Strategic Integration of Artificial Intelligence: The Mediating Role of Dynamic Capabilities and Moderating Influence of Environmental Turbulence in Developing Economies

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Abstract

This research investigates how organizations in developing nations focusing on Indonesia can effectively embed Artificial Intelligence (AI) into their strategic operations to boost competitiveness and support the achievement of Sustainable Development Goals (SDGs). Drawing upon Dynamic Capability Theory (DCT) and the Technology-Organization-Environment (TOE) framework, the study examines the role of AI readiness in fostering strategic AI integration, with dynamic capabilities acting as a mediating mechanism and environmental turbulence serving as a moderating factor. A survey of 150 industry managers in Central Java was conducted, with data analyzed using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach. Results indicate that organizations with higher AI readiness tend to develop stronger dynamic capabilities, which subsequently enhance their strategic integration of AI. Additionally, the study finds that environmental turbulence can amplify or diminish the influence of dynamic capabilities. Theoretically, the research extends the TOE framework by incorporating dynamic capability perspectives, while practically offering guidance for business leaders and policymakers aiming to implement AI in ways that are both effective and sustainable.

Keywords : AI integration, dynamic capabilities, environmental turbulence, organizational performance, Sustainable Development Goals (SDGs).

INTRODUCTION

In alignment with the global Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure) and SDG 8 (Decent Work and Economic Growth), digital transformation driven by intelligent technologies like Artificial Intelligence (AI) has become a cornerstone for enhancing organizational competitiveness and sustainability in a disruptive era. AI's role has exceeded that of a simple operational tool, evolving into a strategic pillar essential for adopting innovation, optimizing business efficiency, and enabling adaptive, data-informed decision-making [1], [2]. Supporting this, a McKinsey study indicates that enterprises which implement AI at a strategic level exhibit heightened resilience against market volatility and technological shifts [3].

Although its significant potential, the implementation of Artificial Intelligence (AI) within organizations especially in developing nations such as Indonesia yields inconsistent outcomes. Even though some entities have successfully leveraged AI for a competitive edge, many others have experienced stagnation resulting from a superficial adoption that fails to substantially enhance organizational performance [4]. This disparity is attributed to a range of internal factors, including technological readiness, organizational structure, data quality, and the degree of top management support [5], [6] . Additionally, challenges such as limited digital literacy and organizational resistance to change further contribute to the high failure rate of AI integration within local industrial sectors [7] .

While prior research has frequently worked with individual-level frameworks like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) that center on end-user perceptions [6], [8] such models are often considered insufficient for capturing the strategic, organization-wide dynamics characteristic to AI adoption. This process necessitates an understanding of complex interactions across functions, structures, and formal policies.

Within conditions of significant environmental turbulence characterized by market volatility, rapid technological change, fluctuating regulations, and geopolitical tensions, organizations are compelled to cultivate adaptive capabilities to maintain competitiveness [4], [10]. Within this context, Dynamic Capabilities Theory provides a relevant framework for understanding a firm's ability to navigate change through processes of sensing opportunities, seizing them, and transforming its resource base [1]. However, empirical research that specifically investigates the mediating function of dynamic capabilities and the moderating effect of environmental turbulence on strategic AI integration remains scarce, particularly within the industrial setting of developing nations such as Indonesia.

Consequently, this study aims to construct a conceptual model grounded in Dynamic Capability Theory and the Technology-Organization-Environment (TOE) Framework. The model integrates four principal variables: AI readiness, dynamic capabilities (functioning as a mediator), environmental turbulence (acting as a moderator), and strategic AI integration (serving as the dependent variable). This approach is designed to offer a more comprehensive and significant

understanding of the organizational-level process behind AI adoption and integration by concurrently accounting for the influence of both internal and external factors.

Theoretical contributions of this research include an extension of the Technology-Organization-Environment (TOE) Framework through its integration with a dynamic capabilities perspective, thereby advancing the understanding of AI-driven digital transformation processes. On a practical level, the findings are anticipated to yield strategic guidance for organizational leaders, digital policy formulators, and relevant stakeholders, assisting in the optimization of AI implementation strategies that are not only technologically effective but also aligned with the objectives of the Sustainable Development Goals (SDGs).

