



American Journal of Innovation in Science and Engineering (AJISE)

ISSN: 2158-7205 (ONLINE)

VOLUME 5 ISSUE 1 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Dynamic Capabilities and Technological Innovation: A Systematic Review of Strategic Mechanisms for Business Competitiveness

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Article Information

Received: July 12, 2025

Accepted: September 26, 2025

Published: February 09, 2026

Keywords

*Dynamic Capabilities,
Innovation, Organizational
Strategy, Sustainability,
Technological Transformation*

ABSTRACT

The concept of dynamic capabilities has gained centrality in organizational studies, especially in contexts of technological, environmental and institutional transformation. Such capabilities allow organizations to reconfigure their competencies in response to rapid and unpredictable changes in the external environment. In view of the above, this study aims to analyze dynamic capabilities as a strategic vector for organizational innovation, through an integrative literature review. The methodology adopted consisted of an integrative review based on publications indexed between 2020 and 2025 in Google Scholar, with content analysis structured in emerging categories. The results revealed four main categories: innovation in turbulent environments; ambidexterity in the public sector; sustainable entrepreneurship; and reconfiguration of business models. Evidence indicates the centrality of dynamic capabilities across multiple sectors and strategies. It is concluded that dynamic capacities constitute an expanding field, but still marked by conceptual and operational challenges, requiring methodological and intersectoral deepening.

INTRODUCTION

In recent decades, the debate around dynamic capabilities has intensified, especially in the face of scenarios marked by technological disruptions, environmental pressures, and growing demands for continuous innovation. According to Martínez *et al.* (2025), the concept gained theoretical robustness by consolidating itself as an analytical lens capable of explaining the strategic adaptation of organizations in volatile environments. In dialogue with this perspective, Câmara *et al.* (2025) highlight that such capacities are decisive in the articulation between universities, governments and companies, especially in complex entrepreneurial ecosystems such as those in Brazil and the Netherlands. Aristizábal Murillo (2025) argues that strengthening organizational capacities, when linked to a culture of learning and green management of human resources, enhances sustainable performance and promotes innovation sensitive to the environmental context. Thus, the concept of dynamic capabilities emerges as a point of convergence between organizational adaptability, sustainability, and innovation in diverse institutional contexts.

In this sense, this study aims to analyze dynamic capabilities as a strategic vector for organizational innovation, through an integrative literature review.

LITERATURE REVIEW

Dynamic Capabilities: Concepts

Dynamic capabilities emerged as a response to the

limitations of resource-based viewing, which favored rare and inimitable assets as a source of competitive advantage. According to Teece, Pisano and Shuen (1997), such capabilities are the ability of firms to integrate, build and reconfigure internal and external competencies to respond to rapid changes in the environment. According to Eisenhardt and Martin (2000), they should not be seen as fixed resources, but as strategic routines and processes that support organizational adaptation. This initial theoretical framework constituted the basis for understanding competitiveness in unstable and highly dynamic environments.

Authors such as Barney (1991) maintain that competitive advantage is anchored in valuable, rare and difficult to imitate resources, but this reading was stressed by the processual approach of dynamic capacities. According to Peteraf (1993), static resources are not enough to guarantee organizational sustainability, and the development of continuous learning mechanisms is indispensable. This change in perspective shifts the focus from a static logic to a dynamic one, in which the capacity for renewal and adaptation becomes the decisive element. Thus, the classical debates opened space for new, broader interpretations.

Contemporary studies have been updating and complexifying the concept, bringing it to new contexts. Jahanbakhsh (2025) argues that strategic agility in emerging markets depends on the incorporation of flexibility mechanisms supported by data and artificial intelligence.

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In dialogue, Martinez *et al.* (2025) present a systematic review that reveals the heterogeneity in the application of the concept in different sectors, reinforcing both its relevance and the risk of theoretical fragmentation. This recent movement demonstrates the vitality of dynamic capacities, but also highlights methodological challenges for their consolidation.

At the same time, there are criticisms regarding the operationalization of dynamic capabilities. For Putra *et al.* (2025), when applied to people management, the concept faces difficulties related to measurement and empirical consistency, which weakens its practical applicability. This reading converges with Zahra, Sapienza and Davidsson (2006), who already warned about the risk of trivializing the concept if it were used excessively broadly. These counterpoints reveal that, although useful, dynamic capacities need more precise delimitations to avoid dilution of their explanatory power.

The theory has also been expanded beyond the strictly business field. According to Usman (2025), the application of dynamic capacities in universities shows that the sharing of informational resources strengthens institutional resilience in academic cooperation environments. In a complementary way, Mehmood and Aziz (2025) demonstrate that the introduction of feedback practices supported by digital technologies in education can be understood as a process of dynamic reconfiguration. These contributions broaden the theoretical scope, demonstrating that the concept also dialogues with different social and organizational areas.

