

# EXPLORING INNOVATION AND TRANSACTION CAPACITY IN THE NORTHERN RIO GRANDE DO SUL, BRAZIL

## EXPLORANDO A INOVAÇÃO E A CAPACIDADE DE TRANSAÇÃO NO NORTE DO RIO GRANDE DO SUL, BRASIL

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### A B S T R A C T

This study investigates the role of regional innovation ecosystems in enhancing startups' transaction capacity, specifically in the context of Northern Rio Grande do Sul, Brazil. Specifically, it explores the underlying processes employed to mitigate uncertainty, formalize agreements, and streamline negotiations among regional stakeholders. Adopting an exploratory-qualitative framework, the research draws on semi-structured interviews with founders from ten startups affiliated with two prominent regional innovation hubs. The findings reveal that while the ecosystem bolsters credibility and facilitates customer referrals, it faces challenges in fostering deep-seated connectivity, thereby limiting visibility into broader business opportunities. Furthermore, while the ecosystem nurtures a customer-centric orientation, its direct influence on deepening client relationships remains peripheral. By integrating transaction cost theory with innovation ecosystem literature through thematic content analysis, this study advances the theoretical understanding of how relational and institutional arrangements configure transactional dynamics. Theoretically, it extends the construct of transactional capacity to the ecosystem level, highlighting inherent asymmetries in how these environments mediate commercial interactions. Practically, the study offers strategic insights for ecosystem managers and policymakers, pinpointing

ting coordination gaps and systemic hurdles that must be addressed to enhance stakeholder integration and economic development.

#### KEYWORDS

Innovation Ecosystems; Startups; Transaction Capacity; Regional Development; Customer Relationships; Management

#### RESUMO

*Este estudo investiga o papel desempenhado pelos ecossistemas de inovação no fortalecimento da capacidade de transação de startups, no contexto do Norte do Rio Grande do Sul, Brasil. De forma específica, explora os processos subjacentes empregados para mitigar incertezas, formalizar acordos e agilizar as negociações entre os atores regionais. Adotando uma estrutura qualitativa-exploratória, a pesquisa baseia-se em entrevistas semiestruturadas com fundadores de dez startups vinculadas a dois proeminentes polos regionais de inovação. Os resultados revelam que, embora o ecossistema reforce a credibilidade e facilite a indicação de clientes, enfrenta desafios no fomento de uma conexão profunda, o que restringe o olhar para oportunidades de negócios mais amplas. Além disso, embora o ecossistema estimule uma orientação centrada no cliente, sua influência direta no aprofundamento do relacionamento com eles permanece periférica. Ao integrar a teoria dos custos de transação à literatura sobre ecossistemas de inovação por meio da análise de conteúdo temática, este estudo avança na compreensão teórica de como os arranjos relacionais e institucionais configuram as dinâmicas transacionais. Teoricamente, o trabalho estende o constructo de capacidade transacional ao nível do ecossistema, destacando assimetrias inerentes à forma como esses ambientes medeiam as interações comerciais. Em termos práticos, o estudo oferece subsídios estratégicos para gestores de ecossistemas e formuladores de políticas, identificando lacunas de coordenação e gargalos sistêmicos que devem ser superados para ampliar a integração entre os stakeholders e promover o desenvolvimento econômico.*

#### PALAVRAS - CHAVE

*Ecossistemas de Inovação; Startups; Capacidade de Transação; Desenvolvimento Regional; Relacionamento com Clientes; Gestão.*

## INTRODUCTION

Global dynamism has intensified the search for sustainability and innovative business models. Innovation, defined as the introduction of new products, services, production methods, markets, or organizations (Schumpeter, 1982), is central to startups, which pursue scalable and profitable business models (Blank & Dorf, 2012). Startups embody innovation, experimenting with new ideas and adapting to technological change (Amorim & França, 2023; Pimenta & Lana, 2020; Skala, 2019).

However, they face barriers such as high innovation costs, a lack of managerial skills, and limited collaboration (Noelia & Rosália, 2020). Young firms depend on external actors, especially in the early stages, to enhance their innovation capacity (Fukugawa, 2018; Marcon & Ribeiro, 2021).

Innovation capacity encompasses technological learning, management, and transaction capabilities, enabling firms to deliver market-validated solutions and establish a competitive advantage (Zawislak et al., 2012). Among these, transaction capacity, processes linking innovation to the market through sales, branding, negotiation, logistics, and after-sales, plays a crucial role in reducing transaction costs (Reichert et al., 2015).

From a transaction cost perspective (Williamson, 1993), governance structures that promote coordination, trust, and information exchange tend to reduce uncertainty and improve transactional efficiency. In this sense, innovation ecosystems may function as institutional and relational arrangements that facilitate interactions among startups and key actors such as universities, investors, and support organizations (Adner, 2006). By fostering connectivity, shared norms, and resource complementarities, ecosystems can lower coordination costs and strengthen startups' transaction capacity.

Innovation ecosystems, comprising companies, universities, and government organizations, offer startups resources, collaboration opportunities, and market access (Adner, 2006). Ecosystem actors reduce barriers to innovation and help startups adapt to volatile environments (Fukugawa, 2018; Walrave et al., 2018; Noelia & Rosália, 2020). Despite this interdependence, little research has examined how ecosystems foster startups' transaction capacities. Fukugawa (2018) highlights incubator resources, while Marcon and Ribeiro (2021) explore resource management across the startup lifecycle. Identifying which ecosystem actions directly support startups remains a challenge.

In this study, we focus on Northern Rio Grande do Sul, a leading Brazilian innovation hub with 16 technology parks, 43 incubators, Senai institutes, Embrapii units, and over 1,000 startups (Secretary of Innovation, Science and Technology, 2022). The guiding question is: How do startups perceive the performance of the regional innovation ecosystem in terms of its transaction capacity? This involves exploring how startups define the ecosystem, the positive and negative aspects of participation, and the opportunities and challenges for strengthening transactions among actors.

## THEORETICAL BACKGROUND

At the end of the 20th century, specifically in the 1990s, new forms of entrepreneurship emerged, including startups. A startup is an organization that seeks a scalable and profitable business model (Blank and Dorf, 2012). Furthermore, a startup can be defined as an institution that creates innovative products and services in uncertain situations. Startups are considered companies born with technological foundations and disruptive innovations that drive market growth and generate competitiveness. Furthermore, Skala (2019) defines startups as innovation actors who use technologies in their operations.

The distinction between startups and other companies is being questioned in academia and the business world. Skala (2019) identifies four main distinguishing characteristics: operating time and scarce financial resources; innovation (startups offer innovative solutions); development and scalability (startups grow fast and are ambitious); and operations supported by technology. The author presents a model of startup definition called the “startup definition spiral.” The model defines a startup according to the organization's maturity, dividing the startup's life cycle into three primary stages: initial, expansion, and maturity. At an early stage, a startup is defined as an organization with limited resources that identifies a market problem. In the expansion phase, it is a rapidly growing organization; in the maturity phase, it is a highly scalable company.

In the current Brazilian scenario, according to the Brazilian Startup Association, approximately 14,000 startups were identified in 2022. Furthermore, the latest Mapping of the Brazilian Startup Ecosystem conducted a study with 1,753 startups across 266 cities in the Brazilian territory. It is noted that the regional distribution is more significant in the Southeast (53.2%), South (23.6%), and Northeast (13.1%). In the North (5.0%) and Central-West (5.1%) regions, there are fewer participating startups (Associação Brasileira de Startups, 2022).

