# ENTREPRENEURIAL ECOSYSTEMS IN BRAZIL: KNOWLEDGE SOURCES, TYPES OF INNOVATION, AND THE DYNAMICS OF THE TRIPLE HELIX

Ronald Jean Degen, Ph.D.
ANEGEPE, São Paulo, Brazil

**ABSTRACT:** This article examines how entrepreneurial ecosystems in Brazil generate innovation through interactions among startups, universities, investors, and institutional actors. Integrating the Triple Helix with entrepreneurial ecosystem theory and evolutionary perspectives, the study analyzes how different knowledge sources underpin innovation in expansion-stage ecosystems. A qualitative multiple-case design was used, based on startups identified in Pequenas Empresas & Grandes Negócios and longitudinally verified for continued growth. The sample covers fintech, healthtech, energy, artificial intelligence, logistics, and sustainability. Findings indicate that innovation is predominantly recombinative, grounded in professional experience, sectoral and regulatory knowledge, and continuous user interaction. Universities contribute mainly through human capital formation, legitimacy, and institutional orchestration rather than direct technology transfer. The article proposes an integrative framework linking knowledge sources, innovation types, and ecosystem dynamics in an emerging-economy context.

***Keywords:*** Entrepreneurial ecosystems. Triple Helix. Knowledge to innovate. startups in Brazil.

## 1. INTRODUCTION

Over the past two decades, entrepreneurial ecosystems have become a central analytical lens for understanding innovation-driven regional and national economic development (Degen, 2025). Unlike traditional approaches that focus on individual firms or linear models of technological change, the entrepreneurial ecosystem perspective emphasizes systemic interaction among entrepreneurs, firms, universities, investors, governments, and supporting institutions. Innovation, from this viewpoint, is not the result of isolated actors or sequential processes, but of dense

networks, shared norms, institutional complementarities, and cumulative learning dynamics.

In emerging economies such as Brazil, the relevance of the entrepreneurial ecosystem approach is particularly pronounced. Brazil combines a large domestic market, internationally recognized public universities, growing pools of entrepreneurial talent, and an expanding venture capital and private equity industry. At the same time, it faces persistent structural challenges, including regulatory complexity, institutional fragmentation, regional inequality, and historically weak links between academic research and industrial innovation. These characteristics make Brazil an analytically rich context for examining how innovation emerges and scales beyond idealized models developed in advanced economies.

Traditional linear models of innovation, often implicit in science and technology policy, assume a direct flow of knowledge from universities to firms through research commercialization, patents, and spin-offs. While such mechanisms are observable in certain sectors and regions, they provide an incomplete explanation of innovation dynamics in most Brazilian entrepreneurial ecosystems. Many of the country's fastest-growing startups are not based on radical scientific breakthroughs, but rather on the creative recombination of existing technologies, business models, regulatory interpretations, and user insights.

This article addresses the following research question:

> **How do Brazilian startups mobilize different sources of knowledge to generate innovation within entrepreneurial ecosystems, and what roles do universities play in these processes?**

By focusing on startups operating in expansion-stage ecosystems, the study seeks to move beyond celebratory narratives of entrepreneurship and toward a more grounded understanding of how knowledge, institutions, and ecosystems interact over time.

The contribution of the article is threefold:

> **First**, it empirically documents the knowledge bases underpinning innovation in Brazilian startups across multiple sectors.
>
> **Second**, it refines the role attributed to universities within the Triple Helix by highlighting indirect and systemic contributions rather than direct technology transfer.

**Third**, it proposes an integrative conceptual framework that links knowledge sources, types of innovation, and ecosystem dynamics in an emerging-economy context, offering insights relevant to scholars, policymakers, and university leaders.

## 2. THEORETICAL FOUNDATIONS

### *2.1. Innovation as Knowledge Recombination*

Innovation has long been conceptualized as a process of recombining existing resources and knowledge in novel ways. In his foundational contribution, Schumpeter (1934) defined innovation not as invention per se, but as the creation of new combinations, including new products, new methods of production, new markets, new sources of supply, and new organizational forms. This perspective places the entrepreneur at the center of economic change and highlights the non-linear and creative nature of innovation.

