مجلة الأصيل للبحوث الاقتصادية والإدارية
El - Acil Journal for Economic and Administrative Research
ISSN: 2571-9866
EISSN: 2661-7854
Volume:10 / N°2/October 2026, PP 114-132

Dynamic Capabilities and Innovation Performance in Resource-Constrained SMEs: Evidence from Algerian Enterprises

القدرات الديناميكية والأداء الابتكاري في المؤسسات الصغيرة والمتوسطة محدودة الموارد: دليل من المؤسسات الجزائرية

***GASMALLAH Noureddine**
University of Constantine 2, Algeria
gasmallahedi@gmail.com

BOUACHA Mebarek
University of Constantine 2, Algeria
bouacha@univ-constantine2.dz

Received:18/05/2026 *Accepted:26/10/2026* *Published: 31/10/2026*

Abstract:
In Algerian SMEs and startups, internal organizational capacities affect technical innovation performance and development. Based on dynamic capacities and knowledge-based viewpoints, it claims that innovation-supportive culture, administrative innovation, and personalized support measures turn technological adoption into competitive advantage and economic success. The paper predicts a capacities cascade among these constructs using a quantitative cross-sectional survey of 376 SMEs with reliability and validity testing. Support strategies, administrative innovation, and innovation-supportive culture greatly affect technical innovation adoption, which improves performance and ties SMEs and startups to economic growth through a culture→ administration→ technology→ performance→ growth pathway.

Key words: Technological innovation adoption, Dynamic capabilities, Organizational performance, Algerian SMEs and startups.

JEL classification codes: O31, O32, L25, L26, O55

**Corresponding author*

1. Introduction.

The competitive landscape has altered due to accelerated digital disruption and Industry 4.0 and businesses need to rethink strategy, operations and governance to be competitive(Verhoef, 2021; Cardoso, 2025). This strain is particularly felt by SMEs, who are important actors in the national economies, but are usually characterized by limited resources, inadequate institutional support, and fierce market competition(Arslan, 2024; Cucculelli, 2025). Shortages of human resources, institutional gaps and inherited industrial systems in emerging and transition nations also limit innovation (Arbeláez, 2023). Algeria is one such example. Public frameworks such as ANVREDET and INAPI show ambition to innovate yet innovation output at the business level is still limited. Many Algerian SMEs are confined to technical consumption rather than knowledge production, as a result of unpredictable macroeconomic conditions, weak risk capital and structural.

The study conceptualizes technological innovation (TI) in terms of the Dynamic Capabilities Theory (DCT) and the Knowledge-Based View (KBV). In terms of the dynamic capacities, enterprises need to recognize technology opportunities, grab them by using organizational and cultural resources, and adapt routines to respond to changing market conditions(Teece D. J., 2007; Teece D. J., 2024; Eisenhardt, 2017). For Algerian SMEs, these processes are not only about the acquisition of digital instruments. They are based on absorptive capacity, organizational learning and administrative innovation(Lawson, 2001; Zahra, 2002). The KBVreinforces this perspective by focusing on knowledge as a core strategic resource rather than a secondary input(Grant, 1996). Where strategic foresight, specialized skills and financial resources are lacking, knowledge inertia hinders the growth of technical capabilities(Yu, 2017). Innovation maturity hence demands flexible cultures, adaptable governance, risk tolerance and managerial mechanisms that promote ongoing.

The broader literature on innovation has shifted away from linear stage-gate models to interactive and system methods. The Science, Technology and Innovation (STI) style is based on formal R&D and codified scientific and technical knowledge, whereas the Doing, Using and Interacting (DUI) mode stresses learning by experience

and user-producer contact(Jensen, 2007). Later data demonstrates that organizations using both approaches get better innovation results(Rousseau, 2016). Studies also emphasize the importance of investment in equipment, collaboration between enterprises, diversity in the workforce, worldwide knowledge flows and interactive learning as drivers of innovation(Solheim, 2022).