In this study, the main profiles of participating startups can be identified: 14.5% tech (education), 9.1% fintech (finance), 8.9% health tech, and life sciences (encompassing health and well-being). The participation of these startups in innovation hubs (75.4%), academia (53.7%), and corporate (49.4%) stands out, demonstrating a network of cooperation with startups and relationships with market players. Finally, 60.4% of startups indicate that they did not receive investment, and one of the main reasons was that they were preparing to start looking for investments (37.8%); this data can be considered for the creation and improvement of ecosystems of innovation capable of helping startups throughout their processes, from ideation, operation, traction, to scale-up.

However, the path to success for a startup is challenging. Startups typically encounter challenges such as high innovation costs, a lack of commercial and managerial expertise, and difficulties collaborating with other parts of the industry (Noelia & Rosália, 2020). It is estimated that in Brazil, at least 25% of startups cease their activities in the first year of life, and 50% disappear by the fourth year (Arruda, Nogueira, Cozzi, & Costa, 2014).

One way startups can access resources more easily is through the actors who make up an innovation ecosystem (Marcon & Ribeiro, 2021). Interactions between startups and actors can strengthen value co-creation by combining the specific needs of both parties, including those of startups (Marcon & Ribeiro, 2021). According to Fukugawa (2018), early-stage startups benefit most from interactions with external actors, as they depend on them to improve their innovation capabilities.

Furthermore, when several actors act together, obstacles during the startup's innovation process can be reduced (Noelia & Rosália, 2020). Moreover, startup entrepreneurs must maintain and strengthen connections with actors in an innovation ecosystem, as these connections benefit startups throughout their journey (Noelia & Rosália, 2020). According to Audretsch et al. (2023),

collaboration within the innovation ecosystem or business groups can enhance management and quality control systems in startups, which often lack financial resources and qualified labor for their development.

## Innovation Ecosystems

In this study, the definition of innovation ecosystem follows Granstrand and Holgersson (2020), who conceptualize it as an evolutionary set of actors, activities, products and services, institutions, and relationships, including complements and substitutes, that are essential for the innovative performance of an agent or population of agents. This definition encompasses key elements highlighted in literature, such as collaboration and value co-creation among heterogeneous actors (Adner, 2006; Walrave et al., 2018), while also incorporating institutional interactions consistent with the Triple Helix perspective.

Adner (2006) defines an innovation ecosystem as a collaborative network in which members combine their offerings into a coherent customer-facing solution. An innovation ecosystem is similar to a business ecosystem in that both aim to create cooperative networks for innovation; however, the former is primarily concerned with value creation, while the latter focuses on capturing value (Gomes et al., 2018).

Walrave (2018) defines an innovation ecosystem as a network of interdependent actors that combine resources and capabilities to co-create and deliver a value proposition to end users, thereby appropriating the gains from this process. Furthermore, these innovation ecosystems are supported by the concept of open innovation, as outlined by Chesbrough (2003). This would be a set of internal and external ideas focused on market needs and on advancing technology. The author argues that open innovation is more successful than closed innovation, where a company develops its entire innovation process internally.

Recent studies have expanded the discussion on innovation ecosystems by examining their reconfiguration in the post-pandemic context. Scholars highlight the increasing role of digitalization, hybrid collaboration models, and stronger governance mechanisms as central elements for ecosystem resilience and coordination (Autio, Nambisan, Thomas & Wright, 2023; Jacobides, Cennamo & Gawer, 2024). Additionally, recent research emphasizes that growing interdependence among actors requires clearer role definition and more structured coordination to reduce uncertainty and transaction costs within ecosystems (Ritala, Almpantopoulou & Vanhaverbeke, 2023).

In a study by Granstrand and Holgersson (2020), a systematic review of 120 publications on the definitions of innovation ecosystems identified 21 distinct definitions. In these definitions, the component that appears in all of them is the set of actors. The second most common element was collaboration, which appeared in 16 definitions, and the third was activity, appearing in 15 definitions (Granstrand & Holgersson, 2020). Therefore, definitions of innovation ecosystems highlight the importance of collaboration among actors. This study proposes a definition of an

innovation ecosystem as an evolutionary set of actors, activities, products/services, institutions, and relationships, including complements and substitutes, that are essential for the innovative performance of an agent or population. Of actors (Granstrand & Holgersson, 2020).

Furthermore, the Triple Helix model proposes a structure that describes the interactions and collaborations among three critical actors in the innovation process: universities, companies, and government (Etzkowitz, 2000). Furthermore, Etzkowitz (2000) highlights that several countries and regions seek to achieve the Triple Helix, with the common objective of creating an innovative environment formed by universities, companies, and government, characterized by strategic alliances operating in different areas and at varying levels of technology.

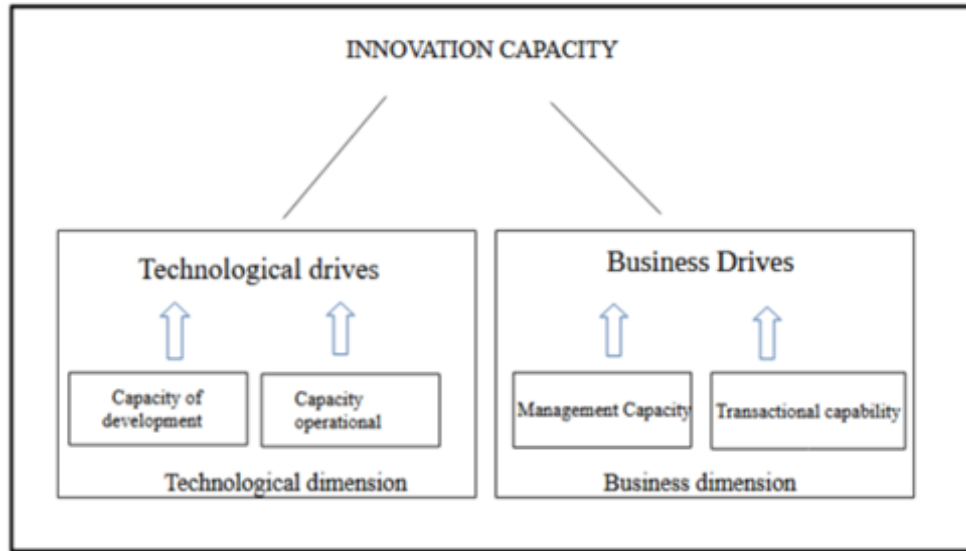
However, Etzkowitz (2000) recognizes that the interaction of these three actors is complex, highlighting the need to create intermediary organizations to unite them. Innovation ecosystems are fundamental to a country's economic and technological development, as they bring together diverse groups, including people, companies, universities, governments, and investors, to create innovative solutions to current challenges.

## Transaction Capacity

Teece (1986) examines how companies can obtain competitive advantage and profit from innovation. A company's capacity for innovation generates competitiveness; however, profiting from innovations requires finding complementary sources, channels, and assets to bring them to market (Teece, 1986). According to Zawislak et al. (2012), a company's innovation capacity is defined as a technological learning process: its capacity for technology development and operation, as well as its management and transactional routines. Innovation capacity refers to a company's ability to deliver new, market-validated solutions.

The company must take to the market everything it develops, operates, manages, and generates economic value (Alves et al., 2017). The model proposed by Zawislak et al. (2012) suggests that a company's innovation capacity is based on four sub-capabilities; that is, innovation results from activities across the four main areas of a company: develop, operate, manage, and transact. Most companies comprise four essential areas: development, operations, management, and transactions. Furthermore, a company with the capacity to innovate can meet future demands and thus add value (Ahn, Kim & Lee, 2022).

Furthermore, these capabilities are grouped into technological and business drivers (Alves et al., 2017). Technological drivers or development capabilities indicate the company's ability to generate and operationalize goods or services. Business drivers (management and transaction capacity) concern taking the good or service to market and the company's ability to manage and sell it (Alves et al., 2017). Figure 1 stands out with the presentation of technological and business drivers:

**Figure 1: Model - Innovation Capacity**

SOURCE: ELABORATED BASED ON ALVES ET AL. (2017).

