Valid |
| | Z.2 | (0.784) | Valid |
| | Z.3 | (0.823) | Valid |
| | Z.4 | (0.777) | Valid |
| *Marketing Performance* | Y.1 | (0.755) | Valid |
| | Y.2 | (0.975) | Valid |
| | Y.3 | (0.968) | Valid |
| | Y.4 | (0.908) | Valid |

Source: Processed Data with Warp PLS 8.0 (2024)

Based on the convergent validity testing using the loading factor approach on the given data, the following results were obtained:

1. There are 4 indicators for the latent variable Intention to Use AI, namely X1.1; X1.2; X1.3; X1.4. All loading values are known to be >0.7.
2. There are 4 indicators for the latent variable Entrepreneur Orientation, namely X2.1; X2.2; X2.3; X2.4. All loading values are known to be >0.7.
3. There are 4 indicators for the latent variable Digital Literacy, namely Z.1; Z.2; Z.3; Z.4. All loading values are known to be >0.7.
4. There are 4 indicators for the latent variable Marketing Performance, namely Y.1; Y.2; Y.3; Y.4. All loading values are known to be >0.7.

Based on these results, it can be concluded that all indicators for each latent variable have loading factor values above 0.7, indicating good convergent validity for all constructs.

Next, to complete the convergent validity analysis, testing based on the Average Variance Extracted (AVE) value is required.

Table 2. Value of Average Variance Extracted (AVE)

| No | Variabel Laten | AVE | Status |
|---|---|---|---|
| 1 | *Intention to Use AI* | 0.676 | Valid |
| 2 | *Entrepreneur Orientation* | 0.542 | Valid |
| 3 | *Digital Literacy* | 0.613 | Valid |
| 4 | *Marketing Performance* | 0.730 | Valid |

Source: Processed Data with Warp PLS 8.0 (2024)

Next, convergent validity testing based on the Average Variance Extracted (AVE) value was conducted. Based on the results of the convergent validity test using AVE values, it is known that:

1. The AVE value for Intention to Use AI is 0.676
2. The AVE value for Entrepreneur Orientation is 0.542
3. The AVE value for Digital Literacy is 0.613
4. The AVE value for Marketing Performance is 0.730

According to Mahfud and Ratmono in (Latupapua et al., 2021), The analysis shows that all Average Variance Extracted (AVE) values exceeded the minimum threshold of 0.5, successfully meeting the established criteria for convergent validity.

In conclusion, based on both criteria (loading factor and AVE), all latent variables in this model demonstrate good convergent validity. All indicators have loading factors above 0.7, and all constructs have AVE values above 0.5, indicating that the latent variables can explain more than 50% of the variance of their indicators.

**1. Discriminant Validity Test**

For the discriminant validity test, it appears that the loading value for each indicator variable is greater for its latent variable compared to other latent variables. Chin, Gopal, and Sainsbury in Abdillah and Jogiyanto (2015) state that a model has sufficient discriminant validity if the square root of AVE for each construct is greater than the correlation between other constructs in the model (Latupapua et al., 2021).

Table 3. AVE Root Value and Correlation of Latent Variables

| | *Intention to Use AI* | *Entrepreneur Orientation* | *Digital Literacy* | *Marketing Performance* |
|---|---|---|---|---|
| *Intention to Use AI* | (0.822) | 0.577 | 0.922 | 0.566 |
| *Entrepreneur Orientation* | 0.577 | (0.736) | 0.701 | 0.639 |
| *Digital Literacy* | 0.922 | 0.701 | (0.783) | 0.727 |
| *Marketing Performance* | 0.566 | 0.639 | 0.727 | (0.854) |

Source: Processed Data with Warp PLS 8.0 (2024)

Based on Table 3 showing the square root of AVE values and latent variable correlations above, all variables are declared valid because the square root of AVE values > latent variable correlations.