LITERATURE REVIEW

Grand Theory: Dynamic Capability Theory (DCT)

Dynamic Capability Theory [11] suggests that an organization's capacity to successfully navigate environmental shifts is largely dependent on its ability to dynamically build, integrate, and reconfigure its internal resources and competencies. This theory underscores three critical micro-foundations: sensing (identifying opportunities and threats), seizing (mobilizing resources to capitalize on opportunities), and transforming (restructuring the organization's asset base). Within the realm of strategic AI integration, these dynamic capabilities allow firms to integrate original technologies, adapt their operational processes, and ultimately forge a sustainable competitive advantage [1], [12]. This theoretical perspective is intrinsically aligned with the aims of the Sustainable Development Goals (SDGs), specifically Goal 9 concerning industry, innovation, and infrastructure, as organizations adept at adapting to technological innovation are better positioned to generate inclusive and sustainable economic growth [13] .

Contextual Framework: Technology-Organization-Environment (TOE)

The Technology-Organization-Environment (TOE) framework [9] posits that technological adoption is shaped by three principal contexts: the technological context (e.g., AI readiness), the organizational context (e.g., structure, culture, and capabilities), and the external environmental context (e.g., market and regulatory turbulence). This study utilizes the TOE framework as a foundational basis for understanding that successful AI integration is depend not only upon internal technological preparedness but also on external factors that lie beyond an organization's direct control (Alghamdi & Agag, 2023).Specifically, a turbulent environment, characterized by rapidly shifting regulations or technological disruptions, can act as a critical moderating variable that either increases or slows down the efficiency of dynamic capabilities in an achieving strategic AI integration [15].

Strategic Integration of AI and Organizational Performance

Strategic AI integration denotes the process of embedding artificial intelligence technology into an organization's core strategy to generate added value, enhance operational efficiency, and secure a sustainable competitive advantage [3]. This process extends beyond simple technological deployment to include necessary adaptations in organizational structure, business processes, and

corporate culture to ensure alignment [14]. Empirical studies indicate that such strategically aligned integration significantly boosts organizational innovation, productivity, and overall market competitiveness [8].

AI Readiness and Dynamic Capabilities

Organizations possessing a high degree of technological readiness encompassing digital infrastructure, IT resources, and relevant technical competencies are better positioned to promote strong dynamic capabilities. This foundational readiness provides the essential basis for firms to adjust to new technological knowledge, enhance their market intelligence, and respond with agility to emerging opportunities. As articulated by [11], technological readiness directly underpins the core pillars of dynamic capabilities: it enhances the capacity for sensing new opportunities and threats, improves the ability for seizing those opportunities, and facilitates the transforming of organizational structures and resources. This relationship is supported empirically, with studies by [1], [16], [17], [18]confirming that technological readiness is a critical antecedent to the development of adaptive capabilities within digitally transforming organizations.

H1: In this hypothesis AI readiness has a positive impact and significant effect on dynamic capabilities.

Dynamic Capabilities and Strategic Integration of AI.

Dynamic capabilities empower organizations to excel minimal operational adoption of AI, enabling its integration into long-term strategic vision. The sensing, seizing, and transforming capacities are fundamental to aligning AI utilization with main strategic goals, including enhancing operational efficiency, adopting product innovation, and developing data-driven service offerings. Research by [19], [20] demonstrates that firms exhibiting strong dynamic capabilities are more proficient at reengineering internal processes and promoting original AI-centric business models, which in turn fortifies the depth and success of strategic AI integration.

H2: Dynamic capabilities have a positive and significant effect on the strategic integration of AI.

AI Readiness and Strategic Integration of AI

A state of AI readiness provides an essential foundation that allows organizations to effectively position artificial intelligence as a core component of their overarching business strategy. A mature technological infrastructure facilitates seamless integration of AI across diverse functional areas and business units. Organizations that are technologically prepared can respond more swiftly to market shifts and adapt their operational processes to incorporate new technologies. Empirical studies by [3], [18], [21]) identify technological readiness as a pivotal factor for successfully embedding AI into core organizational functions, including strategic decision-making, customer service operations, and intelligent automation systems.

H3: In the third hypothesis AI readiness has a positive impact and significant effect on the strategic integration of AI.

Dynamic Capabilities as Mediator

Dynamic capabilities function as a critical internal mechanism that enables an organization to translate its foundational technological readiness into a sustainable strategic advantage [11]. This involves the synergistic execution of several key processes: absorbing external knowledge (absorptive capacity), identifying and capitalizing on opportunities presented by AI (sensing and seizing), and fundamentally reconfiguring business processes (transforming). Empirical evidence indicates that firms possessing strong dynamic capabilities are significantly more proficient at integrating advanced digital technologies, such as AI, directly into their core business strategies [1], [19], [22]. Consequently, within the proposed conceptual model, dynamic capabilities are theorized to act as a mediating variable that explains the relationship between AI readiness and the outcome of strategic AI integration.