Evolutionary economics further advances this understanding by emphasizing that innovation is cumulative, path-dependent, and deeply embedded in routines and learning processes rather than driven by equilibrium optimization (Nelson & Winter, 1982). Firms innovate through experimentation, imitation, and incremental improvement, guided by historically shaped capabilities and institutional constraints. From this viewpoint, innovation outcomes cannot be fully explained by R&D investment alone but must be understood as emergent properties of learning trajectories.

A critical distinction in this literature is between tacit and explicit knowledge. Polanyi (1966) famously argued that "we know more than we can tell," underscoring the role of tacit knowledge that is experiential, context-specific, and difficult to codify. In entrepreneurial contexts, tacit knowledge accumulated through professional experience, industry immersion, and repeated interaction with customers and regulators is often more decisive than codified scientific knowledge.

Research on user innovation reinforces this argument by demonstrating that valuable innovative insights frequently originate from users who experience needs ahead of the broader market (von Hippel, 2005). Startups that maintain close interaction with users can continuously adapt their offerings, refine business models, and identify latent demand. In such cases, markets themselves function as knowledge-generating environments.

Taking together, these perspectives suggest that innovation in entrepreneurial ecosystems is predominantly recombinative, drawing on heterogeneous and often non-scientific knowledge sources. This insight is particularly relevant for emerging economies, where structural constraints limit the scale and speed of formal research commercialization.

### *2.2. Dynamic Capabilities and Absorptive Capacity*

While knowledge recombination explains the origins of innovation, it does not fully account for differences in firms' ability to exploit knowledge effectively. The concept of dynamic capabilities addresses this gap by focusing on the organizational processes that enable firms to integrate, build, and reconfigure internal and external competencies in response to changing environments (Teece, Pisano, & Shuen, 1997).

A central element of dynamic capabilities is absorptive capacity, defined as a firm's ability to recognize the value of new external information, assimilate it, and apply it commercially (Cohen & Levinthal, 1990). Absorptive capacity depends not only on formal R&D activities, but also on prior related knowledge, learning routines, and cognitive diversity within teams. In startups, absorptive capacity is often embodied in founding teams rather than formal organizational structures.

Subsequent research has emphasized that absorptive capacity is shaped by both firm-level and contextual factors. Dense networks, shared language, and repeated interaction among ecosystem actors facilitate learning and knowledge spillovers, while fragmented institutional environments impose higher learning and coordination costs (Zahra & George, 2002).

In entrepreneurial ecosystems, dynamic capabilities therefore emerge from the interaction between individual-level experience and ecosystem-level structures. Startups do not innovate in isolation; their capacity to recombine knowledge depends on the accessibility of mentors, investors, universities, and institutional intermediaries embedded in the regional ecosystem.

### *2.3. The Triple Helix in Emerging Economies*

The Triple Helix model conceptualizes innovation as the outcome of interactions among universities, industry, and government (Etzkowitz & Zhou, 2017). In its classical formulation, universities are expected to assume an entrepreneurial role, engaging actively in research commercialization, patenting, and spin-off creation.

However, empirical studies in emerging economies indicate that this model requires contextual adaptation. In countries such as Brazil, public universities often operate under rigid governance structures, face limited incentives for commercialization, and are evaluated primarily on academic outputs rather than entrepreneurial engagement. As a result, direct technology transfer plays a relatively modest role in most entrepreneurial ecosystems (Dosi, Llerena, & Sylos Labini, 2006).

Instead, universities contribute in more indirect but systemic ways.

> **First**, they serve as primary producers of skilled human capital, supplying engineers, managers, health professionals, and data scientists to startups and established firms.
>
> **Second**, they confer legitimacy on emerging sectors and business models, particularly in highly regulated industries such as health, energy, and finance.
>
> **Third**, universities often act as neutral conveners, facilitating dialogue among firms, investors, and public agencies (Etzkowitz, 2008).

This interpretation aligns the Triple Helix with entrepreneurial ecosystem theory, which emphasizes institutional thickness, legitimacy, and coordination over linear knowledge flows. Universities are thus positioned not as isolated engines of innovation, but as embedded actors whose influence operates through ecosystem-level mechanisms.