Existing Arab and Algerian research suggests that technological and intellectual assets improve performance only when embedded in purposeful organizational and governance frameworks(Al Omari, 2021; Zahra, 2002). Without these models, imported technologies risk reinforcing dependency rather than building local capability. Algerian innovation studies remain fragmented, with greater attention to financial and technical obstacles than to the organizational and cultural micro-foundations of innovation (Büschgens, 2013; Gibson, 2004). Research also shows that entrepreneurial orientation and competitive pressure support innovation, while collateral-based finance, weak university-industry linkages, and technological dependency constrain it(Ait Atmane, 2022; Lachachi, 2017; Al Bermani, 2024).Against this background, the study deals with three gaps: the absence of an integrated STI-DUI model for the Algerian SMEs, the presence of a theory-practice split, and the existence of transaction-cost explanations that underestimate culture, administration and organizational design. It thus examines the impact of administrative innovation, organizational culture and technical innovation initiatives on adoption, business performance and contribution to economic growth.

The study suggests three hypotheses: Administrative and organizational innovation have a positive impact on technological adoption; performance obtained through TI strategies contributes to economic growth; and adaptive, learning-oriented, risk-acceptant culture promotes innovation by fostering exploration and exploitation(March, 1991; Gibson, 2004; Aftab, 2023; Hassani, 2026).The study contributes theoretically by integrating the culture-innovation relationship into Algerian SME research and by positioning administrative and TI as complementary assets in resource-constrained contexts(Birkinshaw, 2008; Volberda, 2014; Teece D. J., 2024). Practically, it offers SME managers a diagnostic

basis for identifying organizational bottlenecks and designing culture-sensitive innovation roadmaps. It also provides policymakers with guidance for linking technology finance to organizational development, university-industry collaboration, and human capital formation(Cardoso, 2025; Odesola, 2026). From a methodological standpoint, the study employs a combined deductive and inductive approach in order to increase its applicability to similar emerging economies.

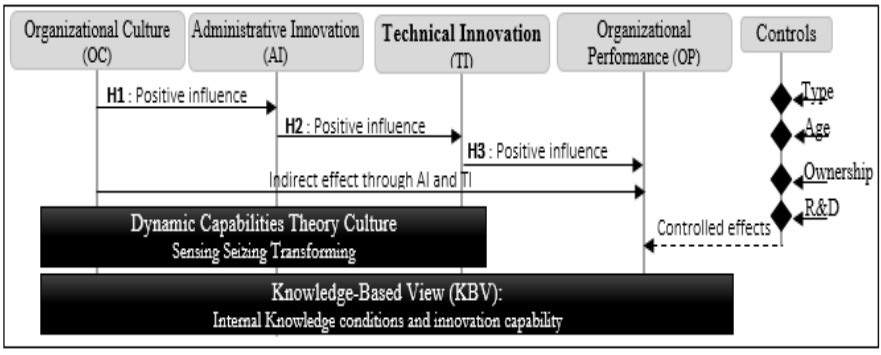
The remainder of this paper is organized as follows. Section 2 develops the conceptual framework and reviews the theoretical foundations linking organizational culture (OC), administrative innovation (AI), and technological capability. The third details the research methodology, including sampling procedures and analytical techniques. The fourth presents empirical results, while the final section discusses findings, implications, exhibit limitations, and highlights directions for future research.

2. Theoretical Framework and Hypotheses.

2.1. Conceptual Model.

This study develops a model (fig 1.) that explains the influence of internal factors on inbound open innovation and performance based on DCT and KBV.

Fig 1. Framework of the proposed sequential mediation model.



Source: Authors'conceptualization.

Organizational culture influences administrative innovation that leads to technical innovation (inbound open innovation), and therefore improves organizational performance following DCT's "sensing–seizing–transforming" logic(Teece D. J., 2007). Controls include type, age, industry, ownership and R&D.

2.1. Hypotheses Development and Theoretical anchoring.

According to the Competing Values Framework and organizational learning theory, organizational culture (OC) is the shared values, beliefs, and conventions that impact how members approach and handle organizational challenges. This study explores a flexible, developmental culture that encourages continuous learning, employee initiative, risk tolerance, and adaptation to minimize experimental costs and psychological safety for knowledge exploration.Administrative innovation (AI) improves organizational effectiveness by introducing new methods, structures, and governance(Birkinshaw, 2008; Volberda, 2014). It is an architectural competence that reconfigures internal processes to assimilate external knowledge and entails changes in decision-making, communication systems, authority allocation, and coordination, unlike technology innovation.TI is the company adoption and use of advanced technologies, processes and products(Arslan, 2024). In order to absorb external information and shift from technology acquisition to technical capability building, the study stresses inbound open innovation, which involves licensing, joint R&D, technology purchasing, and collaborations.Organizational performance (OP) is how well a company meets its economic and strategic goals in operational efficiency, market competitiveness, and economic growth. According to the KBV, organizational capabilities drive performance, which improves product quality, cost efficiency, delivery speed, and competitive positioning for SMEs(Odesola, 2026).

