

Artificial Intelligence Adoption and Entrepreneurial Performance: Digital Capability as a Conversion Mechanism

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ABSTRACT

This study examines how artificial intelligence adoption translates into entrepreneurial performance through digital capability and whether entrepreneurial orientation strengthens this pathway. Survey data from 300 Indonesian entrepreneurs and business managers using digital technologies were analyzed using PLS-SEM in SmartPLS 4. Artificial intelligence adoption positively affected entrepreneurial performance and digital capability, while digital capability improved performance and significantly mediated the adoption-performance relationship. Entrepreneurial orientation did not significantly moderate either the digital capability-performance relationship or the indirect effect. The findings show that artificial intelligence creates business value primarily when entrepreneurs possess capabilities to integrate digital tools, data, and processes. The study offers applied implications for entrepreneurship development, SME digitalization, and capability-building programs in emerging economies.

INTRODUCTION

Artificial intelligence (AI) has moved from an experimental technology to an increasingly practical business resource for entrepreneurs and small and medium-sized enterprises (SMEs). Its applications now include customer analytics, automated service, demand prediction, content generation, pricing support, fraud screening, workflow automation, and decision assistance. For entrepreneurs operating with limited managerial slack, these applications can reduce information-processing costs and accelerate decisions. Yet technology acquisition does not automatically generate superior performance. The value of AI depends on whether a business can integrate data, people, routines, and digital infrastructure into repeatable operating capabilities. Recent research therefore increasingly treats AI adoption as an organizational transformation problem rather than a simple technology-purchase decision (Arroyabe et al., 2024; Badghish & Soomro, 2024; Climent et al., 2024; Jalil et al., 2025; Oldemeyer et al., 2025).

This distinction is especially important in entrepreneurship. Digital entrepreneurs frequently adopt tools faster than they formalize the complementary capabilities required to use them consistently. An enterprise may subscribe to an AI service yet still lack data discipline, interoperable workflows, staff digital literacy, or managerial routines for translating analytical output into action. Studies of digital transformation and SME performance similarly show that digital capability, dynamic capability, organizational agility, and technology absorptive capacity shape the performance consequences of digital investment (Abourobkbah et al., 2023; Davies et al., 2023; Ferreira et al., 2024; Heredia et al., 2022; Karadağ et al., 2024; Kim & Jin, 2024; Trieu et al., 2023). This suggests that the key issue is not simply whether entrepreneurs adopt AI, but how adoption becomes an operational capability that supports measurable business outcomes.

A second issue concerns entrepreneurial orientation (EO), usually reflected in innovativeness, proactiveness, and willingness to take calculated risks. EO is often expected to strengthen the value of new technologies because proactive and innovative firms are more willing to experiment, redesign processes, and exploit emerging opportunities. However, recent evidence is mixed. EO can improve innovation and performance, yet its contribution may depend on the presence of complementary capabilities, environmental conditions, and resource availability (Al-Momani et al., 2023; Arabeche et al., 2022; Asad et al., 2023; Dayan et al., 2023; Huang et al., 2023; Kukanja, 2024; Saleh & Athari, 2023; Santos-Vijande et al., 2022). This makes EO a plausible but not guaranteed boundary condition in AI-enabled entrepreneurship.

The Indonesian context offers a useful setting for examining these relationships. SMEs and entrepreneurial ventures are increasingly exposed to digital platforms, AI-enabled tools, and data-driven business models, while capability gaps remain uneven. The present study focuses on entrepreneurs and business managers who use digital technology and participate in business decision-making. It contributes to applied entrepreneurship and technology research by integrating AI adoption, digital capability, entrepreneurial orientation, and entrepreneurial performance in one moderated mediation

model. Specifically, the study asks whether AI adoption improves entrepreneurial performance directly and through digital capability, and whether EO strengthens the digital capability-performance path and the indirect AI-performance relationship. The results provide evidence on the mechanism through which AI adoption is converted into business value and identify a practical priority for entrepreneurship support programs: capability development rather than technology access alone.

