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Entrepreneurial Orientation and Startup Business Sustainability: The Mediating Role of the Quality of Artificial Intelligence Utilization

Yusril Ibnu Maulana, Meily Margaretha*

Master of Management Department, Universitas Kristen Maranatha, Bandung, Indonesia. *Email: meily_margaretha@yahoo.com

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ABSTRACT

The Indonesian startup ecosystem has experienced growing funding pressures and rising demands for operational efficiency, making business sustainability an increasingly important priority. Therefore, this study aims to examine the effect of entrepreneurial orientation on business sustainability, with the quality of artificial intelligence (AI) utilization serving as a mediator among startup employees in Greater Jakarta and Bandung. Using a causal quantitative design, the study surveyed 107 respondents selected through purposive sampling. Data were analyzed using Partial Least Squares Structural Equation Modeling in SmartPLS 4, and the obtained results showed that entrepreneurial orientation positively affected both business sustainability ($\beta = 0.380$; $P < 0.001$) and the quality of AI utilization ($\beta = 0.603$; $P < 0.001$). The quality of AI utilization was also observed to positively affect business sustainability ($\beta = 0.376$; $P = 0.001$). Accordingly, the obtained indirect effect of 0.227 ($P = 0.001$) confirms partial mediation, with a VAF of 37.4%. These findings expand the Resource-Based view (RBV) by positioning entrepreneurial orientation as a strategic capability and the quality of AI utilization as a technological-operational capability that transforms the orientation into business efficiency, productivity, adaptability, and resilience. Practically, startups need to integrate an entrepreneurial culture, AI literacy, data governance, infrastructure support, and AI impact evaluation into respective business processes.

Keywords: Entrepreneurial Orientation, Quality of Artificial Intelligence Utilization, Business Sustainability, Startups, Partial Least Squares-Structural Equation Modeling
JEL Classifications: M13, L26, M15, L25, O33

1. INTRODUCTION

Digital startups have become an essential part of Indonesia's economic transformation by creating new business models, driving service innovation, and expanding employment opportunities. This growth is supported by digital infrastructure, investment, government policies, and a growing entrepreneurial ecosystem (Iskandar, 2024; Judijanto, 2024). However, the expansion previously driven by the growth-at-all-costs paradigm is facing a sharp correction particularly because venture capital funding is declining, the cost of capital rising, and investors are demanding a clearer path to profitability. This phase, often referred to as tech winter, is prompting startups to retrench, restructure, postpone expansion, and sharpen respective business priorities (DiscoveryShift, 2026; Febrina and Tewu, 2023). As a result, the measure of success has shifted from user growth and valuation to efficiency, operational resilience, governance, and the ability to sustain the business over the long term.

Mounting funding pressures confirm that startup sustainability cannot depend solely on external resources. The Resource-Based View (RBV) holds that sustainable advantage typically arises from valuable, rare, difficult-to-imitate, and well-organized internal resources and capabilities (Barney, 1991; Barney and Hesterly,

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2021). In a dynamic startup environment, these capabilities extend beyond technology to include strategic orientation, a culture of innovation, learning capabilities, and employee competencies for transforming technology into business value. The dynamic capabilities perspective complements this explanation by emphasizing the ability of an organization to perceive change, seize opportunities, and continuously reconfigure resources (Teece, 2007).

Entrepreneurial orientation has been observed to be a relevant strategic capability in dynamic startup environments. This construct reflects a tendency toward innovation, proactivity, risk-taking, autonomy, and competitiveness when facing opportunities and threats (Covin and Slevin, 1989; Lumpkin and Dess, 1996). In startups, entrepreneurial orientation can drive business model experimentation, accelerated decision-making, product customization, and the pursuit of more efficient ways of working. Empirical evidence drawn from small and medium-sized enterprises also suggests that entrepreneurial orientation is related to sustainability and performance, particularly when translated into innovation capabilities or other internal capabilities (Ismaeni et al., 2024; Ngo et al., 2023).

In the present business landscape, artificial intelligence (AI) offers considerable opportunities to improve productivity, automation, data analysis, and decision quality. However, owning AI applications does not automatically generate value. The technology typically becomes a capability only when organizations consistently integrate data, infrastructure, human expertise, managerial support, and change processes (Mikalef and Gupta, 2021). Considering the presented background, the present study uses the concept of AI utilization quality to describe the depth of AI integration into organizational work and processes, not only the frequency of use. This quality covers data and infrastructure readiness, resource support, technical talent, managerial understanding, collaboration, and the ability to manage resistance to change.