2.1. Hypotheses Development

a.**H1:Flexible Organization Culture positively influences Administrative Innovation *(OC→AI)***-Flexible, learning-oriented, risk-tolerant cultures are the behavioral and cognitive basis for administrative change and belong to the strongest determinants of innovation adoption(Büschgens, 2013; Yu, 2017). Such cultures "sense" environmental changes and are tacit, inimitable resources

that allow real administrative modernization from DCT and KBV perspectives, especially in hierarchical, risk-averse Algerian SMEs (Barney, 1991; Teece D. J., 2007).

b.**H2:Administrative Innovation positively influences Technological Innovation*(AI→TI)*-** argues that AI and TI are complementary, especially in emerging economies where this link is under-tested.Administrative innovation enhances the absorptive capacity by restructuring internal procedures to improve firms' ability to recognize, assimilate and utilize external knowledge(Damanpour, 2010; Birkinshaw, 2008; Zahra, 2002). According to the Dynamic Capabilities Theory, administrative innovation is the seizing capability. Flexible culture detects opportunities, while new governance structures and decision protocols decrease coordination costs, avoid "Not-Invented-Here" resistance and encourage cross-functional collaboration, which supports deeper technology integration and higher returns on technology investments, especially in capacity-constrained Algerian SMEs(Bloom, 2019; Yu, 2017).

c.**H3:Technological Innovation positively influences Organizational Performance (TI→OP)-**Technological Innovation, especially inbound open innovation, is expected to improve OP, but its effects depend on context and complementary capabilities(Brynjolfsson, 1998).It creates advantage when information is precious, rare, inimitable and non-substitutable, and enhances quality, efficiency and responsiveness, but produces high returns only when supported by a supportive culture and administrative innovation, especially in Algerian SMEs.Thus, H3 tests not merely the direct effect of technology, but the conditional performance impact when technological adoption is supported by internal organizational enablers.

d. **H4:**Mediating Role of Administrative Innovation, **AI acts as mediator between OC and TI, in turn, TI mediates AI and OP, thus forming a sequential mediation chain *(OC→AI→TI →OP)*-** H4 integrates H1–H3 into a sequential mediation model explaining how organizational culture ultimately drives performance, thereby opening the culture–performance "black box" by tracing culture's distal effects to operational outcomes.Methodologically, H4 treats AI and TI as transmission mechanisms, not just correlated outcomes, implying that effective cultural interventions must first reconfigure administrative systems, with technology adoption as a subsequent milestone; bypassing administrative reform renders cultural efforts on technology ineffective(Ait Atmane, 2022; Lachachi, 2017).In Algeria, where innovation policies prioritize financial incentives for technology acquisition while neglecting organizational development, H4 would justify reordering policy priorities: building cultural and administrative capabilities as prerequisites and treating technological investment as the culmination of this capability cascade.

3. Methodology.

3.1. Research design.

To examine how organizational factors drive the adoption of technological innovation (TI) and how this, in turn, affects performance in Algerian SMEs and start-ups, the study employs a quantitative, cross-sectional survey design. Because it enables calculation of statistical correlations among theoretically stated constructs assessed at a single moment in time, this approach satisfies the aimed purpose. The study analyses TI adoption as the result of more general organizational conditions, such as organizational and administrative innovation, innovation-supportive organizational culture, and TI support strategies. It then looks at how these conditions relate to organizational performance and economic growth. There are two good reasons to utilize a structured questionnaire. First, non-observable managerial attitudes, organizational practices, and strategic orientations are referred to as the core variables.