A study was conducted to understand the innovation capabilities of startups, following the model proposed by Zawislak et al. (2012), which enabled startups to identify their weaknesses and avoid mistakes that could prevent them from succeeding (Tullius & Schaeffer, 2016). Focusing on the transaction or commercialization capacity proposed in the highlighted model, it encompasses the skills, routines, and knowledge necessary to transact products or services in the market (Zawislak et al., 2012). This ability requires knowledge of sales, marketing, and customer relations, encompassing acquisition, after-sales support, and supplier management. Zawislak et al. (2012) argue that transaction capacity encompasses all the processes a company undertakes to reduce costs within each process.

Williamson (1993) initially proposed the theory of transaction costs, which posits that economic transactions occur in different environments, such as hierarchies and contracts, as each environment incurs specific expenses related to its transactions. Transaction costs typically encompass identifying actors, negotiating terms, drafting contracts, and overseeing compliance. Transaction capacity connects innovation with the market through different commercial activities (Zawislak et al., 2012). Companies can start by applying knowledge based on technology. However, this will not guarantee its existence; the product or service must be manufactured at the lowest possible cost, supported by a management structure, traded on the market with minimum expenses, and generate Schumpeterian (extraordinary) profits (Zawislak et al., 2012).

## METHOD

The study employs a qualitative approach. The research was divided into three stages: bibliographic research, data collection, and analysis. Bibliographic research provided theoretical support for the development of the data collection instrument.

The study focuses on Northern Rio Grande do Sul, an emerging region in terms of innovation. The choice of this region was based on the density of innovative actors in the area, including startups, technology parks, and public initiatives, enabling a focused study of an emerging ecosystem. This delimitation allows for an in-depth analysis of the dynamics and challenges of local innovation movements. Movements A and B were intentionally selected as empirical focal points because they represent the most structured and institutionally consolidated innovation initiatives in the region. Both concentrate a significant number of startups, articulate partnerships among universities, firms, and public actors, and play a central role in coordinating regional innovation activities. Therefore, they were chosen as representative nuclei of the Northern Rio Grande do Sul innovation ecosystem.

The second phase consisted of interviews with strategic-level founding partners of startups between August and December 2023. The selection was made through initial contact with the startups, and the founding partners were selected. Two startups that participated in initiatives promoted by the two main innovation movements in the city and region (Movements A and B) chose not to participate in this research. Furthermore, a total of 220 minutes was recorded, averaging 22 minutes per interview. Finally, 46 pages of transcribed content were obtained, totaling 29,715 words. The names of the innovation movements were kept confidential in this document.

According to institutional guidelines, studies involving adult professionals with minimal risk do not require formal approval from a Research Ethics Committee. However, all ethical procedures were rigorously followed. Participants were informed about the research objectives, their confidentiality and anonymity were guaranteed, and they voluntarily agreed to participate.

Table I presents the startups that were interviewed, including their segments, their connection with innovation movements in the Northern Rio Grande do Sul, and the number of employees of each one:

**Table I: Startup interviews, their segments, connection with innovation movements, and number of employees**

Startup	Segment	Movement	Number of collaborators
Startup 1	Education	Movement A	1
Startup 2	Advocacy	Movement A	15
Startup 3	Education	Movement A	32
Startup 4	Education	Movement A	8

Startup	Segment	Movement	Number of collaborators
Startup 5	Education	Movement A	9
Startup 6	Real Estate	Movement A	20
Startup 7	Technology	Movement A	15
Startup 8	Technology	Movement B	27
Startup 9	Technology	Movement B	20
Startup 10	Education	Movement B	42

SOURCE: ELABORATED BY THE AUTHORS (2024).

The third stage consisted of data analysis. The interviews were conducted with partners of the foundations who work at a strategic level and were transcribed before verification. The content analysis technique proposed by Bardin (2016) was used for data analysis. It was divided into three phases: pre-analysis, exploration of the material, and treatment of the results, including inferences and interpretation. The analysis categories were previously defined based on the structure of the data collection instrument, covering the following themes: innovation ecosystems, transaction capacity, and opportunities and challenges, with a focus on their managerial implications. Additionally, the MAXQDA 2024 software was contracted to validate the results, facilitating the analysis and interpretation of the data.

As an instrument for data collection, a semi-structured script was prepared based on the theoretical framework, particularly that of Zawislak et al. (2012). Furthermore, analysis categories were created, which sought to address the proposed objectives:

1. Understand how the innovation movement in Northern Rio Grande do Sul, as the interviewees refer to it, is perceived by startups, highlighting both the positive and negative aspects of being part of it.
2. Identify the perception of the innovation ecosystem's performance regarding the transaction capacity of startups.
3. Identify the opportunities and challenges that this innovation ecosystem will face in encouraging transactions between network members.

The selection criteria focused exclusively on startups connected to Movements A and B to maintain the study's coherence and consistency. Although the sample includes only startups affiliated with Movements A and B, this delimitation was intentional to ensure greater alignment with the study's objectives and to enable a more in-depth analysis of the impact of specific initiatives on the development of transaction capacity. This approach provides a clearer understanding of how these movements influence startups within the regional innovation ecosystem.

Startups in the Northern Rio Grande do Sul were selected as an object of study. Furthermore, we sought to apply another inclusion criterion: selecting startups in contact with the city's

innovation movements, which aim to engage stakeholders and promote local businesses, as well as those more adept at addressing social issues and integrated within the innovation ecosystem. To achieve this, we searched through two independent movements: Movement A and Movement B.

Movements A and B were chosen as the study's focal points due to their relevance in the regional innovation ecosystem. Movements A and B were selected as the primary local actors in innovation ecosystems, widely recognized for their ability to attract startups and foster regional connections. These movements represent distinct yet complementary approaches to fostering innovation, providing a comprehensive view of the ecosystem dynamics in Northern Rio Grande do Sul.

Movement A is made up of entrepreneurs and leaders from different market segments. Its mission is to foster, through business collaboration, the innovation ecosystem and development of the Northern RS; its activities are focused on pillars of innovation, such as acceleration and investment in startups and corporations and the creation and dissemination of a culture of innovation, bringing together companies from different segments, including retail, pharmaceutical, food, energy, and health (excerpt taken from the movement's organizational website, with the name kept confidential).

Movement B is an environment of innovation and entrepreneurship within a university in Passo Fundo. It is an innovation movement led by individuals who connect university research with startups and large companies, thereby enhancing innovation. They operate across the region's main areas: health, agribusiness, education, and service provision. Movement B provides services ranging from physical infrastructure for setting up companies to service provision (excerpt taken from the movement's organizational website, with the name preserved confidentiality).

## RESULTS AND DISCUSSION

### Innovation Ecosystem

The findings presented in this section integrate evidence from interviews, documentary analysis, and survey data. Rather than examining each methodological procedure separately, the results are organized around analytical dimensions that reflect convergent patterns identified across the different data sources.