Prior studies have generally examined entrepreneurial orientation, AI adoption, and performance separately. Investigations on entrepreneurial orientation have focused more on small and medium-sized enterprise (SME) owners or the corporate level, while explorations of AI capabilities have largely centered on large organizations. Limited evidence exists explaining how entrepreneurial orientation translates into business sustainability through the quality of AI utilization among startup employees in developing countries. This gap is significant because startup employees operate within relatively lean structures and face constant demands for innovation, efficiency, and everyday technology use.

Based on the discussion above, this study aims to analyze the effect of entrepreneurial orientation on business sustainability, examine the effect of entrepreneurial orientation on the quality of AI utilization, assess the effect of the quality of AI utilization on business sustainability, and determine the mediating role of AI utilization quality in the relationship. Its novelty is in integrating the three constructs within the RBV framework, positioning AI utilization quality as a mediator between technology and operations, and applying the model to startup employees in Greater Jakarta and Bandung. The findings are expected to enrich the strategic management literature and provide a practical basis for startups seeking to integrate entrepreneurial culture with AI utilization governance.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The RBV treats entrepreneurial orientation and the quality of AI utilization as intangible resources that can differentiate a startup's ability to sustain its business. Entrepreneurial orientation guides opportunity identification, experimentation, and decision-making under uncertainty, while the quality of AI utilization determines an organization's ability to capture technological value through its work processes. Generally, business sustainability is understood as the ability to maintain operations and growth through economic, social, and operational resilience, as well as attention to resources and the environment. In the startup context, the economic and operational dimensions are prerequisites for consistently maintaining social and environmental contributions (Elkington, 1997; Palazzo, 2022).

Entrepreneurial orientation enables startups to respond to change faster than organizations that maintain old routines. Innovativeness drives the development of new products and processes, proactivity helps anticipate change, and courage in the face of uncertainty supports strategic decisions when resources are limited. Ismaeni et al. (2024) showed that entrepreneurial orientation is relevant to the sustainability of Indonesian SMEs, while Ngo et al. (2023) reported how its effect on performance can operate through internal capabilities. Based on the RBV, a strong entrepreneurial orientation is expected to enhance the ability of a startup to maintain business relevance, efficiency, and resilience.

H_1: Entrepreneurial orientation positively affects business sustainability.

An innovative, proactive, and experimental environment further motivate employees to explore new technologies. Upadhyay et al. (2023) found that entrepreneurial orientation increases AI adoption intentions through business innovativeness. Al-Shami et al. (2022) showed that entrepreneurial orientation needs to be translated into strategic direction to generate innovation outcomes. Therefore, an entrepreneurial culture is expected to strengthen the managerial support, learning, resource allocation, and collaboration necessary to leverage AI effectively.

H_2: Entrepreneurial orientation positively affects the quality of Artificial Intelligence utilization.

The Task-Technology Fit principle explains that technology delivers performance when its capabilities match task demands and are used effectively (Goodhue and Thompson, 1995). In startups, high-quality AI utilization can reduce routine work, accelerate analysis, improve service consistency, and facilitate data-driven decisions. Mikalef and Gupta (2021) show that AI capabilities enhance creativity and performance when technology,

data, and human expertise are integrated. Accordingly, high-quality AI utilization is expected to help startups improve efficiency, adaptability, and resilience, thereby supporting business sustainability.

H_3: The quality of Artificial Intelligence utilization positively affects business sustainability.

Entrepreneurial orientation represents the strategic drive, while the quality of AI utilization serves as the execution mechanism. An entrepreneurial vision does not necessarily lead to sustainability unless it is adopted into work practices that increase productivity and efficiency. Prior studies have shown that innovation capability and strategic direction can mediate the relationship between entrepreneurial orientation and performance (Al-Shami et al., 2022; Ngo et al., 2023). In this study, the quality of AI utilization is positioned as a technological-operational capability that partially channels the effect of entrepreneurial orientation on business sustainability.