H4: Dynamic capabilities mediate the effect of AI readiness on strategic AI integration.

Environmental Turbulence as a Moderator

Environmental turbulence is characterized by rapid and unpredictable shifts within the market, technological, and regulatory landscapes [23]. This state of high uncertainty can increase the critical importance of an organization's dynamic capabilities. Within the context of AI adoption, a volatile environment may act as a catalyst, compelling firms to accelerate the integration of new technologies to maintain competitiveness [24]. Consequently, within this conceptual model, environmental turbulence is theorized to function as a moderating variable that either strengthens or weakens the relationship between dynamic capabilities and the strategic integration of AI.

H5: Environmental turbulence moderates the effect of dynamic capabilities on the strategic integration of AI.

METHOD

This study uses an explanatory quantitative design to examine causal relationships among AI Readiness, Dynamic Capabilities, Environmental Turbulence, and Strategic Integration of AI. Structural Equation Modeling–Partial Least Squares (SEM-PLS) was applied for hypothesis testing due to its suitability for complex models with mediating and moderating effects. The research was conducted in Central Java, targeting medium- and large-scale industrial firms adopting AI in operations and strategies. Based on data from the Central Java Industry Office (2024) and industry associations, at least 40 AI-oriented manufacturing and service companies across cities such as Semarang, Surakarta, Kudus, Jepara, and Pekalongan were identified. A purposive sampling technique selected firms that: (1) operate in Central Java, (2) apply AI in at least two functions, (3) have a formal digital/IT team, and (4) consent to participate. The unit of analysis was mid- and senior managers involved in digital transformation, with a minimum target of 150 respondents, meeting SEM-PLS requirements. Data were collected from structured questionnaires (five-point Likert scale) and secondary sources such as annual reports, digital strategies, and transformation documents. AI Readiness was measured with six indicators (infrastructure, HR competence, strategic alignment). Dynamic Capabilities were assessed

through nine indicators (sensing, seizing, transforming). Environmental Turbulence used six indicators (market, regulatory, technological uncertainty). Strategic Integration of AI was captured by seven indicators (strategy, structure, processes, culture). All instruments were validated against prior literature, with construct validity and reliability confirmed during the SEM-PLS outer model analysis.

RESULT AND DISCUSSION

Result

The Partial Least Squares (PLS) statistical technique was utilized to evaluate the study's predictive hypotheses. This method is appropriate as it focuses on minimizing the residual variance of the dependent variables during the estimation of the model's parameters (Ghozali & Latan, 2015). For this research, data collection was achieved through 150 questionnaires distributed via online and offline channels using Google Forms. The dataset was compiled in its entirety, ensuring a complete 100 percent response rate, and was subsequently prepared for statistical analysis.

An analysis of the respondent demographic data revealed a significant gender disparity, with male participants comprising 82% of the sample and female participants making up the remaining 18%. The majority of respondents fell within the 30-45 year age bracket, a demographic typically characterized as a highly productive and active segment of the workforce. Regarding professional experience, a substantial proportion of participants (65%) reported having over ten years of tenure within their respective organizations.

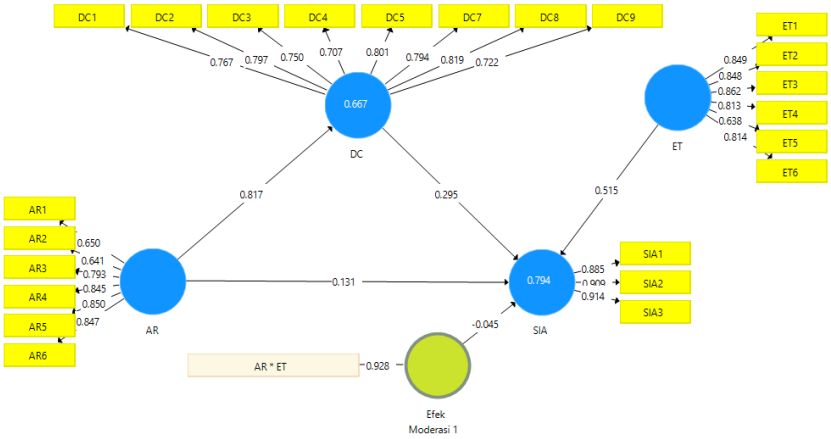

Figure 1. PLS Algorithm Analysis

The Partial Least Squares (PLS) analysis was performed in two sequential stages. During the initial evaluation of the measurement model, several indicators specifically SIA4, SIA5, SIA6, and SIA7—demonstrated loading factor values below the recommended threshold of 0.7