In summary, the debate reveals that dynamic capacities form a plural and constantly evolving field. While the classics highlight processes of integration and reconfiguration, the contemporary ones move into new territories, such as data management and education. This diversity reinforces the relevance of the concept, but also highlights the need for greater theoretical clarity and methodological rigor. Thus, the literature consolidates the role of dynamic capabilities as a central axis of organizational theory, setting the stage for correlated analyses in specific dimensions that will be explored in later sections.

Technological Innovation: General Aspects

According to Alves *et al.* (2024), innovation is considered a driving force of economic transformation, understood as a process of creating unprecedented solutions that alter organizational and territorial dynamics. This reading broadens the notion of innovation beyond the production of new goods, incorporating changes in processes, methods and institutional structures, evidencing its multidimensional nature. Contemporary models of innovation indicate that the reorganization of socio-technical systems and the response to complex challenges depend on integrated approaches, in which science, society and the environment operate as central agents. In this way, innovation emerges as a vector of transformation capable of articulating growth cycles

and institutional rearrangements (Alves *et al.*, 2024; Nascimento *et al.*, 2025).

According to Delmondes *et al.* (2024), the innovative dynamic is intrinsically relational, marked by the density of collaborative networks and the diversity of institutional arrangements that connect universities, companies, government, and civil society. In dialogue with this view, Miranda *et al.* (2024) and Alves *et al.* (2024) reinforce that innovative processes cannot be understood as linear, but rather as interactive, with constant feedback between actors that enhances solutions and expands the adaptability of ecosystems.

In addition, Nascimento *et al.* (2025) note that the triple, quadruple, and quintuple helix models demonstrate that the integration between universities, the productive sector, society, and the environment enhances the social legitimacy of innovations. This set of contributions demonstrates the relevance of human capital, interinstitutional trust, and environments favorable to experimentation (Delmondes *et al.*, 2024; and Silva and Vilela Júnior, 2024).

According to Miranda *et al.* (2024) and Silva and Vilela Júnior (2024), technological innovation is distinguished by causing ruptures in technoeconomic paradigms, transforming the patterns of production, circulation, and consumption of goods and services.

In this process, the Technological Innovation Centers (NITs) become protagonists by articulating universities and companies around technology transfer, intellectual property and the creation of new science-based businesses. Alves *et al.* (2024) and Silva and Vilela Júnior (2024) underline that such centers strengthen technical and institutional skills, favoring the emergence of disruptive solutions that reconfigure markets. In addition, Nascimento *et al.* (2025) highlight that public development policies, such as tax incentives and specific legislation, are indispensable to ensure the vitality of innovative ecosystems in peripheral and less integrated contexts.

The empirical analysis of the results will allow us to critically understand how the dynamics of innovation, especially technological ones, reverberate in institutional and territorial impacts. This perspective reinforces the importance of articulating the conceptual framework to the practices identified in the scenarios studied, showing how innovation is no longer just an analytical category to materialize in concrete transformations. Thus, the next step is to examine the unfolding of innovative practices, observing the alignment between theoretical foundations and empirical findings.

MATERIALS AND METHODS

The methodology adopted consisted of an integrative literature review, carried out through Google Scholar searches, considering articles published between 2020 and 2025. Descriptors in Portuguese and English related to the expressions dynamic capabilities, organizational innovation, institutional ambidexterity, innovative

business models and strategic sustainability were used. The selection included both classic authors and contemporary contributions, prioritizing methodological rigor, thematic adherence and theoretical relevance. After screening and critical reading, the selected articles were submitted to content analysis, organized into emerging analytical categories, with the objective of triangulating the empirical findings with theoretical foundations, reinforcing the articulation between tradition and conceptual updating.

RESULTS AND DISCUSSION

The analysis of the studies revealed four main categories that articulate dynamic capabilities and organizational innovation in the recent period: (i) innovation in turbulent environments, (ii) ambidexterity and transformation in the public sector, (iii) innovative entrepreneurship and sustainability, and (iv) strategic reconfiguration and business models. Each category brings together authors who analyze different contexts, but who share concerns about the activation of dynamic capabilities as a support for change and innovation. In the following blocks, the findings are discussed in an integrated way, highlighting convergences, counterpoints and complementarities, triangulated with the theoretical references already presented.

Category 1: Innovation in Turbulent Environments

Monteiro *et al.* (2025) demonstrate that organizational innovation in turbulent scenarios necessitates dynamic capabilities that can reconfigure business models in an agile manner. The organizations analyzed were exposed to disruptive external events, such as the pandemic and economic shocks, and reacted with rapid adaptations in their strategic processes. The study highlights the importance of procedural flexibility as the foundation of dynamic capacities in uncertain contexts. The articulation between planning and strategic improvisation appears as a key point in sustaining innovation.