Innovations are increasingly developed and commercialized by networks of co-creating actors, defined as innovation ecosystems (Walrave, 2018). Innovation ecosystems aim to facilitate joint efforts to develop innovations that can be delivered to the market. From the interviews carried out in Table 2, actions implemented in the analyzed region stand out, such as the creation of an innovation secretary in the city of Passo Fundo in 2023, which shows how startups perceive innovation movements:

**Table 2 - Perception of innovation movements in the Northern Rio Grande do Sul**

Category	Excerpts from interviews	Startups	Movement
Perception of the innovation movement in the city of Passo Fundo	The movement has been gaining momentum, particularly within the quadruple helix, involving government, business, and civil society.	Startup 1	Movement A
Perception of the innovation movement in the city of Passo Fundo	From 2022 to 2023, we started to have a maturing ecosystem. We do not have it; we do not consider it a ready ecosystem, but a maturing ecosystem, already much better than I could have imagined 10 years ago.	Startup 2	Movement A
Perception of the innovation movement in the city of Passo Fundo	I see a movement today with many regional and local participants. It is an interesting movement, so it is at its peak for me.	Startup 3	Movement A
Perception of the innovation movement in the city of Passo Fundo	They are cells, and I believe in innovation and entrepreneurship; cells spread across the city.	Startup 4	Movement A
Perception of the innovation movement in the city of Passo Fundo	We have made significant progress in organizing people into ecosystems, right? There was no group organization like that, and now we have several.	Startup 5	Movement A
Perception of the innovation movement in the city of Passo Fundo	It is a timid movement. However, at the end of 2023, I will step in to consolidate and tighten this movement. It is still primarily a business rather than a community.	Startup 6	Movement A
Perception of the innovation movement in the city of Passo Fundo	I believe that with this union, the movement has now—on several fronts, I think this is the correct term—realized the strength that Passo Fundo has and can bring this recognition to the region, which will generate more opportunities.	Startup 7	Movement A
Perception of the innovation movement in the city of Passo Fundo	From that year onward, a more significant mobilization began as well. So I am thrilled. We have noticed companies appearing and people looking. There is a recent movement I was not previously aware of.	Startup 8	Movement B
Perception of the innovation movement in the city of Passo Fundo	More movement is emerging as time passes. However, in some movements, people do not fully understand what innovation is.	Startup 9	Movement B
Perception of the innovation movement in the city of Passo Fundo	There are launch events and media coverage of the innovation process, but concrete actions can encourage specific stages of innovation, seek investment, and bring new products to market. I especially do not see it, and I am not aware of it.	Startup 10	Movement B

SOURCE: ELABORATED BY THE AUTHORS (2024)

According to the excerpts presented, the interviewees recognize the advancement of innovation movements in the Northern Rio Grande do Sul, especially between 2022 and 2023, as said by the founding partner of startup 2: “In 2022-2023, we started to have a maturing ecosystem. We do not have it; we do not consider it a ready ecosystem, but a maturing ecosystem, already much better than I could have imagined ten years ago.”

Some interviewees question this growing movement, arguing that these are just events held and that there needs to be a better understanding of what innovation is and what actions encourage startups to innovate. Excerpts from the speeches of the founding partners of startups 9 and 10 highlight this issue: “My perception is that there is much movement emerging more and more as time passes, but sometimes in some movements, I see that people do not quite understand the which is innovation”, “There are launch events, there are media on the innovation process, but concrete actions that can encourage, in particular, stages to innovate, to seek investment, to bring new and different products. I, in particular, do not see or know it.”

Furthermore, we sought to understand what the interviewees know about innovation ecosystems. Adner (2006) states that an innovation ecosystem is a collaborative network in which members combine their offerings into a coherent customer-facing solution. Given their perception of an innovation ecosystem, the interviewees identified the key terms.

The most prominent terms are companies, innovation, and actors. With words such as group, set, multiple, and involved, there is an understanding that an innovation ecosystem needs more than several different actors working collectively and supporting each other, searching to meet everyone's needs and development. This corroborates Walrave (2018), who defines an innovation ecosystem as a network of interdependent actors that combine resources and capabilities, with key actors seeking co-creation, delivering a value proposition to end-users, and appropriating the gains from this process. Finally, the term "city hall" shows that the interviewees recognize the participation of the public sector within an innovation ecosystem, in line with the Triple Helix model, where a structure is proposed that describes the interaction and collaboration between the three key actors in the innovation process: universities, companies, and government (Etzkowitz, 2000).

Furthermore, they were asked to identify the main positive aspects of being part of the innovation ecosystem in Northern Rio Grande do Sul. Terms such as knowledge, networking, opportunities, and business are highlighted. There are also terms such as 'exchange' and 'help,' which reinforce the main positive points of being part of the innovation ecosystem in Northern Rio Grande do Sul. This ecosystem is in contact with various actors to exchange experiences, conduct business, and accelerate startups' innovation.

On the other hand, the main negative aspects of being part of the innovation ecosystem in Northern Rio Grande do Sul were investigated. It is noted that there is a perception about the number of meetings, agendas, and events held without an established purpose; this becomes evident when the terms productive, result, agenda, empty, and return are connected. Furthermore, terms such as "bubble", sub-ecosystems, competition, and sets suggest that within the region's innovation ecosystem, several groups may be more open to forming relationships, allowing everyone to mature. Competition can seem like a negative, but it is also an opportunity to share ideas.

Granstrand and Holgersson (2020) define an innovation ecosystem as an evolutionary set of actors, activities, products/services, institutions, and relationships, including complements and substitutes, that are important for the innovative performance of an agent or population of actors. Table 3 lists some excerpts from the interviews carried out, as well as defining the startups they refer to:

**Table 3 - Perception of Movement A**

Category	Excerpts from the Interviews	Startup	Movement
Perception about Movement A	The hub they are creating, the physical space, will be necessary. What is missing is that they interfere. This attracts a lot of attention, but there are few startup openings.	Startup 5	Movement A
Perception about Movement A	I think Movement A's work is fundamental. We are renting a room in the hub and plan to move in December. Movement A is slightly plural, so they are more closely associated with innovation.	Startup 6	Movement A
Perception about Movement A	Movement A is not yet fully established, but it provides numerous connections and relationships. However, it tends to operate within a bubble, and expanding beyond it would increase its impact.	Startup 4	Movement A
Perception about Movement A	I followed Movement A well until its foundation because it was born within the college. At the same time, we were setting up Startup 3; they were being set up as well. It is a very business-oriented movement, which is much more market-oriented.	Startup 3	Movement A
Perception about Movement A	Movement A is a robust endogenous ecosystem with the potential to generate wealth and support startups through an investment fund. However, past funds left the region, highlighting the need to retain resources locally and prioritize regional candidates. Its leaders are active and influential, although personal interests can sometimes limit their effectiveness.	Startup 2	Movement A
Perception about Movement A	Movement A is still developing and not intensely focused on technological products. While it aims to foster connections, support startups, and promote innovation, it lacks a clearly defined positioning.	Startup 1	Movement A

Category	Excerpts from the Interviews	Startup	Movement
Perception about Movement A	Movement A excels in networking, providing companies with knowledge, investment, and opportunities through lectures and events. This support provides both funding and expertise, essential for technology and innovation companies to bring ideas to life.	Startup 7	Movement A
Perception about Movement A	I know little about the movement, which is still new. For example, I know they are opening the hub there, and there will be rooms available for rent to address these issues. However, I know very little beyond that.	Startup 9	Movement B
Perception about Movement A	I do not know the Movement A.	Startup 8	Movement B
Perception about Movement A	I do not participate in Movement A, but I did participate in the launch not long ago. Moreover, I couldn't—I cannot give you an opinion—because I do not know their level. I do not know. I owe you this one.	Startup 10	Movement B

SOURCE: ELABORATED BY THE AUTHORS (2024).