Table 1. Construct Reliability dan Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
AR	0.865	0.879	0.900	0.602
DC	0.902	0.905	0.921	0.594
ET	0.891	0.901	0.918	0.652
Efek Moderasi 1	1.000	1.000	1.000	1.000
SIA	0.886	0.887	0.930	0.815

The results confirm that the model meets reliability and convergent validity standards, with Cronbach's Alpha and composite reliability above 0.70 and AVE values exceeding 0.50 (Hair et al., 2017). The model explains 66.5% of the variance in Dynamic Capabilities (DC) and 78.9% in Strategic Integration of AI (SIA), indicating strong explanatory power and supporting the model's validity.

Table 2. Path Coefficients

	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	T Statistik (|O/STDEV|)	P Values
AR -> DC	0.817	0.824	0.029	28.539	0.000
AR -> SIA	0.131	0.130	0.084	1.553	0.121
DC -> SIA	0.295	0.291	0.092	3.197	0.001
Efek Moderasi 1 -> SIA	-0.045	-0.041	0.043	1.046	0.296
AR -> DC -> SIA	0.241	0.239	0.076	3.174	0.002

The path analysis shows that AI Readiness (AR) significantly affects Dynamic Capabilities (DC) ($\beta = 0.817$, $p < 0.001$), but its direct effect on Strategic Integration of AI (SIA) is insignificant ($\beta = 0.131$, $p > 0.05$). In contrast, DC has a positive and significant effect on SIA ($\beta = 0.295$, $p = 0.001$), while the moderating effect of environmental turbulence is not supported ($\beta = –0.045$, $p > 0.05$). Mediation analysis confirms that DC significantly mediates the AR–SIA relationship ($\beta = 0.241$, $p = 0.002$), indicating that AR enhances SIA indirectly through DC rather than directly.

Discussion

This study explored the mechanisms influencing the Strategic Integration of AI (SIA) in developing economies, with evidence from Central Java. The most consistent finding is the strong and significant relationship between AI Readiness (AR) and Dynamic Capabilities (DC). This implies that firms equipped with adequate technological infrastructure, competent human resources, and robust data systems are more capable of developing adaptive capacities needed to

manage change. In this sense, AI readiness is not an end in itself but a foundation that enables organizations to build agility and resilience in facing technological and market shifts [16]. The results also confirm that DC has a positive and significant effect on SIA. This emphasizes that acquiring advanced AI tools alone is insufficient; organizations must also be able to reconfigure processes, adapt structures, and continuously upgrade skills to maximize AI's potential. Firms with strong dynamic capabilities are better positioned to embed AI across functions and strategies, moving beyond isolated pilot projects toward sustained competitive advantage [7], [12], [25]. For industries in Central Java, this highlights the necessity of balancing investment in technology with organizational agility to remain competitive globally. Interestingly, the study found that AR does not directly influence SIA. Instead, its effect is fully realized through DC as a mediating variable. This shows that readiness provides the resources and infrastructure, but only organizations with agility in sensing, seizing, and transforming can translate readiness into strategic outcomes [14]. This mediating role enriches the Technology-Organization-Environment (TOE) framework by integrating Dynamic Capability Theory, clarifying that readiness alone is a necessary but insufficient condition for strategic AI integration [23].

Finally, the moderating role of environmental turbulence was not supported. This suggests that, in the case of Central Java, internal factors such as readiness and dynamic capabilities are more decisive than external market or regulatory uncertainty. Firms with strong internal capacities appear able to pursue AI integration regardless of turbulence, which contrasts with studies positioning turbulence as a major driver of technology adoption [24]. This underlines the primacy of internal preparedness over external conditions in shaping successful AI integration in developing economies.