### *2.4. Entrepreneurial Ecosystems as Evolutionary Systems*

Entrepreneurial ecosystem theory conceptualizes regions as evolving systems characterized by interdependent actors, resources, and institutions (Spigel, 2017). Ecosystems are shaped by cultural norms, social networks, financial capital, human capital, and institutional frameworks that jointly influence entrepreneurial outcomes.

Spigel and Harrison (2018) propose a process-oriented view in which ecosystems evolve through stages of emergence, expansion, and maturity. In the emergence stage, entrepreneurial activity is sparse and networks are weak. In the expansion stage, entrepreneurial density increases, specialized investors emerge, and successful exits generate reinvestment and knowledge recycling. In maturity, ecosystems exhibit self-reinforcing dynamics but may also face risks of lock-in and declining experimentation.

The present study focuses on expansion-stage ecosystems, where interactions among actors intensify and innovation outcomes become more visible. In such contexts, universities shift from foundational roles toward amplification roles, supporting ecosystem scalability through talent formation, legitimacy, and coordination rather than direct venture creation.

## 3. CONCEPTUAL FRAMEWORK AND RESEARCH PROPOSITION

### *3.1. Integrating Knowledge, Innovation, and Ecosystem Dynamics*

Building on evolutionary economics, the Triple Helix framework, and entrepreneurial ecosystem theory, this study develops an integrative conceptual framework (represented on Figure 1) linking knowledge sources, dynamic capabilities, innovation types, and ecosystem dynamics. The framework is designed to explain how innovation emerges in Brazilian expansion-stage ecosystems, where formal R&D coexists with experiential learning, regulatory navigation, and user-driven experimentation.

At the center of the framework lies the entrepreneur or founding team, conceptualized as an agent capable of mobilizing heterogeneous knowledge inputs. These inputs are not static resources, but evolving stocks of experience and information that are continuously recombined through entrepreneurial action (Schumpeter, 1934; Nelson & Winter, 1982).

The framework distinguishes four primary categories of knowledge sources:

(a) prior professional and entrepreneurial experience,

(b) sectoral and regulatory knowledge,

(c) user- and market-based knowledge, and

(d) scientific and technical knowledge.

Rather than assuming that one category dominates innovation outcomes, the framework emphasizes complementarities among knowledge sources.