3.2. Population, sampling and data collection.

The empirical context is that of Algerian SME for which TI is a strategic issue, but which are constrained by organizational, financial and institutional restrictions. Purposive sampling was applied to identify organizations that have relevant exposure to innovation-related issues and opportunities. Out of 400 questionnaires given, 376 acceptable replies were kept after incomplete, inconsistent or ineligible instances were removed, giving a usable responseof 94%. Respondents held positions that would be expected to provide informed judgements of strategy, organizational practices, and innovation processes, including executives, managers, unit heads, project leaders, and senior staff. Questionnaire was administered in Arabic for better understanding. It included firm and respondent characteristics, R&D capabilities and budget allocation. Previous review increased clarity and coherence and thematic blocks identified the importance of innovation, organizational conditions, adoption, performance outcomes and contextual impediments.

3.3. Measurement of constructs.

All substantive constructs were operationalized through multi-item Likert-type scales. Participants responded on a five-point scale from 1 to 5 (respectively from “strongly disagree” to “strongly agree”). The questionnaire contained eight substantive blocks: perceived importance of TI, administrative and organizational innovation, innovation-supportive organizational culture, technological innovation support strategies, organizational performance, technological innovation adoption, contribution to economic growth, and barriers to innovation. The first seven blocks represent the main theoretical variables of the study, whereas the barriers section serves as a contextual diagnostic block rather than as a core explanatory construct in the main analytical model.

3.4. Data preparation and statistical analysis.

Prior to hypothesis testing, the dataset was evaluated for completeness, internal plausibility, respondent eligibility and analytical applicability, with problematic cases deleted. The analysis was in two stages. Descriptive statistics-including measures of means, standard deviations as well as frequencies and percentages,

were used to summarize the sample characteristics and the distribution of survey responses.Pearson correlations were employed to test bivariate relationships and multiple regression models were utilized to determine the explanatory power of antecedent variables. The scale quality was tested by Cronbach's alpha (α), composite reliability (CR), average variance extracted (AVE), and tests of discriminant validity.

4. Results.

This section reports empirical results for 376 Algerian SMEs and startups, covering descriptive, measurement validation, and structural tests of hypotheses.

4.1. Sample profile and descriptive Statistics.

The final analytical sample comprises 376 valid responses, representing a 94% acceptance rate from an initial distribution of 400 questionnaires. The final distribution of the sample across firm-size categories was as follows: 138 small (36.7%), 147 medium(39.1%), and 91 startups (23.9%).Sectoral coverage includes services and information technology (20.5%), trade and distribution (19.7%), manufacturing (19.4%), financial services (9.3%), health and pharmaceuticals (7.4%), tourism and hospitality (7.2%), and agriculture and food industries (6.1%). The majority of respondent firms are privately owned (80.9%), with smaller proportions under public (11.2%) or foreign private (8.0%) ownership.Most of the respondents are in strategic or operational power positions:department managers (20%), unit heads (21%), project or team leaders (18%) and senior staff (>25%). The majority are aged 30 to 49 (57.7%) and are post-secondary qualified (>67%). This profile enhances data quality since respondents are sufficiently experienced and knowledgeable to evaluate innovative practices and performance.

TI was rated above the neutral midpoint (3.0 on the five-point scale) in perceived importance, with means ranging from 3.2 to 4.1. Respondents saw innovation as the key to overcoming economic issues, enhancing competitiveness, cutting costs and strengthening resilience. This shows that managerial awareness of innovation is a basis for adoption behavior.

Administrative and organizational innovation. The highest-rated items in this dimension concerned organizational flexibility and employee participation in decision-making. Means for flexibility-related items exceeded those for modern management practices (e.g., data-driven management, total quality management), suggesting that while firms value structural adaptability, the institutionalization of advanced managerial routines remains uneven.Innovation-supporting culture means: constant learning, knowledge exchange, constructive error treatment, initiative and external openness. It influences how people perceive change, handle risk, and engage in creativity in internal innovation processes. backing strategies are the strongest perceived antecedent, combining material readiness with managerial commitment to adoption success, as indicated by high scores for R&D investment, top management backing, technology infrastructure, and innovation planning.

Operational performance measures (productivity, service quality, stakeholder satisfaction) have outperformed financial and market indicators, indicating that changes in internal processes lead to wider competitive and financial performance advantages over time in organizations. While companies report frequent product, service and process innovation, big data and artificial intelligence are still less mature, showing a tendency to select technologies that have more immediate operational value and require less intensive integration.