Barbosa (2025), on the other hand, deepens the discussion on innovation in turbulent environments by exploring absorptive capacity as an essential component of dynamic capabilities. The author argues that the anticipation of disruptions involves the ability to process weak signals from the environment and transform them into input for innovation. Unlike Monteiro *et al.* (2025), who emphasize strategic reconfiguration, Barbosa highlights the role of predictive analytics as a mechanism for capturing value. Both converge in situating capabilities as an adaptive response factor, but with different emphases on how to operationalize them.

Category 2: Ambidexterity and Transformation in the Public Sector

Corrêa (2025) investigates how dynamic capacities operate in public institutions under processes of digitalization and innovation. The author shows that ambidexterity — that is, the ability to explore and exploit simultaneously

— is manifested in the articulation between bureaucratic routines and experimentation with digital solutions. This logic of innovative public management reinforces the role of dynamic capacities as an instrument of institutional transition. The study also shows that organizational culture influences the effectiveness of these capabilities, especially in historically rigid structures.

Leite and Oliveira (2024) complement this discussion by analyzing dynamic capacities in public hospitals, with a focus on knowledge management. The authors identify that the combination of organizational learning and absorptive capacity allows for more effective action in the face of critical demands of the health sector.

In dialogue with Corrêa (2025), they reinforce that innovation in the public sector requires the development of adaptive mechanisms that move between stability and change. Knowledge management, in this case, emerges as a catalyst vector of dynamic institutional capacities.

Category 3: Innovative Entrepreneurship and Sustainability

Martins *et al.* (2024) discuss the relationship between dynamic capabilities and sustainable entrepreneurship in small businesses. The authors show that practices such as digitalization and green innovation require organizational flexibility and collaborative networks that sustain the capacity for continuous adaptation. The research shows that, in low-resource environments, the ability to recombine assets becomes central to value creation. This reinforces the view that dynamic capabilities are critical not only to compete, but to survive in changing markets. Silva *et al.* (2023), although in a different context, also explore the role of creativity as a precursor to capability-driven innovation. The study proposes that competitive advantage lies in the ability to transform creative knowledge into applicable solutions, through flexible organizational structures. In line with Martins *et al.* (2024), the authors reinforce the importance of mobilizing intangible assets — such as culture and leadership — to sustain innovative practices. This complementarity suggests that sustainable innovation requires a broad base of cognitive and relational capabilities.

Category 4: Strategic Reconfiguration and Business Models

Azevedo (2025) analyzes the application of dynamic capabilities in companies in the automotive sector, focusing on business models focused on electric mobility. The study shows that the transition to clean technologies requires deep reconfigurations in production processes, supplier networks and internal competence profiles. The author highlights that the integration between technological innovation and interpretive capabilities is decisive for the success of the transformation. This reinforces the idea that reconfiguration is not only technical, but also symbolic and cognitive.

Ospina, Castillo, and Ometto (2025) address the concept of circular ecosystems as an extension of innovative

business models based on dynamic capabilities. The authors show that, when promoting cycles of reuse and industrial symbiosis, companies need to develop interorganizational coordination skills.

In dialogue with Azevedo (2025), the article broadens the scope of dynamic capabilities beyond the firm, addressing its performance in complex and collaborative systems. The complementarity between the studies indicates that the strategic reconfiguration is increasingly connected to systemic logs.

CONCLUSIONS

This study aimed to analyze dynamic capabilities as a strategic vector for organizational innovation, through an integrative literature review. From the articulation between classical theoretical frameworks and recent empirical contributions, we sought to understand how different institutional contexts and organizational sectors mobilize such capacities in response to pressures for innovation, digital transformation, and sustainability. The investigation allowed the identification of analytical categories that express different forms of activation of dynamic capacities, expanding their conceptual scope and revealing theoretical and methodological tensions still in progress. The findings demonstrate that dynamic capabilities operate as a transversal foundation of organizational innovation, whether in environments of high turbulence, or in public institutions and entrepreneurial networks. In the first category, studies reveal that innovation in critical contexts depends on adaptive and absorptive mechanisms that anticipate disruptions and sustain agile reconfigurations. In the public sector, such capacities enable institutional ambidexterity, articulating innovation with regulatory stability. In the field of sustainable entrepreneurship, dynamic capabilities are expressed through collaborative networks and digital technologies, while in innovative business models they operate as articulators of structural transitions, whether intra-organizational or in circular ecosystems. The triangulation with classical and contemporary authors reinforces that the effectiveness of dynamic capacities depends on their rootedness in interpretive, relational and technological practices. Thus, it is concluded that the proposed objective was partially met, as the review allowed not only to map the multiple forms of activation of dynamic capacities, but also to discuss their practical and theoretical implications. Although the literature offers consistent evidence on the strategic role of these capabilities, challenges persist regarding their conceptual delimitation and empirical measurement, especially in non-business sectors. It is therefore recommended to deepen comparative and multi-scale studies that articulate dynamic capabilities with emerging themes such as artificial intelligence, green transition, and inclusive innovation.

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