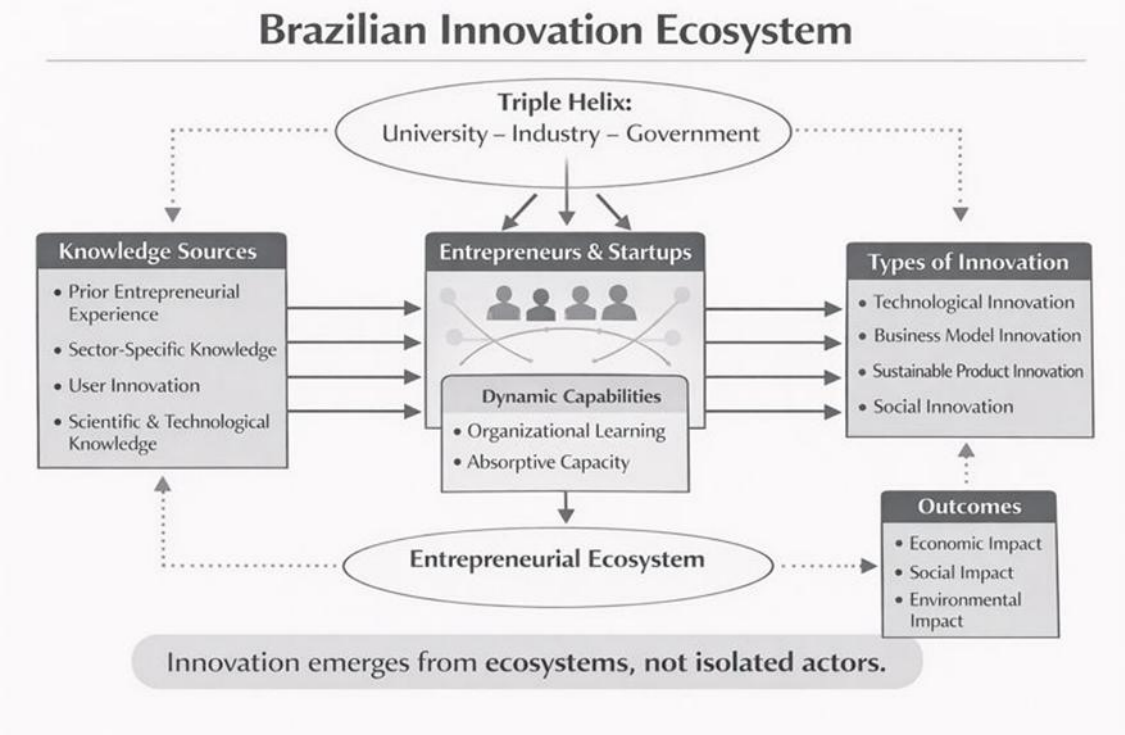


***Figure 1:*** *Conceptual framework linking knowledge sources, innovation types, and the Brazilian innovation entrepreneurial ecosystems.*

### *3.2. Prior Professional and Entrepreneurial Experience*

Prior professional experience constitutes a foundational knowledge source in entrepreneurial innovation. Founders draw on accumulated tacit knowledge regarding organizational processes, industry norms, supplier relationships, and customer behavior, shaping opportunity recognition and strategic decision-making (Polanyi, 1966).

Serial entrepreneurship further amplifies this effect by enabling learning from failure and prior exits, which is recycled into new ventures through mentorship and informal networks (Spigel, 2017).

> **Proposition 1:** Startups founded by teams with substantial prior professional or entrepreneurial experience are more likely to generate recombinative innovations than startups relying primarily on novel scientific knowledge.

### *3.3. Sectoral and Regulatory Knowledge*

Sectoral and regulatory knowledge is particularly salient in industries characterized by institutional complexity. In Brazil, regulatory frameworks often create both barriers

and opportunities for entrepreneurial innovation, especially in finance, health, and energy (Etzkowitz & Zhou, 2017).

> **Proposition 2:** In highly regulated sectors, sectoral and regulatory knowledge exerts a stronger influence on innovation outcomes than direct scientific or technological inputs.

### *3.4. User-Based and Market-Based Knowledge*

User interaction constitutes a continuous source of learning for startups operating in dynamic markets. Through feedback loops and experimentation, entrepreneurs adapt offerings and business models in response to evolving demand (von Hippel, 2005).

> **Proposition 3:** Startups that maintain intensive interaction with users are more likely to engage in business model and platform innovation than in product-centric technological innovation.

### *3.5. Scientific and Technical Knowledge*

Scientific and technical knowledge enhances innovation capacity when integrated with experiential and market-based knowledge. Universities contribute primarily through education and legitimacy rather than direct commercialization (Etzkowitz, 2008).

> **Proposition 4:** Scientific and technical knowledge enhances innovation outcomes when combined with experiential and market-based knowledge, rather than when applied in isolation.

### *3.6. Dynamic Capabilities as Mediators*

Dynamic capabilities mediate the relationship between knowledge sources and innovation outcomes by enabling learning, adaptation, and recombination (Teece et al., 1997).

> **Proposition 5:** The relationship between knowledge sources and innovation outcomes is mediated by dynamic capabilities reinforced by ecosystem density and institutional coordination.

### *3.7. Innovation Types and Ecosystem Stage*

Expansion-stage ecosystems favor innovation types that scale rapidly through networks and digital infrastructure (Spigel & Harrison, 2018).

**Proposition 6:** Expansion-stage entrepreneurial ecosystems are more conducive to business model and platform innovation than to radical technological innovation.

### *3.8 Universities as Ecosystem Anchors*

Universities exert influence primarily through human capital formation, legitimacy provision, and institutional orchestration (Etzkowitz & Zhou, 2017).