**2. Reliability Test**

The reliability test is used to measure consistency and stability in research. A construct is said to be reliable if it meets the rule of thumb where the values of Cronbach's alpha and composite reliability must be greater than 0.7, although a value of 0.6 is still acceptable, as stated by Adillah and Jogiyanto in (Latupapua et al., 2021).

Table 4. Cronchbach's Alpha and Composite Reliability

| **Variabel Laten** | ***Cronchbach's Alpha*** | ***Composite Reliability*** | **Status** |
|---|---|---|---|
| Intention to Use AI | 0.823 | 0.888 | Reliabel |

| | | | |
|---|---|---|---|
| Entrepreneur Orientation | 0.705 | 0.820 | Reliabel |
| *Digital Literacy* | 0.789 | 0.820 | Reliabel |
| *Marketing Performance* | 0.855 | 0.910 | Reliabel |

Source: Processed Data with Warp PLS 8.0 (2024)

Table 4 shows that all Cronbach's Alpha values are > 0.7, as seen from the latent variables Social Media Marketing, Digital Payment, Purchase Interest, and Purchase Decision, each having Cronbach's alpha values of 0.813, 0.813, 0.779, and 0.797 respectively. According to Mahfud and Ratmono in (Latupapua et al., 2021), the suggested CR value is above 0.7. It is known that all CR values are > 0.7, which means they have met the reliability requirements based on CR.

After evaluating the measurement model where convergent validity, discriminant validity, and composite reliability have met the requirements, the next stage is to evaluate the structural model. According to Wijoyo in (Latupapua et al., 2021), testing the structural model or inner model tests the hypotheses between one latent variable and another.

**1. $R^2$ Value**

In this study, the $R^2$ of the Digital Literacy variable is 0.901, which means that the Digital Literacy variable can be explained by the independent variables in the model by 90.1%, while the remaining 9.9% is explained by other variables outside the research model. For the Marketing Performance variable, an $R^2$ value of 0.867 was obtained, which means that the Marketing Performance variable can be explained by the independent variables in the model by 86.7%, while the remaining 13.3% is explained by other variables outside the research model. Both of these $R^2$ values indicate that the model has excellent predictive capability, with more than 85% of the variation in both dependent variables being explained by the independent variables in the model.

Table 5. R-squared

| | Digital Literacy | Marketing Performance |
|---|---|---|
| **R-*squared*** | 0.901 | 0.867 |

Source: Processed Data with Warp PLS 8.0 (2024)

**2. Model Fit Testing**

The model fit test is used to determine whether a model has a good fit with the data or not. The following are the model fit results for this research as shown in

Table 6. Fit Models and Quality Indices

| **Index** | **Nilai** | **Keterangan** |
|---|---|---|
| *Average path coefficient* (APC) | 0.454, P<0.001 | Terima |
| *Average* R-*squared* (ARS) | 0.884, P<0.001 | Terima |
| *Average adjusted* R-*squared* (AARS) | 0.882, P<0.001 | Terima |
| *Average block* VIF (AVIF) | 3.350, acceptable if <= 5, ideally <= 3.3 | Terima |
| *Average full collinearity* VIF (AFVIF) | 6.503, acceptable if <= 5, ideally <= 3.3 | Terima |
| Tenenhaus GoF (GoF) | 0.752, small >= 0.1, medium >= 0.25, large >= 0.36 | Terima |

| | | |
|---|---|---|
| Sympson's *paradox ratio* (SPR) | 1.000, acceptable if >= 0.7, ideally = 1 | Terima |
| R-*squared contribution ratio* (RSCR) | 1.000, acceptable if >= 0.9, ideally = 1 | Terima |
| *Statistical suppression ratio* (SSR) | 1.000, acceptable if >= 0.7 | Terima |
| *Nonlinear bivariate causality direction ratio* (NLBCDR) | 1.000, acceptable if >= 0.7 | Terima |

Source: Processed Data with Warp PLS 8.0 (2024)

From the general result output in Table 6, it is known that the proposed model has achieved a good fit and complies with the rule of thumb for model fit testing, thus allowing us to proceed with the next phase of testing.