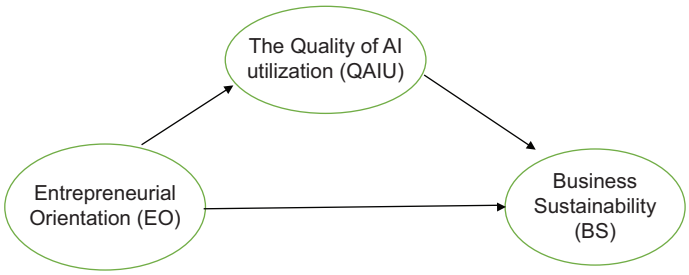
H_4: The quality of Artificial Intelligence utilization mediates the effect of entrepreneurial orientation on business sustainability.

The study framework is presented in Figure 1.

3. METHODOLOGY

The present study adopted a quantitative approach with a causal design and cross-sectional data collection. Its population comprised employees of technology-based startups in the Greater Jakarta and Greater Bandung areas. The sample was selected using purposive sampling based on the following criteria, being a permanent, contract, or full-time employee with operational ties; working for a startup entity in one of the study areas; having a minimum tenure of 6 months; and regularly using computers or digital applications. The questionnaire was distributed online through startup communities, professional social media, corporate networks, and survey platforms.

Figure 1: Study framework



The minimum sample size was determined through an a priori power analysis using G*Power. With two predictors, an effect size of 0.15, a significance level of 0.05, and a power of 0.95, the minimum required sample size was 107 respondents. All 107 responses meeting the criteria were included in the analysis. The instrument used a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 explained the operationalization of all constructs in this study. Entrepreneurial orientation was measured with seven items adapted from Clark et al. (2024), quality of AI utilization with seven items adapted from Mikalef and Gupta (2021), and business sustainability with six items formulated based on Palazzo (2022). After evaluating the measurement model, three indicators of entrepreneurial orientation were removed due to low outer loadings, resulting in a final model comprising four indicators of entrepreneurial orientation, seven indicators of AI utilization quality, and six indicators of business sustainability.

The analysis was conducted using Partial Least Squares Structural Equation Modeling with SmartPLS 4, while the measurement model was assessed through outer loading, Cronbach's alpha, composite reliability, average variance extracted (AVE), and Heterotrait-Monotrait ratio (HTMT). The structural model was evaluated using the variance inflation factor (VIF), coefficient of determination, effect size, path coefficient, and specific indirect effects. Significance was tested through bootstrapping of 5,000 subsamples with criteria of t-statistics >1.96 and $P < 0.05$ (Hair et al., 2022; Henseler et al., 2015). Mediation was classified as partial when both direct and indirect effects were significant.

4. RESULTS AND DISCUSSION

In Table 2 we can see that the largest age group was 25-30 years old (38.3%), with the highest educational attainment being a bachelor's or diploma four (51.4%), and the majority held staff or intern positions (56.1%). Regarding experience, the 2-3 years group was the largest category (29.0%). Nearly half of the respondents worked in software and digital services startups (47.7%), followed by e-commerce and retail technology (18.7%). This composition confirms that the data primarily represents young employees at the operational level working in sectors with high technology intensity.

The average entrepreneurial orientation score of 4.409 reflects a very high perception, particularly regarding enthusiasm for responding to competitive challenges and the tendency to try new approaches. The quality of AI utilization averaged 4.126, categorized as high. Support for processing infrastructure,

Table 1: Operationalization of study constructs

Construct	Measurement focus	Initial/final indicators	Primary source
Entrepreneurial orientation	Responding to competitive challenges, unique ways of working, experimentation, and anticipating change.	7/4	Clark et al. (2024)
Quality of AI utilization	Data, infrastructure, funding, AI talent, managerial understanding, collaboration, and resistance management.	7/7	Mikalef and Gupta (2021)
Business sustainability	Economic performance, employee satisfaction, social recognition, resource utilization, and cleanliness.	6/6	Palazzo (2022)

funding for AI initiatives, and availability of technical talent, however, scored relatively lower than the other aspects. Business sustainability averaged 4.288, categorized as very high.

Evaluation of the measurement model in Table 3 yielded outer loadings ranging from 0.709 to 0.868. All constructs had Cronbach's alpha and composite reliability above 0.70, and AVE above 0.50. The highest HTMT value was 0.732, thereby meeting discriminant validity. Three entrepreneurial orientation indicators, EO1, EO2, and EO7 were eliminated due to relatively low loadings. These results confirm that the final instrument meets internal reliability and convergent validity, and also point to the need for adjustments to the entrepreneurial orientation scale when used with employee respondents rather than business owners.