**Proposition 7:** Universities exert a stronger influence on entrepreneurial ecosystems through indirect institutional roles than through direct technology transfer mechanisms.

### *3.9. Government and Institutional Complementarities*

Government policies shape ecosystem conditions and interact with university and industry actors (Dosi et al., 2006).

**Proposition 8:** The effectiveness of university contributions to entrepreneurial ecosystems depends on complementarities with government policies and private investment.

### *3.10 Conceptual Framework*

The integrative conceptual framework for the Brazilian innovation ecosystem represented in **Figure 1** links knowledge sources, dynamic capabilities, innovation types, and entrepreneurial ecosystem dynamics within a Triple Helix configuration.

## 4. METHODOLOGIA AND EMPIRICAL ANALYSIS

### *4.1. Research Design and Epistemological Positioning*

This study adopts a qualitative multiple-case research design, which is particularly suitable for theory-building and theory-refining purposes in contexts characterized by complexity, heterogeneity, and institutional embeddedness (Yin, 2018). Entrepreneurial ecosystems represent such contexts, as innovative outcomes emerge from the interaction of multiple actors, knowledge sources, and institutional arrangements rather than from isolated organizational decisions.

From an epistemological perspective, the research is grounded in an interpretivist tradition, recognizing that entrepreneurial action and innovation are socially constructed and context-dependent phenomena (Eisenhardt, 1989). The objective is not statistical generalization, but analytical generalization, whereby empirical findings

are used to refine existing theoretical frameworks and generate propositions applicable to similar contexts (Yin, 2018).

The unit of analysis is the startup embedded within a regional entrepreneurial ecosystem. This choice allows for the examination of both firm-level knowledge mobilization and ecosystem-level institutional influences, consistent with the conceptual framework presented in **Figure 1**.

### *4.2. Case Selection and Sampling Strategy*

Cases were selected using purposeful sampling, guided by theoretical relevance rather than representativeness (Patton, 2015). The initial pool of cases was drawn from Pequenas Empresas & Grandes Negócios (PEGN), one of Brazil's most influential business magazines, which regularly profiles high-growth startups and emerging entrepreneurial trends.

Articles published between May and July 2020 were screened using the following criteria:

1. Evidence of external investment attraction (venture capital, private equity, or corporate investment).
2. Classification of the startup as operating within an expansion-stage entrepreneurial ecosystem, as defined by Spigel and Harrison (2018).
3. Continued operation and observable growth between 2020 and 2025, verified through company websites, press releases, and business media.
4. Sectoral diversity, including fintech, healthtech, energy, artificial intelligence, logistics, and sustainability.
5. Clear geographic embedding within recognized Brazilian entrepreneurial ecosystems.

This process resulted in a final sample of 11 startups embedded in ecosystems such as São Paulo, Campinas, Belo Horizonte (San Pedro Valley), Curitiba, and Salvador. These regions are characterized by the presence of major universities, active investment communities, and institutional intermediaries.

### *4.3. Data Sources and Collection Procedures*

Data collection relied primarily on secondary sources, a common and accepted practice in qualitative ecosystem research (Spigel, 2017). Sources included:

- PEGN case articles and interviews.

- Company websites and official communications.
- Press releases and investment announcements
- Business media reports and ecosystem mappings.
- Public information on universities and regional innovation programs.

Using multiple sources enabled triangulation and enhanced construct validity (Yin, 2018). Data was collected iteratively, allowing emerging insights to inform subsequent coding and analysis.

### *4.4. Data Analysis and Coding Strategy*

Data analysis followed a thematic coding approach combining deductive and inductive logic (Miles, Huberman, & Saldaña, 2014). An initial coding scheme was derived from the conceptual framework, focusing on knowledge sources, dynamic capabilities, innovation types, and university roles. This scheme was subsequently refined as patterns emerged from the data.

Cross-case comparison was employed to identify similarities and differences across sectors and ecosystems. Attention was given to how different knowledge sources were mobilized and how universities contributed indirectly to innovation processes.

**Table 1** and **Table 2** synthetize data collected from PEGN (2020) articles, company websites, press releases, and business media. Data analysis followed thematic coding and cross-case comparison, guided by the conceptual framework.