### 3. Hypothesis Testing

The relationships between latent variables in this research model can be observed from the estimated path coefficients and their significance levels (p-value). The following is an image of the test results using Warp PLS 8.0:

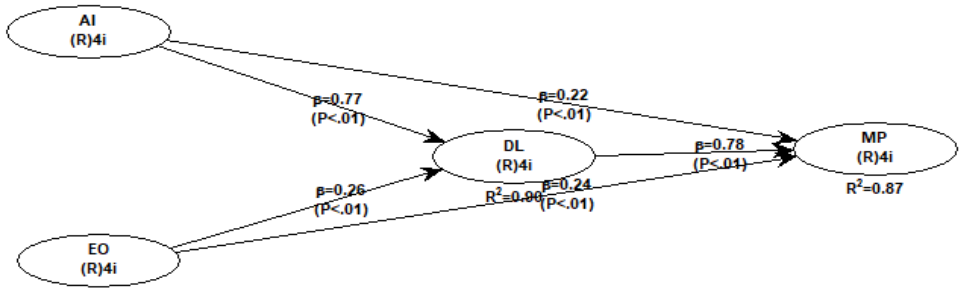


Figure 2. Research Model Testing with Warp PLS 8.0

We can evaluate our research hypotheses by analysing the p-values obtained from our statistical tests. A p-value below the conventional threshold of 0.05 leads us to reject the null hypothesis (H0), suggesting the presence of a statistically significant relationship. The path analysis diagram presented below illustrates the strength and directionality of relationships between variables through their calculated path coefficients.

Table 7. Estimation Results Path Coefficients

| **Variable** | ***Path Coefficients*** | ***Standard Errors*** | **P *value*** | **Status** |
|---|---|---|---|---|
| AI → MP | 0.216 | 0.077 | <0.001 | Significant |
| AI→DL | 0.773 | 0.068 | <0.001 | Significant |
| EO→MP | 0.242 | 0.077 | <0.001 | Significant |
| EO→DL | 0.265 | 0.077 | <0.001 | Significant |
| DL→MP | 0.775 | 0.068 | <0.001 | Significant |

Source: Processed Data with Warp PLS 8.0 (2024)

Based on the p-values shown in Table 7, the results of hypothesis test 1 are as follows:

1. The variable intention to adopt AI (Artificial Intelligence) has a direct effect on DL (Digital Literacy) with a path coefficient of 0.77 ($p<0.01$), indicating a strong and significant positive relationship.
2. The intention to adopt AI (Artificial Intelligence) also has a direct effect on MP (Marketing Performance) with a path coefficient of 0.22 ($p<0.01$), indicating a weak but significant positive relationship.
3. The EO (Entrepreneur Orientation) variable has a direct effect on Digital Literacy (DL) with a path coefficient of 0.26 ($p<0.01$), indicating a moderate and significant positive relationship.
4. EO also has a direct effect on MP with a path coefficient of 0.24 ($p<0.01$), indicating a moderate and significant positive relationship.
5. DL has a direct effect on MP with a path coefficient of 0.78 ($p<0.01$), indicating a strong and significant positive relationship.
6. The $R^2$ value for the DL variable is 0.90, which means 90% of the variation in DL can be explained by AI and EO.
7. The $R^2$ value for the MP variable is 0.87, which means 87% of the variation in MP can be explained by AI, EO, and DL.

In conclusion, this model shows that AI and EO have both direct and indirect effects (through DL) on MP. DL mediates the relationship between AI and EO towards MP. All relationships in this model are significant at the $p<0.01$ level.