Innovation mainly contributes through employment creation and value addition followed by technology transfer and sustainability. This has a developmental perspective connecting business level innovation with productive activity and less import dependence. Some of the major challenges include financial limits, skills shortages, bureaucracy, employee resistance and insufficient infrastructure. These are mutually reinforcing barriers, restricting the growth of capability, the readiness of technology and the realization of persistent innovation.

4.2. Measurement model Assessment

Reliability and convergent validities Table 1 shows αCronbach, composite reliability (CR), and average variance extracted (AVE) for each construct. Cronbach's alpha coefficients range from 0.867 to 0.901, higher than the minimum standard of 0.70 generally

acknowledged. The composite reliability scores ranged from 0.884 to 0.913, which also supported the internal consistency of the measurement scales. In addition, the AVE range from 0.509 to 0.585, which exceed the acceptable criteria of 0.50(Fornell, 1981). These data indicate sufficient convergent validity.

Table 1.Reliability and convergent validity.

Dimension	items	α	CR	AVE
Administrative Innovation (AI)	20	0.892	0.899	0.532
Innovation-Supportive Culture	25	0.875	0.883	0.521
Innovation Support Strategies	15	0.867	0.876	0.509
Technological Performance	20	0.884	0.891	0.545
Organizational Performance (OP)	20	0.901	0.907	0.585
Economic growth Contribution	20	0.878	0.885	0.538
Overall	**141**	**0.913**	-	-

Note: All constructs meet recommended thresholds (α > 0.70, CR > 0.70, AVE > 0.50).

Source: Authors' compilation based on questionnaire responses.

The discriminant validity was established based on the (Fornell, 1981) criterion where the square root of the AVE of each construct was greater that its correlations with other constructs indicating the empirical distinctiveness. Considering the self-reported and cross-sectional design of the study, Harman's single-factor test was used to screen for common method bias. The first factor accounted for 28.4% of the overall variation, which is less than the 50% requirement and suggests no serious danger to validity.Correlation analysis (Table 2) revealed positive correlations between all constructsat $p < 0.001$. The adoption of TI was strongly associated with the adoption of AI ($r = 0.551$), innovation supportive culture($r = 0.516$) and support strategies ($r = 0.551$). OP correlates positively with TI adoption ($r = 0.491$), and economic growth contribution correlates positively with both TI adoption ($r = 0.474$) and OP ($r = 0.593$).

Table 2. Bivariate correlations.

Construct	1	2	3	4	5
Administrative Innovation	1.000				
Innovation-Supportive Culture	0.672	1.000			
Innovation Support Strategies	0.703	0.688	1.000		
Technological Innovation Adoption	0.551	0.516	0.551	1.000	

Organizational Performance (OP)	0.489	0.476	0.503	0.491	1.000
Economic growth Contribution	0.478	0.452	0.452	0.474	0.593

Note: N=376. P < 0.001 **Source:**Authors' calculations.

Multiple regression analysis. Hierarchical multi-regression was employed in order to test hypotheses. Model 1 regressed TI adoption on the three antecedent constructs (AI, innovation-supportive culture, support strategies). Model 2 regressed OP on TI adoption. Model 3 regressed economic growth contribution on both TI adoption and OP. Variance inflation factors (VIF) remained below 3.5 in all models, confirming the absence of multicollinearity.

Hypothesis 1 (H1) proposed that administrative and organizational innovation, innovation-supportive culture, and support strategies positively influence TI adoption.

Table 3. Multiple Regression: Antecedents of TI Adoption.

Predictor	Unstd. β	Std. β	t	P	VIF
Administrative Innovation	0.300	0.300	6.73	< 0.001	2.84
Innovation-Supportive Culture	0.209	0.209	4.91	< 0.001	2.57
Innovation Support Strategies	0.320	0.320	7.56	< 0.001	2.62

Note: $R^2 = 0.464$; Adjusted $R^2 = 0.460$; $F(3, 372) = 107.46$, $p < 0.001$.

Source: Authors' estimates based on survey data.