Conclusion

This study confirms that successful strategic AI integration in developing economies is determined by a synergistic combination of technological readiness and robust organizational dynamic capabilities. While AI readiness does not exert a direct effect on integration, it fulfills a crucial indirect role by enabling the development of dynamic capabilities. In this relationship, readiness acts as the essential "fuel," while dynamic capabilities function as the "engine" that propels an organization toward strategic AI adoption. Furthermore, the external environment's influence was statistically insignificant, underscoring that internal organizational factors are the dominant determinants of success. The theoretical implication of this work enriches the digital transformation literature by solidifying the role of dynamic capabilities as the pivotal mediating mechanism between readiness and integration. For practitioners, these findings underscore that investments in technology must be balanced with initiatives to improve adaptive capacities, including employee training, flexible organizational structures, and a culture of continuous learning. For policymakers, the results provide an empirical basis for formulating strategies that

enhance digital readiness and provide regulatory support to strengthen organizational capabilities for strategic AI adoption.

This research is subject to several limitations. Firstly, its exclusive focus on the industrial sector within Central Java constrains the generalizability of the findings to other industries or geographical regions. Secondly, the dependence on self-reported questionnaire data introduces the potential for respondent bias. Thirdly, the cross-sectional design captures causal relationships at a single point in time, thereby limiting insights into longitudinal dynamics and the evolution of AI integration. Consequently, future studies are recommended to adopt a longitudinal approach, broaden the sampling to include diverse sectors, and conduct a more granular investigation into the contextual factors that may shape strategic AI adoption

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References

[1] F. Gama and S. Magistretti, "Artificial intelligence in innovation management: A review of innovation capabilities and a taxonomy of <scp>AI</scp> applications," *Journal of Product Innovation Management*, vol. 42, no. 1, pp. 76–111, Jan. 2025, doi: 10.1111/jpim.12698.

[2] A. Tursunbayeva and H. Chalutz-Ben Gal, "Adoption of artificial intelligence: A TOP framework-based checklist for digital leaders," *Bus Horiz*, vol. 67, no. 4, pp. 357–368, Jul. 2024, doi: 10.1016/j.bushor.2024.04.006.

[3] K. McElheran, M.-J. Yang, E. Brynjolfsson, and Z. Kroff, "The Rise of Industrial AI in America," 2025, doi: 10.2139/ssrn.5036270.

[4] H. Akter, W. Ahmed, I. Sentosa, S. M. Hizam, F. H. Sharin, and I. Mina, "Building a Better Future Workforce: Digital Dexterity and Psychological Empowerment," in *2023 3rd International Conference on Computing and Information Technology (ICCIT)*, IEEE, Sep. 2023, pp. 626–632. doi: 10.1109/ICCIT58132.2023.10273912.

[5] E. Kromidha and N. K. Bachtiar, "Developing entrepreneurial resilience from uncertainty as usual: a learning theory approach on readiness, response and opportunity," *International Journal of Entrepreneurial Behaviour and Research*, vol. 30, no. 4, pp. 1001–1022, Apr. 2024, doi: 10.1108/IJEBR-11-2022-1025.

[6] M. Pinski, T. Hofmann, and A. Benlian, "AI Literacy for the top management: An upper echelons perspective on corporate AI orientation and implementation ability," *Electronic Markets*, vol. 34, no. 1, Dec. 2024, doi: 10.1007/s12525-024-00707-1.

[7] M. Cubric, "Drivers, barriers and social considerations for AI adoption in business and management: A tertiary study," *Technol Soc*, vol. 62, Aug. 2020, doi: 10.1016/j.techsoc.2020.101257.

[8] Y. K. Dwivedi *et al.*, "Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy," *Int J Inf Manage*, vol. 57, p. 101994, Apr. 2021, doi: 10.1016/j.ijinfomgt.2019.08.002.

[9] J. Baker, "The Technology–Organization–Environment Framework," 2012, pp. 231–245. doi: 10.1007/978-1-4419-6108-2_12.

[10] J. Schwaeke, A. Peters, D. K. Kanbach, S. Kraus, and P. Jones, "The new normal: The status quo of AI adoption in SMEs," *Journal of Small Business Management*, vol. 63, no. 3, pp. 1297–1331, May 2025, doi: 10.1080/00472778.2024.2379999.

[11] D. J. Teece, "Business models and dynamic capabilities," *Long Range Plann*, vol. 51, no. 1, pp. 40–49, Feb. 2018, doi: 10.1016/j.lrp.2017.06.007.