Based on the given figure, the following is an explanation of the hypothesis testing:

1. Hypothesis Test 1

H0: The intention to adopt AI (Artificial Intelligence) does not positively and significantly affect Digital Literacy (DL).
Ha: The intention to adopt AI (Artificial Intelligence) positively and significantly affects Digital Literacy (DL).
H0: Entrepreneur Orientation (EO) does not positively and significantly affect Digital Literacy (DL).
Ha: Entrepreneur Orientation (EO) positively and significantly affects Digital Literacy (DL).

a. Decision-Making Basis:

P-value ≤ 0.01 (α = 1%), H0 is rejected, Ha is accepted
P-value > 0.01 (α = 1%), H0 is accepted, Ha is rejected

b. Decision:

P-value = <0.01 < 0.01, therefore Ha is accepted, and H0 is rejected for both relationships

c. Explanation:

The intention to adopt AI (Artificial Intelligence) and Entrepreneur Orientation (EO) have a significant positive effect on Digital Literacy (DL), as seen in the p-value which is <0.01. This means that the higher the use of AI and

the stronger the Entrepreneur Orientation, the higher the Digital Literacy will be, and vice versa, with a confidence level of 99% (1% error).

The path coefficients show that the intention to adopt AI (Artificial Intelligence) has a stronger influence (β=0.77) compared to EO (β=0.26) on DL. Together, these two independent variables explain 90% of the variation in DL ($R^2$=0.90).

**2. Hypothesis Testing with Mediation Effects**

According to Baron and Kenny (1996); Hair, et al. (2011); and Kock (2013), hypothesis testing with mediation effects is carried out in two steps: direct effect and indirect effect (Latupapua et al., 2021). In this study, the researchers estimated the indirect effect by adding a mediating variable between the independent and dependent variables. In this research, the researchers estimated the indirect effect, which is the influence of Digital Payment Method Availability and Social Media Marketing on Purchase Decision with Purchase Interest as a mediating variable. The figure can be seen in Figure 4.2 and Table 4.20 as:

Table 8. Estimation Result of Indirect Effect

| Variable | *Path Coefficients* | *Standard Errors* | P *value* | Status |
|---|---|---|---|---|
| **AI →MP** | 0.599 | 0.050 | <0.001 | Significant |
| **EO→MP** | 0.205 | 0.055 | <0.001 | Significant |

Source: Processed Data with Warp PLS 8.0 (2024)

Based on the p-values shown in **Table 8**, the results of hypothesis test 2 are as follows:

**Hypothesis Test 2**

H0: Digital Literacy (DL) cannot mediate the effect of the intention to adopt AI (Artificial Intelligence) on Marketing Performance (MP).

Ha: Digital Literacy (DL) can mediate the effect of the intention to adopt AI (Artificial Intelligence) on Marketing Performance (MP).

H0: Digital Literacy (DL) cannot mediate the effect of Entrepreneur Orientation (EO) on Marketing Performance (MP).

Ha: Digital Literacy (DL) can mediate the effect of Entrepreneur Orientation (EO) on Marketing Performance (MP).

**a. Decision-Making Basis:**

P-value ≤ 0.01 (α = 1%), H0 is rejected, Ha is accepted

P-value > 0.01 (α = 1%), H0 is accepted, Ha is rejected

**b. Decision:**

P-value = <0.01 < 0.01, therefore Ha is accepted, and H0 is rejected for both mediation relationships

**c. Explanation:**

Digital Literacy (DL) can significantly mediate the effect of the intention to adopt AI (AI) and Entrepreneur Orientation (EO) on Marketing Performance

(MP). This means that the higher the Digital Literacy, the stronger the influence of AI and EO on Marketing Performance.

This is indicated by significant path coefficients from AI to DL (β=0.77, p<0.01), EO to DL (β=0.26, p<0.01), and DL to MP (β=0.78, p<0.01). Additionally, there are also significant direct effects from AI to MP (β=0.22, p<0.01) and EO to MP (β=0.24, p<0.01).

This model explains 87% of the variation in Marketing Performance ($R^2$=0.87), showing that the combination of direct and indirect effects (through DL) of AI and EO contributes substantially to Marketing Performance, with a 99% confidence level (1% error).