LITERATURE REVIEW

Artificial Intelligence Adoption and Entrepreneurial Performance

AI adoption refers to the purposeful integration of intelligent technologies into business processes, decision routines, and customer-facing activities. In SMEs, adoption is increasingly associated with automation, data-driven decisions, new service configurations, and more responsive business models. Recent studies report positive links between AI-related capabilities and firm outcomes, although performance gains depend on organizational readiness and the context of implementation (Abrokwah-Larbi & Awuku-Larbi, 2024; Al Dhaheri et al., 2024; Alsharah, 2025; Badghish & Soomro, 2024; Chen & Tajdini, 2025; Climent et al., 2024; Fosso Wamba et al., 2024; Gazi et al., 2024; ul Haq et al., 2025). AI can strengthen entrepreneurial performance by improving the speed and quality of decisions, supporting innovation, reducing repetitive work, and enabling more precise resource allocation (Oduro et al., 2023). These mechanisms are particularly valuable to smaller ventures that face resource constraints and volatile demand. Accordingly, this study proposes that AI adoption is positively associated with entrepreneurial performance (Jedličková, 2025).

H1: Artificial Intelligence Adoption has a positive and significant effect on Entrepreneurial Performance.

Digital Capability as a Conversion Mechanism

Digital capability reflects the organizational ability to mobilize digital knowledge, infrastructure, and process integration to create business value. It differs from owning digital assets because it emphasizes what the organization can repeatedly do with those assets. Digital literacy, infrastructure agility, and integration of digital processes are therefore central dimensions. Studies across SMEs show that digital capability supports performance, resilience, innovation, and successful digital transformation (Abdelwaheed et al., 2026; Atobishi et al., 2024; Davies et al., 2023; Ferreira et al., 2024; Hautala-Kankaanpää, 2022; Heredia et al., 2022; Karadağ et al., 2024; Kim & Jin, 2024; Prakasa & Jumani, 2024; Proksch et al., 2024; Rupeika-Apoga et al., 2022; Samsuden et al., 2024; Wang et al., 2022; Yu et al., 2022; Zhang et al., 2025). From this perspective, AI adoption should stimulate digital capability because using AI requires firms to improve data handling, digital skills, and workflow integration. Digital capability should in turn enhance entrepreneurial performance. More importantly, capability should mediate the AI-performance link by converting technology into operational and strategic value.

H2: Artificial Intelligence Adoption has a positive and significant effect on Digital Capability.

H3: Digital Capability has a positive and significant effect on Entrepreneurial Performance.

H4: Digital Capability mediates the relationship between Artificial Intelligence Adoption and Entrepreneurial Performance.

Entrepreneurial Orientation as a Boundary Condition

Entrepreneurial orientation captures a strategic posture oriented toward innovation, proactive opportunity pursuit, and risk taking. Research shows that EO can improve firm outcomes directly and can also shape how firms deploy knowledge, technology, and market capabilities (Al-Momani et al., 2023; Arabeche et al., 2022; Asad et al., 2023; Dayan et al., 2023; Huang et al., 2023; Jang & Lee, 2025; Kukanja, 2024; Labella-Fernández et al., 2026; Liu & Wang, 2024; Saleh & Athari, 2023; Satar et al., 2024; Santos-Vijande et al., 2022; Wu & Yu, 2024; Xiao et al., 2025; Zhang et al., 2024). In principle, firms with stronger EO should exploit digital capability more aggressively and should be more willing to redesign business models around AI-generated insights. Yet this moderating role may weaken when technical capability itself is the dominant constraint. The present study therefore tests EO as a contingency variable rather than assuming that a more entrepreneurial posture always amplifies technology-related gains.

H5: Entrepreneurial Orientation positively moderates the relationship between Digital Capability and Entrepreneurial Performance.

H6: Entrepreneurial Orientation positively moderates the indirect effect of Artificial Intelligence Adoption on Entrepreneurial Performance through Digital Capability.

Applied Technology and Sustainable Entrepreneurship Implications

The applied relevance of the model extends beyond short-term productivity. Digital capabilities can support more resource-efficient processes, faster learning, and improved organizational resilience, which are increasingly associated with sustainable entrepreneurship and long-term SME competitiveness. Recent studies connect digitalization, AI capability, entrepreneurial orientation, green innovation, and sustainable performance in several contexts (Abdelfattah et al., 2025; Ashkani et al., 2026; Dahri et al., 2025; Gao et al., 2025; Kurniasari et al., 2023; Mrad & Belgaroui, 2025; Qader et al., 2022; Ragmoun & Aloulou, 2026; Sánchez-Rodríguez et al., 2025; Xu et al., 2022). The present study does not measure environmental outcomes directly; rather, it identifies the capability mechanism through which AI adoption can become a more durable entrepreneurial resource. This distinction is important because sustainable technology use depends on organizational capacity to absorb, integrate, and govern the technology over time.