Table 3 shows that all three antecedents exert positive and statistically significant effects.Support strategies exhibit the strongest coefficient ($\beta = 0.320$, $t = 7.56$, $p < 0.001$), followed by administrative innovation ($\beta = 0.300$, $t = 6.73$, $p < 0.001$) and innovation-supportive culture ($\beta = 0.209$, $t = 4.91$, $p < 0.001$). The model explains 46.4% of the variance in IT adoption ($R^2 = 0.464$, $F = 107.46$, $p < 0.001$). ***H1** is fully supported.*

Hypothesis 2 (H2) proposed that TI adoption positively influences organizational performance (OP), and that OP positively influences economic growth contribution. Table 4 reports the results. TI adoption exhibits a positive effect on OP ($\beta = 0.260$, $t = 5.23$, $p < 0.001$). When both TI adoption and OP are entered as predictors of economic growth contribution, OP demonstrates the stronger effect ($\beta = 0.484$, $t = 10.26$, $p < 0.001$), while TI adoption retains a significant but smaller effect ($\beta = 0.260$, $t = 5.23$, $p < 0.001$). The model explains 39.6% of the variance in economic growth

contribution (R^2 = 0.396, F = 122.07, p < 0.001). **H2***is fully supported.*

Table 4. Multiple Regression: Performance and Economic Growth.

Dependent Variable	Predictor	Std. β	t	p	R^2
Org. Performance (OP)	TI.Adoption	0.260	5.23	<0.001	0.241
Eco. Growth Contribution	TI.Adoption	0.260	5.23	<0.001	0.396
	O.P	0.484	10.26	<0.001	

Source: Authors' calculations.

Hypothesis 3 (H3) proposed that flexible organizational culture positively influences innovation levels. The results in Table 4 confirm that innovation-supportive culture exerts a significant effect on TI adoption (β = 0.209, p < 0.001). Moreover, the bivariate correlation between culture and TI adoption (r = 0.516, p < 0.001) provides additional support. **H3** *is fully supported.*

5. Discussion

This section presents empirical findings on the adoption of TI by Algerian SMEs and startups. The results reveal that the outcomes of the adopted TI are affected by administrative and organizational innovation, innovation-supportive culture and technical support systems. TI is organizational configuration of managerial flexibility, cultural preparedness, strategic commitment, resources and institutional support that generates performance, employment, value, transfer and sustainability benefits, not a technical decision.

5.1 Perceived Importance of Technology Innovation.

Overall, respondents' perceptions of TI were positive, with all items above the midpoint of the scale. They saw TI as a strategic need to respond to economic challenges, increase competitiveness, reduce operating costs and enhance resilience. Moderate answer dispersion reflects broad managerial consensus, which implies that innovation awareness is ingrained in corporate cognition and constitutes a fundamental precondition for technology adoption.

5.2 Administrative (AI) and Organizational Innovation (OI)

The results point out that administrative and organizational innovation are requirements for technological preparation. The respondents rated organizational flexibility, inter-departmental collaboration, employee participation and current management

approaches as very important. The most approved were flexibility and participation, showing its importance for the integration of technology. Data-driven management, quality management and performance evaluation were scored well. However, the lower averages indicate uneven institutionalization among firms.

5.3 Innovations in Organizational Culture.

Organizational culture is a key factor of innovation. Respondents advocate continuous learning, sharing of information, positive management of mistakes, initiative and openness to the external environment. These conditions justify the need for experimentation and search for new solutions, minimize opposition and increase readiness for change. For SMEs with financial constraints, culture is a pragmatic organizational strategy influencing employees' perceptions of technological advancement, risk and innovation uptake.

5.4. Supporting TI.

We found that there exist technological innovation support measures preceding the adoption. The respondents assessed R&D funding, senior management support, infrastructure and strategic innovation planning as very high, particularly for current technologies and material readiness. The results show that successful adoption takes resources, infrastructure, and leadership buy-in to make intent a reality. Investment in R&D improves the internal knowledge creation and adaptability, which effectively reduces the over-reliance on external technology with the passage of time.

5.5 Organizational performance.

Organizational performance was graded positively, especially in operational quality, productivity, service quality, and stakeholder satisfaction. Financial and market results were similarly positive, though somewhat lower than operational indicators. The pattern shows that the benefits of innovation are first translated into internal processes and responsiveness, and then into strategic value. Efficiency, quality, responsiveness and satisfaction show up as performance characteristics that reinforce one other.