**Relationship between the Effect of Intention to Use AI (X1) on Marketing Performance (Y)**

Based on the results of data analysis in this study, it can be determined that the Intention to Use AI positively and significantly influences Marketing Performance, which means that if the Intention to Use AI is higher, the Marketing Performance of MSMEs is also higher. This is indicated by the positive and significant path coefficient value at the p<0.01 level. This finding indicates that the higher the intention of MSME actors to adopt and use AI technology, the better marketing performance they can achieve.

**The relationship between the effect of entrepreneurial orientation (X2) on Marketing Performance (Y)**

Based on the results of data analysis in this study, it can be determined that Entrepreneurial Orientation positively and significantly influences Marketing Performance, which means that if the Entrepreneurial Orientation is higher, the Marketing Performance of MSMEs is also higher. This is indicated by the positive and significant path coefficient value at the p<0.01 level. This finding shows that MSME actors with a strong entrepreneurial orientation tend to achieve better marketing performance.

**The Relationship between AI Intention to Use (X1) and Entrepreneurial Orientation (X2) to Marketing Performance (Y) through Digital Literacy (M) as a Mediating Variable**

Digital Literacy can significantly mediate the influence of the Intention to Use AI and Entrepreneurial Orientation on the Marketing Performance of MSMEs. This means that the higher the level of Digital Literacy, the stronger the influence of the Intention to Use AI and Entrepreneurial Orientation on Marketing Performance. This is indicated by significant path coefficient values from X1 to M, X2 to M, and M to Y, with a significance level of p<0.01. This finding indicates that Digital Literacy plays an important role in strengthening the relationship between the intention to use AI and entrepreneurial orientation with the marketing performance of MSMEs.

In this study, we explored the intricate relationships between the intention to use AI, entrepreneurial orientation, digital literacy, and marketing performance among SMEs in Pontianak City. Our findings reveal significant

positive effects of both AI adoption intention and entrepreneurial orientation on digital literacy and marketing performance, with digital literacy playing a crucial mediating role. These results align with and extend previous research in technology adoption and entrepreneurship, such as the Technology Acceptance Model (Davis, 1989) and Entrepreneurial Orientation theory (Lumpkin and Dess, 1996). The strong mediating effect of digital literacy ($\beta=0.78$, $p<0.01$) underscores its importance in translating technological intentions and entrepreneurial mindsets into tangible marketing outcomes. This suggests that enhancing digital literacy among SME owners and managers could be a key strategy for improving the effectiveness of AI adoption and entrepreneurial initiatives. The study's context in Pontianak City provides valuable insights into technology adoption patterns in developing regions, contributing to the broader understanding of digital transformation in emerging markets. These findings have important implications for policymakers and SME support programs, highlighting the need for targeted digital literacy interventions to maximize the benefits of AI adoption and entrepreneurial efforts in enhancing marketing performance.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings, we can conclude that both the intention to use AI and entrepreneurial orientation significantly influence marketing performance among SMEs in Pontianak City, with digital literacy playing a crucial mediating role. The strong positive relationships observed highlight the importance of fostering a tech-savvy entrepreneurial mindset in today's digital business landscape. To implement these findings, we recommend that local policymakers and business support organizations prioritize digital literacy programs tailored specifically for SME owners and managers. These programs should focus on practical AI applications in marketing and business operations, while also nurturing entrepreneurial skills. Additionally, creating a supportive ecosystem that encourages AI adoption and innovation could further enhance SMEs' marketing performance. Future research could explore the long-term impacts of AI adoption on SME growth and investigate potential barriers to digital literacy improvement in similar developing urban contexts.

## FURTHER STUDY

Future research should expand the sample size and geographic scope beyond Pontianak City to enhance generalizability. Longitudinal studies could track the long-term effects of AI adoption and digital literacy improvements on SME performance. Investigating sector-specific impacts of AI and digital literacy could provide more nuanced insights. Qualitative research exploring barriers to AI adoption and digital literacy enhancement among SMEs would complement this quantitative study. Additionally, examining the role of external factors such as government policies and technological infrastructure in facilitating AI adoption and digital transformation among SMEs could offer valuable policy implications.

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