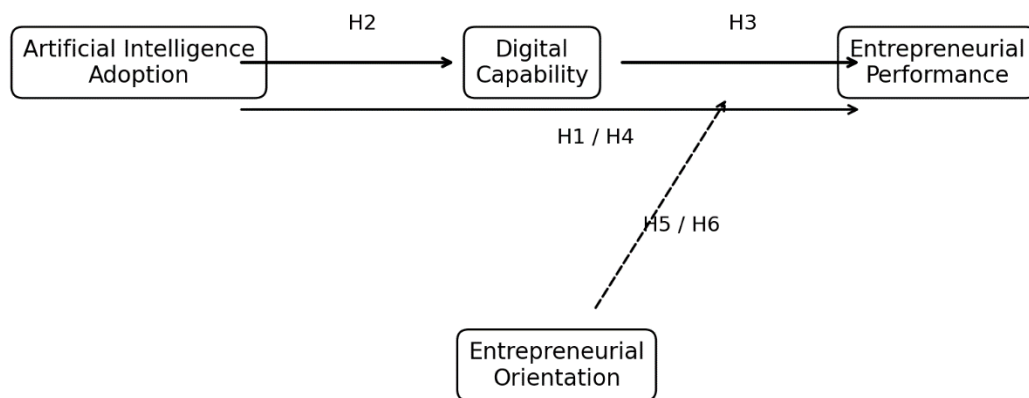


Figure 1. Conceptual Framework

METHODOLOGY

This study used a quantitative explanatory design based on survey data from 300 Indonesian entrepreneurs and business managers. Respondents were selected purposively using three inclusion criteria: they were entrepreneurs or business managers, they used digital technology in business operations, and they participated in business decision-making. The research data were collected through an online questionnaire. The shared dataset used for this manuscript is deidentified; direct identifiers were removed before analysis and public sharing.

The model contains four constructs. Artificial Intelligence Adoption is the exogenous construct and is represented by AI integration, data-driven decision support, and operational automation. Digital Capability is the mediator and is represented by digital literacy, IT infrastructure agility, and digital business process integration. Entrepreneurial Orientation is the moderator and is represented by innovativeness, proactiveness, and risk-taking. Entrepreneurial Performance is the outcome construct and is represented by financial growth, operational efficiency, and innovation performance. Questionnaire items used a five-point Likert response format from strongly disagree (1) to strongly agree (5).

Data analysis used Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. The constructs were treated as multidimensional composites, so the measurement assessment emphasized dimension weights and multicollinearity. Variance Inflation Factor (VIF) values below 3.3 were used as a conservative indication that critical collinearity was absent. The structural assessment focused on path coefficients, bootstrap standard deviations, t-statistics, p-values, mediation, moderation, and moderated mediation. The reported model outputs used in this article are preserved in the accompanying supplementary evidence workbook. The raw deidentified item-level dataset is also supplied so that readers can inspect the response data and reproduce descriptive analyses. Exact reproduction of the original SmartPLS bootstrap requires the original SmartPLS project and algorithm settings; therefore, this manuscript reports only the model statistics that are documented in the preserved analysis evidence and does not invent unavailable R-squared, f-squared, Q-squared, or PLSpredict values.

The sample included 174 men (58.0 percent) and 126 women (42.0 percent). To reduce disclosure risk, the public data package excludes religion,

ethnicity, and other unnecessary demographic fields. The research package contains the analysis dataset, a data dictionary, aggregate sample profile, the reported measurement model, the reported structural model, and derived effect summaries.

RESEARCH RESULT

The empirical results are presented in four stages: the sample profile, composite measurement model assessment, direct and indirect hypothesis testing, and interpretation of the effect structure. Tables summarize the statistical evidence rather than reproducing raw software output.

Table 1. Aggregate Sample Profile

Gender	n	Percent (%)
Male	174	58.00
Female	126	42.00

Source: Primary data processed, 2026

The sample consisted of 300 respondents. Men represented 58.00 percent of the sample and women 42.00 percent. The manuscript does not report unnecessary sensitive demographic characteristics because they are not required to answer the research questions.