5.6. TI Adoption.

The sample firms are already involved in TI across products, services, processes, marketing and technology acquisition. The respondents reported on new products, modern technologies,

operational improvement and digital marketing via platforms and customer data analysis. Big data and artificial intelligence are getting lower scores, reflecting uneven digital maturity – with companies favoring technologies that deliver direct operational benefits over those that require specialized skills and data infrastructure.

5.7 Contribution to Economic Growth

Respondents think that technical innovation contributes to economic growth through creation of jobs, value added, transfer of technology and sustainability. Innovation is thus introduced as an internal efficiency mechanism and a development instrument of SMEs and startups in Algeria. High scores on employment and value creation reflect perceived advances in productivity, less dependence on technology, and greater ties between innovation and accountability.

5.8 Barriers to Innovation

The barriers analysis shows that the main problems for innovation adoption are budget constraints, lack of skills, bureaucracy, employee animosity and inadequate infrastructure. The constraints are mutually reinforcing and limit capacity for training, R&D and implementation. Unequal access to government funds and foreign collaboration also means that policies are not taken up evenly, which emphasizes the necessity for systemic intervention rather than piecemeal corrective initiatives.

5.9 Model Validation and Implications of TI Adoption.

The empirical findings are consistent with the proposed conceptual model by confirming the positive relationships between AI and OI, innovation-supportive culture, TI support strategies, TI adoption, organizational performance, and contribution to economic growth. The correlation and regression studies show that internal preparation is not driven by one element, but rather is the result of the combined influence of structural adaptation, cultural preparedness, managerial commitment, resource availability, infrastructure and strategic innovation planning. Of these factors, support methods were the biggest predictor of TI adoption, emphasizing the relevance of operational and resource-based readiness. The findings also add credence to the expected sequence whereby TI adoption improves organizational performance, which in turn helps firms' broader contribution to economic growth. Theoretically, the research conceptualizes TI as a multidimensional organizational phenomenon

rather than just a technical investment. Operationally, it means that SMEs and startups need dedicated implementation mechanisms, such as management training, R&D support, simpler administrative procedures, greater technological infrastructure and collaboration with universities, research centers and technology companies.

6. Conclusion.

This paper claims that the technical innovation of Algerian SMEs and startups is not so much about the purchase of technology, but about organizational capacity to adapt and create value. The study conceptualizes innovation-supportive culture, administrative innovation and innovation support strategies as key antecedents of technological innovation adoption, organizational performance and contribution to economic growth drawing on the DCT and KB.The results indicate that the administrative innovation, organizational culture, and innovation support strategies positively and significantly influence the adoption of technical innovation. The support strategies are the biggest predictors followed by administrative innovation and culture. Together these characteristics accounted for 46.4% of the variance in adoption. Technological innovation adoption enhances organizational performance, which is the most significant driver to economic growth. This indicates a capacity cascade, whereby cultural and administrative capabilities assist technology uptake, technology uptake improves performance and enhanced performance supports job development, value creation, technology transfer, sustainability and economic diversification.In addition, descriptive evidence shows great awareness of technological innovation, learning-oriented culture, organizational agility and innovation support. However, the diffusion of big data and artificial intelligence remains limited, showing that Algerian SMEs and start-ups are more prepared to implement operational technology than advanced digital applications that require specialized expertise, better infrastructure and deeper organizational integration.

The study contributes to the literature by conceptualizing organizational capacities as antecedents of innovation, performance and development outcomes with a reliable and valid multidimensional measurement instrument for SMEs and startups in an emerging country. However, the cross-sectional, single-informant

self-reported methodology limits the inference of causality and generalizability. In fact, the sample, of 376 organizations,is selective and therefore limits the generalizability and may favor creative enterprises. Although the reliability and common method bias test were conducted, the self-reported Likert scale may still be subject to social desirability and shared-method bias. Future research should examine how R&D investment, digital infrastructure, leadership commitment, AI, big data, and digital capabilities affect the innovation-performance-growth nexus in Algeria and other emerging economies using longitudinal, multi-source, and comparative designs and archival and qualitative data.