***Table 1:*** *Startups, founding year, website, type of innovation, and knowledge source*

| Startup | Year Founded | Website | Type of Innovation | Predominant Knowledge Source |
|---|---|---|---|---|
| Houpa! | 2017 | houpa.com.br | Business model | Sectoral experience |
| Fazenda Futuro | 2019 | fazendafuturo.io | Sustainable product | Scientific & sectoral knowledge |
| Celero | 2016 | celero.com.br | Business model | Entrepreneurial experience |
| Zenklub | 2016 | zenklub.com.br | Health/social | Professional & user knowledge |
| LogComex | 2016 | logcomex.com | Big Data | Sectoral & technical knowledge |
| Caju | 2019 | caju.com.br | Fintech platform | Regulatory & tech knowledge |
| Testfy | 2020 | testfy.com.br | Health diagnostics | Professional & regulatory |
| Alice | 2019 | alice.com.br | Health insurance | Managerial & medical |

| Startup | Year Founded | Website | Type of Innovation | Predominant Knowledge Source |
|---|---|---|---|---|
| Clarke Energia | 2017 | clarke.com.br | Energy efficiency | Engineering & regulatory |
| Arena | 2018 | arena.im | AI/Marketing | Technical & market |
| Swap | 2019 | swap.com.br | Fintech infrastructure | Platform & regulatory |

***Table 2:*** *Startups, entrepreneurial ecosystems, anchor universities, and university roles*

| Startup | Ecosystem | Anchor University | Main University Role |
|---|---|---|---|
| Houpa! | Campinas | UNICAMP | Talent formation, applied research |
| Fazenda Futuro | Campinas | UNICAMP | Scientific legitimacy, R&D skills |
| Celero | San Pedro Valley | UFMG | Entrepreneurial culture |
| Zenklub | São Paulo | USP / FGV | Professional training |
| LogComex | Curitiba | UFPR / UTFPR | Technical skills |
| Caju | São Paulo | USP / Insper | Managerial education |
| Testfy | São Paulo | USP | Health & tech training |
| Alice | São Paulo | USP | Medical & managerial |
| Clarke Energia | Salvador | UFBA | Engineering training |
| Arena | São Paulo–BH | USP / UFMG | AI talento |
| Swap | São Paulo | USP / FGV | Fintech expertise |

### *4.5 Empirical Findings: Knowledge Sources and Innovation Patterns*

#### 4.5.1. Fintech and Platform-Based Startups

Fintech and platform-oriented startups such as Celero, Caju, LogComex, and Swap illustrate innovation patterns dominated by regulatory interpretation, business model recombination, and digital infrastructure design. Founders typically possessed prior experience in finance, payments, logistics, or enterprise software, which enabled them to identify inefficiencies and compliance gaps within existing systems.

Consistent with **Propositions 1 and 2**, regulatory knowledge emerged as a critical enabler of innovation in these cases. Rather than developing novel financial

technologies from scratch, startups recombined existing digital tools with deep understanding of Brazilian financial regulation, producing scalable and compliant platforms. Universities contributed indirectly by training professionals in economics, law, and information systems, reinforcing ecosystem-level absorptive capacity (Etzkowitz & Zhou, 2017).

4.5.2. Health, Social, and Well-Being Innovation

Startups such as Zenklub, Alice, and Testfy exemplify health-related and social innovation grounded in professional expertise, regulatory navigation, and user-centered design. Founding teams typically included health professionals, psychologists, physicians, or managers with experience in healthcare organizations.

In line with **Propositions 3 and 4**, innovation in these cases was driven by continuous interaction with users and patients, combined with scientific and technical knowledge acquired through formal education. Universities played a legitimizing role by supplying trained professionals and reinforcing credibility in highly regulated health markets.

4.5.3. Energy, Sustainability, and Artificial Intelligence

Cases such as Clarke Energia and Arena highlight the role of engineering, data analytics, and sectoral knowledge in driving innovation. These startups leveraged technical expertise to address energy efficiency and marketing analytics challenges, respectively, while adapting solutions to market constraints and client needs.