After analyzing the interviews in Table 3, the objective was to finalize the block on Innovation Ecosystems. Thus, to contemplate the criteria for the innovation movements in the city of Passo Fundo and the region of RS, Movement A, and Movement B, we sought to understand what the perception was about both, also carrying out a report of the interviews about Movement B (Table 4):

**Table 4 - Perception of Movement B**

Category	Excerpts from the Interviews	Startup	Movement
Perception about Movement B	From my understanding, Movement B focuses more on technological and product innovation, as well as related aspects. This becomes a more tangible innovation, so to speak, and as a result, it becomes more visible to companies. In this sense, companies have a greater connection with it.	Startup 1	Movement A

Category	Excerpts from the Interviews	Startup	Movement
Perception about Movement B	I am not familiar with Movement B, but it appears to be more limited in scope and focused on individuals already connected to the university. It appears more like a host of ecosystem initiatives than an active participant driving impactful change in the region.	Startup 2	Movement A
Perception about Movement B	From the outside, my view of Movement B is that it is much more oriented towards infrastructure, with a focus on business, engineering, and more mechatronic work. That is it. They are a highly academic movement in terms of innovation, research, and development, and they have their value.	Startup 3	Movement A
Perception about Movement B	I think so; Movement B, companies that need, now I am talking physically, need to establish themselves physically; Movement B today serves much more than Movement A	Startup 4	Movement A
Perception about Movement B	I have limited knowledge of Movement B and am only familiar with a few companies that have been incubated there. They have made progress in improving their space and publicizing connections with industry and universities. While they provide incubation opportunities, I have not yet had the chance to engage with them directly.	Startup 5	Movement A
Perception about Movement B	Movement B is more targeted at individuals with a relationship to the university. For example, I have never been to any of their activities because I am not a former student of the University. Therefore, we understand that a club like this is associated with a rivalry between educational institutions.	Startup 6	Movement A
Perception about Movement B	I have little contact with the B Movement. I watch the news about the movements, but I never get involved. I am not familiar with their structure and therefore am not qualified to offer an opinion about them.	Startup 7	Movement A

Category	Excerpts from the Interviews	Startup	Movement
Perception about Movement B	Although we are no longer part of Movement B, we were there for about a year. It now hosts both incubated and larger companies, and its educational connections facilitate some activities. While business rounds occur, they are not routine, and my perception may not reflect recent developments, so Movement B might be broader than I experienced.	Startup 8	Movement B
Perception about Movement B	I am only familiar with Movement B. We are very connected to it. My partner is a professor at the University, and he introduced us to this relationship with professors; we are affiliated with the B Movement.	Startup 9	Movement B
Perception about Movement B	Before becoming resident associates, we were incubated at Movement B for 3.5 years. We have also visited other innovation hubs, including Caldeira and one in Porto Alegre, and engaged with technology parks in other states and countries, showing strong involvement in the broader innovation ecosystem.	Startup 10	Movement B

SOURCE: ELABORATED BY THE AUTHORS (2024)

A key finding is the mutual lack of awareness between startups in Movements A and B. Startups in Movement B reported limited knowledge of Movement A, while Movement A participants viewed Movement B as more exclusive and university-oriented, fostering rivalry between educational institutions. This perspective is echoed by the founding partner of Startup 2, who emphasized that Movement B tends to limit its scope of action to those already close to academic environments. They described Movement B as acting in a paternalistic way toward university affiliates, serving more as a host for ecosystem initiatives than as a truly active ecosystem actor capable of driving impactful change in the region.

Some respondents described Movement B as business- and market-oriented, yet firmly rooted in academic innovation, research, and development. Its strengths lie in physical and technological infrastructure, particularly supporting visible product innovations, making it a natural hub for companies needing tangible facilities. Movement A is recognized for fostering connections and networking, providing both knowledge and investment opportunities crucial for technology startups. Companies benefit from lectures, events, and interactions with established actors, though the ecosystem still operates within a somewhat limited “bubble” that could expand further.

The findings reveal distinct identities and contributions of each movement. Movement B is more associated with academia, infrastructure, and tangible technological innovations, while

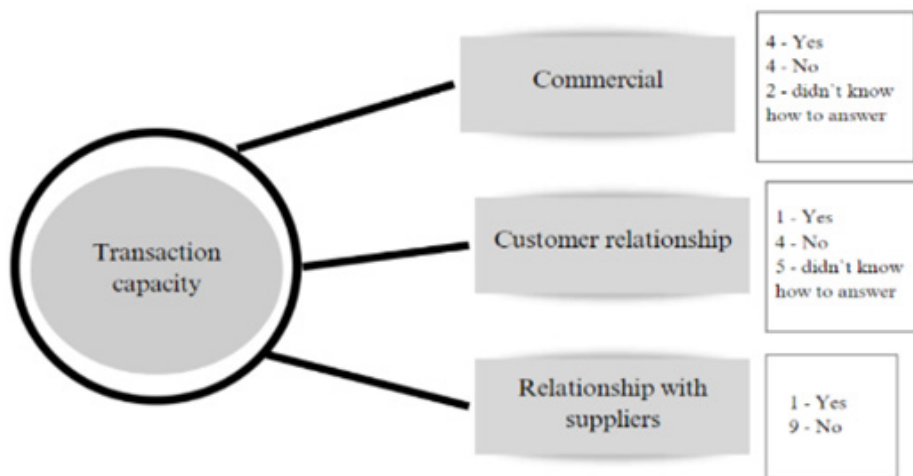
Movement A stands out for its relational capital, networking, and capacity to attract financial resources. Importantly, interviewees acknowledged that the proposals and characteristics of both movements could be complementary. However, the current fragmentation and lack of interaction—often perceived as "clubs" within the Northern Rio Grande do Sul region—may hinder broader development. Strengthening connections between these movements and overcoming institutional rivalries is seen as an essential step toward building a more cohesive and impactful regional innovation ecosystem.

## Transaction Capacity

The following analysis synthesizes empirical evidence from multiple data collection procedures, highlighting convergent insights regarding how the regional innovation ecosystem affects startups' transaction capacity.

To verify whether the interviewees perceive the performance of the innovation ecosystem in terms of its transaction capacity, which is responsible for connecting innovation with the Market through different commercial activities (Zawislak et al., 2012), related questions were prepared in areas of commercial, customer relations, and supplier relations. Thus, Figure 2 is presented:

**Figure 2 - Perceived performance on transaction capacity**



SOURCE: ELABORATED BY THE AUTHORS (2024).

Companies can start with the applicability of knowledge based on technology. However, more is needed to guarantee its existence. The product or service must be manufactured at the lowest possible cost, supported by a management structure, traded at minimum costs, and generate Schumpeterian (extraordinary) profits (Zawislak et al., 2012).

Given the interviews carried out to verify the performance of the innovation ecosystem in the Northern Rio Grande do Sul regarding the transaction capacity, the commercial area is the one with the most outstanding performance; this is because customer referrals, credibility, and positioning in being part of the movement. From a Transaction Cost Economics perspective (Williamson, 1993), the credibility derived from belonging to the ecosystem reduces information asymmetry and lowers search and negotiation costs in commercial transactions. By signaling legitimacy, startups decrease perceived uncertainty and facilitate contract formation with new clients, thereby enhancing their transaction capacity.

On the other hand, when they do not notice this action, it is due to the lack of connections that could be made through the ecosystem, as the founding partner of Startup 1 says: “So, as the business would be designed B2B2C, it would help precisely with this B2B issue, right? Reaching companies and making these connections. Reaching these customers, especially those more focused on large companies, may be a way to connect with them, as it is traditionally difficult to do so.