7. Bibliography

Aftab, J. S. (2023). Organizational ambidexterity & digital transformation in SMEs: Systematic literature review. *Sustainability, 15(5)*, 4111.

Ait Atmane, A. (2022). Stratégie d'innovation dans l'entreprise algérienne (wilaya de Bejaia). *Revue Organisation et Travail,10(4)*, 259-277.

Al Bermani, A. M.-S. (2024). The Role of Industrial Intellectual Property Rights in Supporting Small and Medium Enterprises in Arab Countries. *AgBioForum, 26(2)*, 77-85.

Al Omari, R. (2021). The impact of capital structure on Jordanian banks performance. *Social Sciences J. (COES&RJ-JSS), 10(1)*, 35-47.

Arbeláez, J. &. (2023). Institutional voids and innovation in developing countries. *Journal of International Development, 35(2)*, 1–17.

Arslan, M. I. (2024). Effects of standardized innovation management systems on innovation ambidexterity and innovation performance. *Sustainability, 17(1)*, 116.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17(1)*, 99–120.

Birkinshaw, J. H. (2008). Management innovation. *Academy of Management Review, 33(4)*, 825–845.

Bloom, N. B.-E. (2019). What drives differences in management practices? *American Economic Review, 109(5)*, 1648–1683.

Brynjolfsson, E. &. (1998). Beyond the productivity paradox. *Communications of the ACM, 41(8)*, 49-55.

Büschgens, T. B. (2013). Organizational culture and innovation: A meta-analytic review. *Journal of Product Innovation Management, 30(4)*, 763–781.

Cardoso, J. D. (2025). Industry 4.0 and Its Relationship with Digital Transformation: A Systematic Literature Review 2019-2024. *Revista de Administração da UFSM, 18(4)*, e5.

Cucculelli, M. L. (2025). Firm adoption of Industry 4.0 technologies in times of economic turmoil: the role of enabling factors. *Journal of Technology Transfer*, 1-31.

Damanpour, F. (2010). An integration of research findings of effects of firm size and market competition on product and process innovations. *British Journal of Management, 21(4)*, 996–1010.

Eisenhardt, K. M. (2017). Dynamic capabilities: what are they? *The SMS Blackwell handbook of organizational capabilities*, 341-363.

Fornell, C. &. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18(1)*, 39-50.

Gibson, C. B. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal, 47(2)*, 209–226.

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17(S2)*, 109–122.

Hassani, A. &. (2026). Responsible digital transformation and sustainable performance: role of organisational ambidexterity. *International Journal of Organizational Analysis*, 1-19.

Jensen, M. B. (2007). Forms of knowledge and modes of innovation. *Research Policy, 36(5)*, 680–693.

Lachachi, W. T. (2017). Préparation de la PME Algérienne à l'internationalisation. *R.Africaine de Management, 1(2)*, 104-117.

Lawson, B. &. (2001). Developing innovation capability in organisations: A dynamic capabilities approach. *International Journal of Innovation Management, 5(3)*, 377–400.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2(1)*, 71–87.

Odesola, O. T.-A. (2026). Exploring the link between knowledge management practices and operational performance: Empirical evidence from Nigerian SMEs. *Revista Galega de Economía, 35(1)*.

Rousseau, M. M. (2016). Innovation, firm performance and appropriation: A meta-analysis. *I.J. of Innovation Management, 20(3)*, 33-165.

Solheim, M. C. (2022). Making a thousand diverse flowers bloom: Driving innovation through inclusion of diversity in organisations. *In Rethinking the social in innovation and entrepreneurship*, 174-189.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro foundations of (sustainable) enterprise performance. *Strategic Management Journal, 28(13)*, 1319–1350.

Teece, D. J. (2024). Technological decoupling and dynamic capabilities. *California Management Review, 66(2)*, 5–17.

Verhoef, E. C. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.

Volberda, H. W. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies, 35(9)*, 1245–1264.

Yu, C. P. (2017). The effect of organizational learning and knowledge management innovation on SMEs' technological capability. *Eurasia Journal of Mathematics, S.T.E, 13(8)*, 5475–5487.

Zahra, S. A. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27(2)*, 185–203.