Consistent with **Proposition 6**, innovation outcomes were predominantly incremental and application-oriented rather than radical technological breakthroughs. Universities contributed by supplying engineers and data scientists capable of integrating technical knowledge with practical problem-solving.

### *4.6. Cross-Case Synthesis*

Across all cases, three dominant patterns emerge:

**First**, innovation is overwhelmingly recombinative, relying on the integration of experiential, regulatory, and market-based knowledge rather than on original scientific discovery.

**Second**, dynamic capabilities - particularly learning-by-doing and absorptive capacity - mediate the transformation of knowledge into scalable innovation.

**Third**, universities exert influence primarily through indirect ecosystem-level roles, supporting **Propositions 5 and 7**.

These findings provide strong empirical support for the integrative conceptual framework proposed in **Figure 1**.

## 5. DISCUSSION, IMPLICATIOS, AND CONCLUSION

### *5.1. Theoretical Contributions*

This study contributes to the literature on entrepreneurial ecosystems, innovation, and the Triple Helix in several ways:

**First**, it empirically demonstrates that innovation in Brazilian expansion-stage ecosystems is predominantly recombinative, reinforcing evolutionary perspectives on innovation (Nelson & Winter, 1982; Schumpeter, 1934).

**Second**, it refines the Triple Helix model by emphasizing indirect and systemic university roles rather than linear technology transfer. This contribution responds to calls for contextualized interpretations of innovation systems in emerging economies (Dosi et al., 2006; Etzkowitz & Zhou, 2017).

**Third**, the study advances entrepreneurial ecosystem theory by explicitly linking knowledge sources, dynamic capabilities, and innovation types across ecosystem stages, extending the process-oriented framework proposed by Spigel and Harrison (2018).

### *5.2. Implications for Universities*

For universities, the findings suggest that the greatest impact on entrepreneurial ecosystems lies not in patent commercialization, but in human capital formation, interdisciplinary education, and ecosystem engagement. Programs that combine technical, managerial, and regulatory training are particularly valuable in expansion-stage ecosystems.

Universities may also enhance their role as neutral conveners, facilitating interaction among entrepreneurs, investors, and policymakers. Such orchestration functions strengthen ecosystem coherence and reduce coordination failures.

### *5.3 Implications for Policymakers and Ecosystem Orchestrators*

For policymakers, the results highlight the importance of ecosystem-level interventions rather than firm-specific subsidies. Policies that support talent

development, regulatory experimentation, and network-building are more likely to foster sustainable innovation than those narrowly focused on R&D commercialization.

Ecosystem orchestrators, including accelerators and development agencies, should prioritize mechanisms that enhance learning, knowledge circulation, and institutional trust.

### *5.4. Limitations and Future Research*

This study has limitations that suggest avenues for future research.

**First**, reliance on secondary data may limit access to fine-grained organizational processes. Future studies could incorporate primary interviews to deepen insight.

**Second**, the focus on successful expansion-stage startups may bias findings toward positive outcomes. Comparative studies including failed ventures would enrich understanding.

### *5.5. Conclusion*

This article advances understanding of how innovation emerges within entrepreneurial ecosystems in Brazil by demonstrating the centrality of knowledge recombination, dynamic capabilities, and institutional context. Universities play a critical but indirect role, suggesting that innovation strategies in emerging economies should move beyond linear models toward ecosystem-based approaches.

## 6. AI USE DECLARATION

The authors declare that artificial intelligence (AI) tools were used in the preparation of this manuscript to support language refinement, structural organization, and editing of the text. Specifically, generative AI was employed to assist in improving clarity, coherence, and academic writing style.

All substantive intellectual contributions - including the research design, theoretical framing, data selection, analysis, interpretation of results, and conclusions - are the sole responsibility of the authors. The authors critically reviewed, validated, and edited all AI-assisted outputs to ensure accuracy, originality, and alignment with academic standards.

No AI tool was used to generate empirical data, fabricate results, or replace scholarly judgment. All references were selected, verified, and formatted by the authors in accordance with APA 7 guidelines.

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