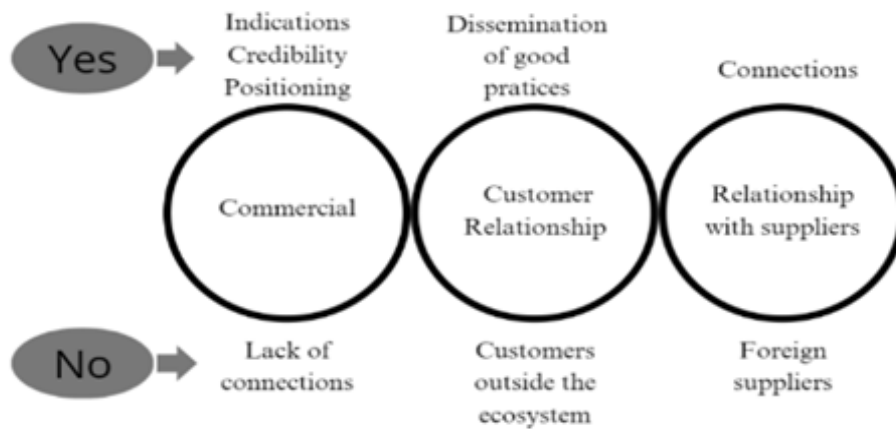
The absence of stronger intermediation mechanisms within the ecosystem increases coordination and search costs, as startups must independently identify and approach potential partners. In terms of Transaction Cost Economics, weak connectivity among actors limits the ecosystem’s ability to reduce transaction costs associated with partner identification and contract negotiation.

The relationship with the client, according to the interviewees’ perception, does not receive the action of the innovation ecosystem; one of the main reasons lies in the fact that they have several clients outside the Northern Rio Grande do Sul, as said by the founding partner of the startup 3: “I also think not much because our customers are all away. Of course, it happens.

You network by being part of the ecosystem, and these people indirectly connect you with potential customers. However, I do not bring clients directly into the ecosystem.” Except when there is the dissemination of good practices, such as creating a customer-focused culture, which can be disseminated throughout the innovation ecosystem through materials, lectures, and programs focused on the area, without receiving direct action. This finding suggests that ecosystem participation does not significantly affect post-contractual transaction costs, such as monitoring and adaptation costs in client relationships. While the ecosystem may contribute to initial legitimacy, ongoing customer management remains largely internal to the firm. Regarding relationships with suppliers, most interviewees stated they need help understanding the role of the innovation ecosystem in the Northern Rio Grande do Sul, as suppliers are foreign. From a Transaction Cost Economics standpoint, when suppliers are external and geographically distant, ecosystem participation has limited influence on reducing transaction costs. Search, negotiation, and enforcement costs remain predominantly shaped by market mechanisms rather than by regional relational structures.

Figure 3 helps to understand the main reasons presented by the founding partners interviewed:

**Figure 3 - Reasons for the performance or nonperformance of the innovation ecosystem given the transaction capacity**



SOURCE: ELABORATED BY THE AUTHORS (2024).

Some interviewees required assistance in determining whether they understood the activities within the blocks presented, as they were unfamiliar with the differences between them, particularly between the commercial and customer relationship blocks. This conceptual ambiguity has important implications for the regional innovation ecosystem. From a Transaction Cost Economics perspective, the inability to clearly distinguish between commercial activities and customer relationship management may lead to higher transaction costs. When transactional processes are poorly structured, startups may face greater difficulty identifying appropriate partners, negotiating contractual terms, and monitoring the fulfillment of agreements. Such ambiguity increases uncertainty and coordination problems, limiting the ecosystem's capacity to reduce opportunism and enhance economic efficiency.

### Opportunity and challenges: managerial implications

This section consolidates the opportunities and challenges identified across the dataset, integrating qualitative and quantitative findings to provide a coherent analytical interpretation. The innovation ecosystem in Northern Rio Grande do Sul faces challenges and opportunities that can be leveraged to promote sustainable development. Table 5 summarizes interviewees' suggestions for actions to enhance transactions between ecosystem members.

**Table 5-The innovation ecosystem can promote actions to encourage transactions between network members**

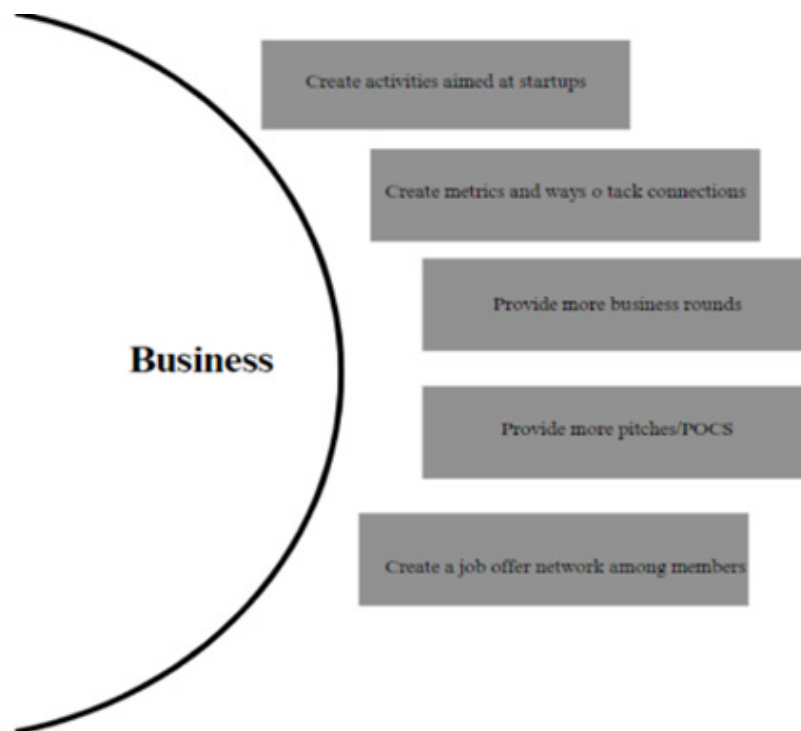
Category	Excerpts from interviews	Startup	Movement
Opportunities and Challenges	The ecosystem would benefit from initiatives that foster connections, track outcomes via a virtual platform or dashboard, and prioritize key actors to strengthen overall engagement.	Startup 2	Movement A
Opportunities and Challenges	This exchange, like business rounds and pitches, can generate some synergy. This is essential.	Startup 3	Movement A
Opportunities and Challenges	Currently, POCs and business round opportunities are limited, but bringing people together is a positive start. More activities should target a broader range of startups, not just specific challenges, and the ecosystem should better leverage local talent alongside external participants.	Startup 5	Movement A
Opportunities and Challenges	Working as a group allows for better organization of suppliers and collective negotiation of services, thereby reducing costs. Another benefit is sharing successful cases from other regions and applying them locally.	Startup 7	Movement A
Opportunities and Challenges	Startups often spend significant time seeking investment, but the ecosystem currently lacks clear examples of successful funding that could inspire other companies to take similar steps.	Startup 10	Movement A
Opportunities and Challenges	It is necessary to have an independent commission that consults with all these groups within these cells. If we keep closing boxes into bubbles, we will never escape this bubble.	Startup 1	Movement A
Opportunities and Challenges	Information-sharing meetings could strengthen connections and business networks. Ecosystems take time to mature, as demonstrated by Vértice, and collaboration benefits all parties involved. Opportunities to connect with Movement B have been limited, and the local innovation ecosystem does not fully reach entrepreneurs.	Startup 6	Movement B

Category	Excerpts from interviews	Startup	Movement
Opportunities and Challenges	The PUC ecosystem in Curitiba maintains a consistent schedule of events, including informal gatherings such as monthly beer-and-pizza meetings for CEOs. These events foster idea exchange, business connections, and potential partnerships, highlighting the importance of regular networking for companies..	Startup 8	Movement B
Opportunities and Challenges	People in the ecosystem often focus on recruiting others rather than seeing potential partners who could mutually support clients or companies. This approach could be enhanced to foster greater collaboration.	Startup 9	Movement B

SOURCE: ELABORATED BY THE AUTHORS (2024)