The structural model showed no multicollinearity issues, as all VIFs fell between 1.000 and 1.571. The R-square value for AI utilization quality of 0.363 confirms that entrepreneurial orientation accounts for 36.3% of the variation in the mediator. The R-square value for business sustainability of 0.458 confirms that entrepreneurial orientation and AI utilization quality together account for 45.8% of the variation in business sustainability. Entrepreneurial orientation had a large effect on AI utilization quality (f-square = 0.571), while the effects of entrepreneurial orientation and AI utilization quality on business sustainability each registered as moderate (0.169 and 0.166, respectively).

Table 2: Respondent profile and key descriptive statistics

Aspect	Dominant category	Frequency	Percentage/ mean
Gender	Male	71	66.4
Age	25-30 years old	41	38.3
Education	Bachelor's/diploma 4	55	51.4
Position	Staff/intern	60	56.1
Sector	Software and digital services	51	47.7
Entrepreneurial orientation	Very high	107	Mean 4.409
Quality of AI utilization	High	107	Mean 4.126
Business sustainability	Very high	107	Mean 4.288

Table 3: Measurement model evaluation summary

Construct	Loading	Alpha	CR	AVE	HTMT max.
Entrepreneurial orientation	0.716-0.809	0.767	0.851	0.588	0.732
Quality of AI utilization	0.709-0.838	0.899	0.920	0.623	0.702
Business sustainability	0.713-0.868	0.886	0.913	0.638	0.732

Based on the observations made, all the proposed study hypotheses were supported, as shown in Table 4. The direct effect of entrepreneurial orientation on business sustainability remained significant after the mediator was included. The indirect effect through AI utilization quality was also significant at 0.227. The total effect of entrepreneurial orientation on business sustainability was 0.606, producing a VAF of 37.4%. Therefore, AI utilization quality partially mediates the relationship between entrepreneurial orientation and business sustainability. The results of the hypothesis testing and the relationships among the variables were presented in Figure 2 as follows.

4.1. Discussions

The positive effect of entrepreneurial orientation on business sustainability confirmed that innovative, proactive, experimental, and change-responsive behavior is a strategic resource for startups. When external funding is limited, startups need internal capabilities to shift priorities, improve processes, and maintain the relevance of respective business models. These results were consistent with the RBV and supported the findings of Ismaeni et al. (2024), who established that entrepreneurial orientation is related to business sustainability. The coefficient of 0.380 further confirmed that strategic orientation alone is not sufficient, as sustainability requires an execution mechanism that transform orientation into operational benefits.

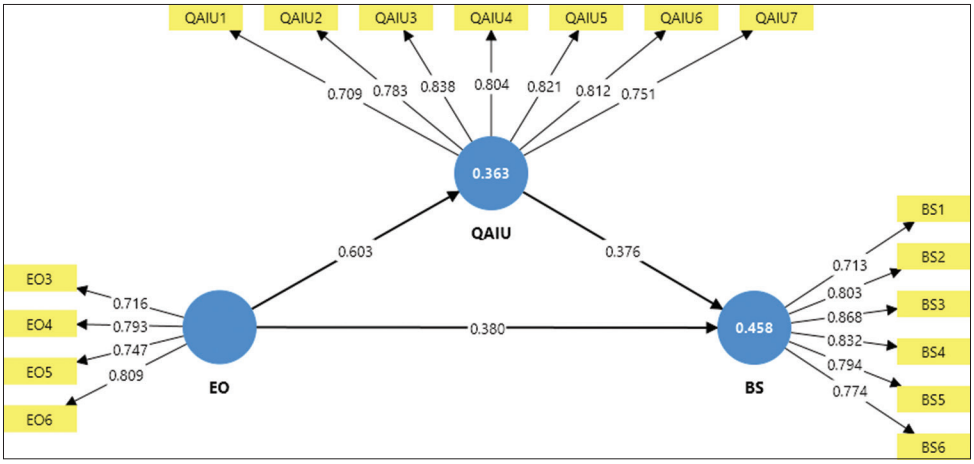
The effect of entrepreneurial orientation on AI utilization quality was the strongest relationship in the model. This finding confirmed that AI adoption is not solely dependent on application availability. Environments that drive experimentation, learning, and proactive action are more positioned to provide managerial support, shared goals, and space for employees to integrate AI into their tasks. These results were consistent with Upadhyay et al. (2023), who showed that entrepreneurial orientation drives AI adoption through business innovation, and with Al-Shami et al. (2022), who emphasized the importance of strategic direction in transforming entrepreneurial orientation into innovation outcomes.