[12] G. Mahmood, A. Ditta, M. Ramzan, and Z. Abbas, "Role of Artificial Intelligence (AI) Adoption and Digital Transformation in Enhancing Sustainable Business Performance: The Mediating Effect of Green Product Innovation," *Journal of Accounting and Finance in Emerging Economies*, vol. 10, no. 4, Dec. 2024, doi: 10.26710/jafee.v10i4.3172.

[13] I. Martinez-Conesa, P. Soto-Acosta, and E. G. Carayannis, "On the path towards open innovation: assessing the role of knowledge management capability and environmental dynamism in SMEs," *Journal of Knowledge Management*, vol. 21, no. 3, pp. 553–570, 2017, doi: 10.1108/JKM-09-2016-0403.

[14] O. A. Alghamdi and G. Agag, "Boosting Innovation Performance through Big Data Analytics Powered by Artificial Intelligence Use: An Empirical Exploration of the Role of Strategic Agility and Market Turbulence," *Sustainability (Switzerland)*, vol. 15, no. 19, Oct. 2023, doi: 10.3390/su151914296.

[15] M. N. Alam, J. Iqbal, H. S. Alotaibi, N. T. Nguyen, N. Mat, and A. Alsiehemy, "Does Workplace Spirituality Foster Employee Ambidexterity? Evidence from IT Employees," *Sustainability (Switzerland)*, vol. 15, no. 14, 2023, doi: 10.3390/su151411190.

[16] B. Kump, A. Engelmann, A. Kessler, and C. Schweiger, "Toward a dynamic capabilities scale: Measuring organizational sensing, seizing, and transforming capacities," *Industrial and Corporate Change*, vol. 28, no. 5, pp. 1149–1172, 2019, doi: 10.1093/icc/dty054.

[17] M. Palade and G. Carutasu, "'Organizational Readiness for Artificial Intelligence Adoption,'" *Scientific Bulletin of the Politehnica University of Timişoara Transactions on Engineering and Management*, vol. 7, no. 1–2, pp. 30–35, May 2023, doi: 10.59168/FDMS6321.

[18] M. Almalki, M. A. Alkhamis, F. M. Khairallah, and M.-A. Choukou, "Perceived artificial intelligence readiness in medical and health sciences education: a survey study of students in Saudi Arabia," *BMC Med Educ*, vol. 25, no. 1, p. 439, Mar. 2025, doi: 10.1186/s12909-025-06995-1.

[19] S. J. Marsh and G. N. Stock, "Creating dynamic capability: The role of intertemporal integration, knowledge retention, and interpretation," *Journal of Product Innovation Management*, vol. 23, no. 5, pp. 422–436, 2006, doi: 10.1111/j.1540-5885.2006.00214.x.

[20] R. Primahendra, J. T. Purba, G. S. S. Ugut, and S. Budiono, "The Influence of Transformative Learning, Affective Commitment, Digital Transformation, Capability Dynamic, Ambidexterity, and Education Policy Toward Educational Leadership: A Case from Indonesia," *Revista de Gestão Social e Ambiental*, vol. 18, no. 8, p. e05979, 2024, [Online]. Available: https://rgsa.emnuvens.com.br/rgsa/article/view/5979

[21] A. Martins, "Dynamic capabilities and SME performance in the COVID-19 era: the moderating effect of digitalization," *Asia-Pacific Journal of Business Administration*, vol. 15, no. 2, pp. 188–202, 2023, doi: 10.1108/APJBA-08-2021-0370.

[22] X. Zhang, Z. Wang, W. Luo, F. Guo, and P. Wang, "How Digital Orientation Affects Innovation Performance? Exploring the Role of Digital Capabilities and Environmental Dynamism," *Systems*, vol. 13, no. 5, May 2025, doi: 10.3390/systems13050346.

[23] M. H. Al Dhaheri, S. Z. Ahmad, and A. Papastathopoulos, "Do environmental turbulence, dynamic capabilities, and artificial intelligence force SMEs to be innovative?," *Journal of Innovation and Knowledge*, vol. 9, no. 3, Jul. 2024, doi: 10.1016/j.jik.2024.100528.

[24] S. Gyedu, T. Heng, M. V. Menyah, and J. Oti-Frimpong, "The Moderating Effect of Environmental Turbulence on the Relationship Between Customer Relationship Management and Business Performance," *Int J Sci Res Sci Technol*, pp. 87–105, Mar. 2021, doi: 10.32628/ijsrset218218.

[25] S. A. Zahra, W. Liu, and S. Si, "How digital technology promotes entrepreneurship in ecosystems," *Technovation*, vol. 119, 2023.