It is noted that the excerpts can be categorized from two perspectives: Relationships and business. To better visualize the data, Figures 4 and 5 are presented, which demonstrate the main actions suggested within their subcategories:

**Figure 4 - Suggested actions from the perspective of promoting more business**

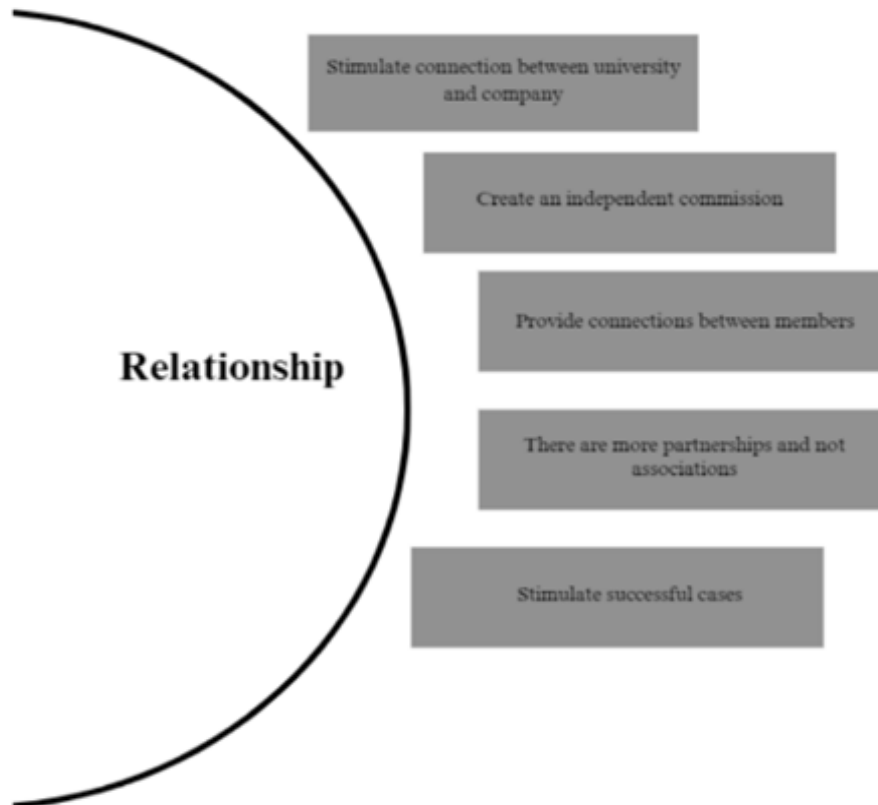


SOURCE: ELABORATED BY THE AUTHORS (2024)

Analyzing the suggested actions to encourage more business, the main objective is to disseminate and create activities, including the participation of more agents who promote startups across all areas. In Figure 5, actions are listed under the perception of fostering and engaging existing relationships.

Furthermore, it is clear that in the Business subcategory, pitches, POC, and business rounds are suggestions that interviewees report are missing within the innovation ecosystem of the Northern Rio Grande do Sul, according to an excerpt from the founding partner of the startup 5: "Doing it, we call it POCs, too. This is being done a little. Let us make more relationships like this. Of business round possibilities. It is still not coming on that strongly. It is still a bit of an organizational moment." In this sense, we can quote another excerpt from the co-owner of Startup 3: "I think that this exchange, this type of exchange, like business rounds, pitches, can generate some synergy, right? I think this is important."

**Figure 5 - Suggested actions from the perspective of fostering more relationships**



SOURCE: ELABORATED BY THE AUTHORS (2024).

The possibility of creating monitoring and metrics that verify the results of the connections generated within the innovation ecosystem benefits the actors involved. It structures the processes in this environment more.

The founding partner of Startup 7 suggests that one benefit of working as a group is better supplier organization. If we need consultancies, training, software, and tools, and negotiate this as a group, we tend to get access to a smaller investment. This suggestion highlights the need for collaboration, in which actors use services from other actors, thereby creating a more interconnected network.

Within the business subcategory, it is possible to implement more actions aimed at local startups, as the founding partner of Startup 5 explained: "I think they could have more activities aimed at more startups. Not just for their particular challenges, right? I think they are still very focused on their challenges. Take advantage of those who are here in Passo Fundo. Because I already know of startups and people from other cities who have brought companies here, etc. Sometimes they forget that we have great talent here. So, we should also look at what is great about us here, right?".

When examining the relationship subcategory, it becomes clear that interviewees expect the innovation ecosystem to foster connections among all network actors, including companies, educational institutions, and public authorities. Thus, it is possible to see this in the excerpt from the interview with the founding partner of Startup 6: "It is more in the sense that we see that an ecosystem is sufficient for the size of the city and that if people put aside this rivalry that exists, everyone would win, you know. I would love to connect with people in the B Movement, but I have not had that opportunity yet. I think Passo Fundo's innovation ecosystem does not reach entrepreneurs, understand."

There is a need to create a commission independent of all current movements, which is responsible for uniting the various actors in the innovation ecosystem, according to an excerpt from the interview with the founding partner of the startup 4: "It is necessary to have an independent commission that talks to all these groups in these cells. If we start to close, if we close some boxes into bubbles, we will never get out of this bubble".

Furthermore, suggestions are indicated, such as a more remarkable presentation of success cases in the city, according to the excerpt from the founding partner of Startup 10: "It is making, I think, happen and having some real examples. So, I will take the issue of startups: they spend a significant part of their lives or history looking for investment, whether it is a small investment from an angel or a substantial investment that goes to waste. Today, we do not have any example in Passo Fundo where this has happened, or those with the ecosystem are not used to creating an example that could encourage other companies to undertake".

There is room to improve relationships between the innovation ecosystem and startups, treating them as partners rather than just recruits. As noted by Startup 9's founding partner, the focus often remains on joining the ecosystem rather than fostering mutually beneficial collaborations.

From a Transaction Cost Economics perspective (Williamson, 1993), these proposed actions can be interpreted as mechanisms to enhance economic efficiency within the regional ecosystem. The organization of suppliers and collective negotiations reduce search and bargaining costs, while structured pitch sessions, POCs, and business rounds function as coordination devices that decrease information asymmetry and accelerate contract formation. Monitoring tools and performance dashboards can further reduce uncertainty and opportunism by increasing transparency

and accountability among actors. Therefore, beyond strengthening relationships, these initiatives directly reduce transaction costs and optimize the process of bringing innovation to market.

## CONCLUSION

The innovation ecosystem in Northern Rio Grande do Sul is evolving but still in a consolidation phase. The interviewees' understanding aligns with Walrave (2018), who views it as a network of interdependent actors co-creating value, while also recognizing the public sector's role as described in the Triple Helix model, which emphasizes collaboration between universities, companies, and the government (Etzkowitz, 2000).

Furthermore, interviewees recognize the importance of actors working together, corroborating Granstrand and Holgersson (2020), who systematically reviewed 120 publications on the definitions of innovation ecosystems. In these definitions, the only component that appeared as the set of actors was collaboration; the second most common element was collaboration, which appeared in 16 definitions.

By recognizing that the innovation ecosystem in the Northern Rio Grande do Sul is evolving to reach maturity, they realize that there is room for improvements in the sense of unity; throughout the results, it can be noted that there is a “bubble” that needs to be “pierced” recognizes that there is a difficulty in the interaction of the three actors, highlighting the need to create intermediary organizations to unite them. When examining the proposed opportunities and challenges, interviewees offer suggestions in two additional subcategories: Business and Relationships. They propose stronger connections and unity to facilitate business and drive regional development.

The innovation ecosystem highlights the need for improvement in transactional areas, including customer and supplier relationships. While referrals help build credibility and positioning for startups, transaction capacity encompasses the skills, routines, and knowledge necessary to market and deliver products or services effectively, including sales, marketing, customer relations, and supplier management (Zawislak et al., 2012).