Table 2. Composite Measurement Model Evaluation

Construct	Dimension	Code	Weight	VIF
Artificial Intelligence Adoption	AI integration	AIA1	0.399	1.296
Artificial Intelligence Adoption	Data-driven decision support	AIA2	0.442	1.250
Artificial Intelligence Adoption	Operational automation	AIA3	0.463	1.267
Digital Capability	Digital literacy	DC1	0.381	1.257
Digital Capability	IT infrastructure agility	DC2	0.455	1.305
Digital Capability	Digital process integration	DC3	0.448	1.390
Entrepreneurial Orientation	Innovativeness	EO1	0.407	1.119
Entrepreneurial Orientation	Proactiveness	EO2	0.414	1.102
Entrepreneurial Orientation	Risk-taking	EO3	0.593	1.091
Entrepreneurial Performance	Financial growth	EP1	0.434	1.128
Entrepreneurial Performance	Operational efficiency	EP2	0.404	1.081

Entrepreneurial Performance	Innovation performance	EP3	0.576	1.108
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Source: Primary data processed, 2026

All reported VIF values ranged from 1.081 to 1.390, below the conservative threshold of 3.3. The result indicates that severe multicollinearity is not evident among the dimensions used to form the composite constructs. Each dimension was therefore retained because it is theoretically relevant and statistically acceptable within the reported composite measurement model.

Table 3. Hypothesis Testing Results

Hyp.	Relationship	β	t	p	Decision
H1	AIA -> EP	0.138	2.324	0.020	Supported
H2	AIA -> DC	0.635	8.976	<0.001	Supported
H3	DC -> EP	0.352	5.242	<0.001	Supported
H4	AIA -> DC -> EP	0.223	4.367	<0.001	Supported
H5	EO x DC -> EP	-0.034	1.354	0.176	Not supported
H6	Moderated indirect effect	-0.022	1.397	0.162	Not supported

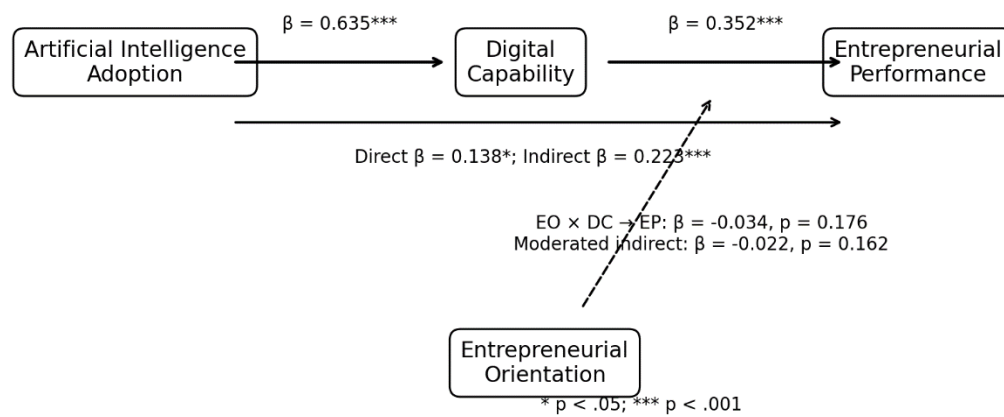
Source: Primary data processed, 2026

Artificial Intelligence Adoption had a positive direct effect on Entrepreneurial Performance ($\beta = 0.138$, $t = 2.324$, $p = 0.020$) and a strong positive effect on Digital Capability ($\beta = 0.635$, $t = 8.976$, $p < 0.001$). Digital Capability positively affected Entrepreneurial Performance ($\beta = 0.352$, $t = 5.242$, $p < 0.001$). The indirect effect through Digital Capability was significant ($\beta = 0.223$, $t = 4.367$, $p < 0.001$). In contrast, the EO $\times$ Digital Capability interaction was not significant ($\beta = -0.034$, $p = 0.176$), and the moderated indirect effect was also not significant ($\beta = -0.022$, $p = 0.162$).

Table 4. Effect Decomposition of AI Adoption on Entrepreneurial Performance

Effect	Coefficient	Interpretation
Direct effect	0.138	Significant
Indirect effect via Digital Capability	0.223	Significant
Implied total effect	0.361	Direct + indirect
Indirect share of total effect	61.8%	Substantial partial mediation

Source: Primary data processed, 2026

Figure 2. Structural Model Results

DISCUSSION

The first finding shows that AI adoption has a positive and statistically significant effect on entrepreneurial performance. This supports the view that intelligent technologies can improve business outcomes when they are used for decision support, automation, and customer-facing activities. The result is consistent with evidence that AI can strengthen SME performance, digital value creation, innovation, and competitiveness (Abrokwah-Larbi & Awuku-Larbi, 2024; Alsharah, 2025; Badghish & Soomro, 2024; Chen & Tajdini, 2025; Climent et al., 2024; Jalil et al., 2025; ul Haq et al., 2025). However, the direct coefficient is smaller than the mediated component, indicating that technology alone is not the main explanation for performance gains.