During the course of this study, AI utilization quality was shown to strengthen business sustainability. Within the RBV framework, AI functions as a complementary capability built from data, infrastructure, human resources, managerial understanding, collaboration, and change management. Startups benefited when AI was used to accelerate processes, improve accuracy, assist with decisions, and expand capacity without proportional cost increases. This finding supported Mikalef and Gupta (2021), who argued

Table 4: Hypothesis testing results

Hyphothesis	Track	β	t	P	Decision
H_1	Entrepreneurial orientation→Business sustainability	0.380	4.246	<0.001	Accepted
H_2	Entrepreneurial orientation→Quality of AI utilization	0.603	8.733	<0.001	Accepted
H_3	Quality of AI utilization→Business sustainability	0.376	3.434	0.001	Accepted
H_4	Entrepreneurial orientation→Quality of AI utilization→Sustainability	0.227	3.304	0.001	Accepted

Figure 2: Partial least squares test results model



that the business value of AI arises from resource orchestration rather than from the technology itself. The relatively lower scores recorded for infrastructure, funding, and technical talent confirmed that these areas warrant prioritization for improvement.

Partial mediation suggested two mechanisms, first, entrepreneurial orientation could directly strengthen sustainability through strategic adaptation and innovative decisions. Second, this effect operated partly through AI utilization quality. Entrepreneurial orientation provided the strategic leverage, while AI provided the technological-operational mechanism that translated the leverage into efficiency, productivity, and resilience. These findings extended prior mediation studies that used strategic direction or innovation capability as mediators (Al-Shami et al., 2022; Ngo et al., 2023) by positioning AI utilization quality as a more contextually appropriate mediator for digital startups.

The theoretical contribution of this study is primarily in extending the RBV to the relationship between entrepreneurial orientation at the workplace level, AI utilization capabilities at the employee level, and business sustainability. The findings also emphasized that organizational-level capabilities can be observed through the experiences of employees directly engaged in digital processes. The elimination of three entrepreneurial orientation indicators further suggested that scales developed for individual business owners are not entirely appropriate for capturing employee perceptions of the organization, making it important to adjust the level of analysis and context in future instrument development. The results of the hypothesis testing and the relationships among the variables were presented in Figure 2 as follows.

5. CONCLUSION, LIMITATIONS AND SUGGESTIONS FOR FURTHER STUDIES

In conclusion, this study established that entrepreneurial orientation improves startup business sustainability both directly and through AI utilization quality. The factor also proved to be a strong predictor of AI utilization quality, which essentially strengthened business sustainability. Partial mediation with a VAF of 37.4% confirmed that entrepreneurial strategy needs to be adopted into technological-operational capabilities to generate greater impact. Accordingly, the combination of an innovative culture and high-quality AI utilization helps startups build efficiency, productivity, adaptability, and resilience in the face of mounting funding pressures.

Based on the observations, startups need to prioritize AI adoption by developing employee literacy and skills, strengthening data and processing infrastructure, as well as providing adequate funding for AI initiatives. Effective AI adoption also requires ethical guidelines, data security, clearly defined responsibilities, change communication, and performance indicators such as time savings, service quality, cost management, productivity, and decision speed. Positioning AI as a tool for employee empowerment rather than workforce reduction can further strengthen organizational acceptance. Beyond startup management, investors, incubators, and policymakers should assess the quality of internal capabilities in addition to user growth and access to funding.

The present study has four limitations, first, business sustainability, which is an organizational-level construct, was measured through employee perceptions making the construct potentially subject to perceptual bias. Second, the sample size of 107 respondents, though meeting the minimum power analysis threshold, limits the generalizability of the findings. Third, the cross-sectional design does not capture changes in the relationships between variables over time. Fourth, the study context is limited to technology startups in Greater Jakarta (Jabodetabek) and Greater Bandung. In order to address the identified limitations, this exploration recommend that future studies draw on larger samples, objective company data, managerial respondents, longitudinal or mixed-methods designs, and more diverse sectoral and regional contexts. Further development of the AI utilization quality construct could also incorporate AI governance, ethics, data security, talent readiness, digital culture, leadership support, and organizational learning capabilities.

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