This study focused on startups associated with Movements A and B, providing valuable insights into the dynamics of these specific initiatives. Future studies could expand the analysis to include other regions of the state or examine startups not associated with specific initiatives, thereby providing a more comprehensive view of the innovation ecosystem in Rio Grande do Sul. Such an approach would help to generalize findings and explore broader patterns of innovation and collaboration.

One limitation involves the interviewees' need to understand transaction capacity and its areas. The interview was more focused on what the innovation ecosystem could do in general to support everyone's evolution, rather than on the interviewees' transaction capacity. As a suggestion for future studies, this study can be applied to other actors in the innovation ecosystem, such as more mature companies and educational institutions.

To create a more robust and inclusive ecosystem, involving the community and creating spaces for dialogue and collaboration between different actors is essential.

This could include the creation of an independent commission that brings together representatives from various sectors and groups in the city. Furthermore, there must be a long-term commitment to developing the innovation ecosystem in Northern Rio Grande do Sul, with investments in infrastructure, acceleration, and incubation programs, as well as other initiatives to boost development and innovation in the area. The government is also a fundamental player in leveraging the topic in municipalities (through public policies) and in promoting the role of universities in debates and solutions to real problems in society and cities.

## REFERENCES

- Adner, R. (2006). Match your innovation strategy to your innovation ecosystem. *Harvard Business Review*, 84(4), 98–106.
- Ahn, S., Kim, K.-S., & Lee, K.-H. (2022). Technological capabilities, entrepreneurship and innovation of technology-based start-ups: The resource-based view. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), 156. <https://doi.org/10.3390/joitmc8030156>
- Alves, A. C., Barbieux, D., Reichert, F. M., Tello-Gamarra, J., & Zawislak, P. A. (2017). Innovation and dynamic capabilities of the firm: Defining an assessment model. *Revista de Administração de Empresas*, 57(3), 232–244. <https://doi.org/10.1590/S0034-759020170304>
- Audretsch, D. B., Belitski, M., Caiazza, R., & Siegel, D. (2023). Effects of open innovation in startups: Theory and evidence. *Technological Forecasting and Social Change*, 194, 122572. <https://doi.org/10.1016/j.techfore.2022.122572>
- Bardin, L. (2016). *Análise de conteúdo* (3ª ed.). Edições 70.
- Blank, S., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. K&S Ranch Publishing Division.
- Associação Brasileira de Startups. (2022). *Mapping of startups Brazil*. <https://abstartups.com.br/>
- Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.
- Dullius, A. C., & Schaeffer, P. R. (2016). Innovation capabilities in startups: Contributions to a growth trajectory. *Revista Alcance*, 23(1), 34–50. <https://doi.org/10.14210/alcance.v23n1.p034-050>
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From national systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109–123. [https://doi.org/10.1016/S0048-7333\(99\)00055-4](https://doi.org/10.1016/S0048-7333(99)00055-4)
- Fukugawa, N. (2018). Is the impact of an incubator's ability on incubation performance contingent on technologies and life cycle stages of startups? Evidence from Japan. *International Entrepreneurship and Management Journal*, 14(2), 457–478. <https://doi.org/10.1007/s11365-017-0468-1>
- Gomes, L. A. V., Facin, A. L. F., Salerno, M. S., & Ikenami, R. K. (2018). Unpacking the innovation ecosystem construct: Evolution, gaps, and trends. *Technological Forecasting and Social Change*, 136, 30–48. <https://doi.org/10.1016/j.techfore.2016.11.009>
- Granstrand, O., & Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation*, 90, 102098. <https://doi.org/10.1016/j.technovation.2019.102098>
- Marcon, A., & Ribeiro, J. L. D. (2021). How do startups manage external resources in innovation ecosystems? A resource perspective of startups' lifecycle. *Technological Forecasting and Social Change*, 171, 120965. <https://doi.org/10.1016/j.techfore.2021.120965>
- Marcon, A., Ribeiro, J. L. D., Olteanu, Y., & Fichter, K. (2024). How the interplay between innovation ecosystems and market contingency factors impacts startup innovation. *Technology in Society*, 76, 102424. <https://doi.org/10.1016/j.techsoc.2023.102424>
- Mendes França, M., & Amorim, D. A. (2023). The importance of accounting in startup companies. *Management, Technology and Sciences*, 12(39), 15–28.
- Mercan, B., & Götkaş, D. (2011). Components of innovation ecosystems: A cross-country study. *International Research Journal of Finance and Economics*, 76, 102–112.

- Noelia, F. L., & Rosalia, D. C. (2020). A dynamic analysis of the role of entrepreneurial ecosystems in reducing innovation obstacles for startups. *Journal of Business Venturing Insights*, 14, e00192. <https://doi.org/10.1016/j.jbvi.2020.e00192>
- Nogueira, V. S., & Oliveira, C. A. A. (2015). Causes of mortality among Brazilian startups. *Caderno de Inovação e Empreendedorismo*, 9(12), 26–33.
- Organisation for Economic Co-operation and Development (OECD). (2005). *Oslo manual: Guidelines for collecting and interpreting innovation data* (3rd ed.). Finep. [http://www.finep.gov.br/images/a-finep/biblioteca/manual\\_de\\_oslo.pdf](http://www.finep.gov.br/images/a-finep/biblioteca/manual_de_oslo.pdf)
- Pimenta, E. G., & Lana, H. A. (2020). Startups, acceleration, incubation, and entrepreneurial ecosystem. *Revista Vox*, 11, 162–195.
- Reichert, F., Camboim, G. F., & Zawislak, P. A. (2015). Innovation capabilities and trajectories of Brazilian companies. *Revista de Administração Mackenzie*, 16(5), 161–194. <https://doi.org/10.1590/1678-69712015/administracao.v16n5p161-194>
- Schumpeter, J. A. (1982). *A teoria do desenvolvimento econômico*. Abril Cultural.
- Secretaria da Inovação, Ciência e Tecnologia do Rio Grande do Sul. (2022). *Rio Grande do Sul é 1º em inovação no Brasil*.
- Shipilov, A., & Gawer, A. (2020). Integrating research on interorganizational networks and ecosystems. *Academy of Management Annals*, 14(1), 92–121. <https://doi.org/10.5465/annals.2017.0094>
- Skala, A. (2019). The startup as a result of innovative entrepreneurship. In A. Skala (Ed.), *Digital startups in transition economies: Challenges for management, entrepreneurship, and education* (pp. 1–40). Springer. [https://doi.org/10.1007/978-3-030-01500-8\\_1](https://doi.org/10.1007/978-3-030-01500-8_1)
- Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy. *Research Policy*, 15(6), 285–305. [https://doi.org/10.1016/0048-7333\(86\)90027-2](https://doi.org/10.1016/0048-7333(86)90027-2)
- Walrave, B., Talmar, M., Podoyntsyna, K. S., Romme, A. G. L., & Verbong, G. P. (2018). A multi-level perspective on innovation ecosystems for path-breaking innovation. *Technological Forecasting and Social Change*, 136, 103–113. <https://doi.org/10.1016/j.techfore.2017.04.011>
- Williamson, O. E. (1993). Transaction cost economics and organization theory. *Industrial and Corporate Change*, 2(2), 107–156. <https://doi.org/10.1093/icc/2.2.107>
- Zawislak, P. A., Alves, A. C., Tello-Gamarra, J., Barbieux, D., & Reichert, F. M. (2012). Innovation capability: From technology development to transaction capability. *Journal of Technology Management & Innovation*, 7(2), 14–27. <https://doi.org/10.4067/S0718-27242012000200002>