The second finding identifies digital capability as the central conversion mechanism. AI adoption strongly predicts digital capability, and digital capability significantly predicts entrepreneurial performance. The indirect effect from AI adoption to performance through digital capability is also significant. This pattern is aligned with capability-based explanations of digital transformation: organizations obtain value from technology when they develop skills, infrastructure, and process integration that enable repeated and coordinated use (Davies et al., 2023; Ferreira et al., 2024; Heredia et al., 2022; Karadağ et al., 2024; Kim & Jin, 2024; Prakasa & Juman, 2024; Proksch et al., 2024; Samsuden et al., 2024). The implied total effect is 0.361, of which the indirect component represents about 61.8 percent. The result therefore points to substantial partial mediation.

From an applied entrepreneurship perspective, the mediation result has a clear practical meaning. Programs that subsidize AI subscriptions or promote awareness may have limited impact if entrepreneurs lack digital literacy, interoperable information systems, data routines, and the managerial capacity to redesign processes. Capability-building interventions should therefore accompany technology-access initiatives. Training should move beyond generic digital skills toward task-specific applications such as data preparation, prompt design, decision verification, workflow integration, customer analytics, and basic AI governance. This emphasis is compatible with research on digital orientation, digital strategy, resilience, and sustainable technology use in SMEs (Abourokbah

et al., 2023; Kurniasari et al., 2023; Qader et al., 2022; Rupeika-Apoga et al., 2022; Trieu et al., 2023; Xu et al., 2022; Yu et al., 2022).

The moderation results are more nuanced. EO did not significantly strengthen the digital capability-performance relationship, and the moderated indirect effect was also not significant. The finding does not mean that innovativeness, proactiveness, and risk-taking are irrelevant. Rather, it indicates that within this sample, the benefits of digital capability were not statistically contingent on EO. One explanation is that when firms are still building foundational digital competence, technical and integrative capabilities may dominate strategic posture. Another possibility is that EO matters more for opportunity selection and innovation direction than for the conversion of digital capability into short-term performance. Similar contingency arguments appear in studies showing that EO-performance relationships vary with turbulence, resource conditions, innovation capability, and strategic alignment (Al-Momani et al., 2023; Dayan et al., 2023; Kukanja, 2024; Saleh & Athari, 2023; Satar et al., 2024; Zhang et al., 2024).

The study also contributes to the broader discussion on sustainable applied technologies. Although environmental sustainability was not measured directly, the evidence clarifies an organizational prerequisite for responsible and durable AI use: capability. Firms that understand data, integrate systems, and build repeatable digital processes are better positioned to evaluate AI outputs, avoid wasteful technology adoption, and adapt tools as business conditions change. Recent research links AI and digital capabilities with resilience, sustainable innovation, and long-term performance (Abdelfattah et al., 2025; Abdelwaheed et al., 2026; Ashkani et al., 2026; Fosso Wamba et al., 2024; Gao et al., 2025; Ragmoun & Aloulou, 2026; Sánchez-Rodríguez et al., 2025). The present results complement that literature by showing that the capability mechanism is empirically important even before explicit sustainability outcomes are introduced into the model.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that AI adoption improves entrepreneurial performance both directly and indirectly through digital capability. The strongest pathway runs from AI adoption to digital capability and then to performance, indicating that capability development is the primary mechanism through which AI becomes an entrepreneurial resource. Entrepreneurial orientation did not significantly strengthen either the digital capability-performance relationship or the mediated effect. For entrepreneurs, the practical recommendation is to treat AI adoption as a capability-building program rather than a software-purchase decision. For SME-support institutions, universities, and policymakers, digital entrepreneurship programs should combine AI access with data literacy, workflow integration, infrastructure readiness, and managerial routines for evaluating AI-assisted decisions. The study contributes an applied explanation of how AI adoption is converted into business value in an emerging-economy entrepreneurship context.

ADVANCED RESEARCH

The study has several limitations. The design is cross-sectional, so causal claims should be interpreted cautiously. The sample focuses on Indonesian entrepreneurs and business managers who already use digital technology, limiting generalization to non-digital ventures. The model also does not directly measure environmental performance, AI governance, data quality, technological turbulence, or organizational agility. Future research should use longitudinal or experimental designs, compare industries and regions, include objective performance indicators, and test whether green innovation, responsible AI practices, resilience, or digital governance extend the capability pathway identified here. Exact replication of the reported PLS-SEM model would also benefit from archiving the original SmartPLS project, bootstrap settings, and predictive-assessment outputs.

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