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FELIPE DE MATTOS ZARPELON

INSTITUTIONAL WORK PRACTICES TO FOSTER COLLABORATION IN INNOVATION ECOSYSTEMS:

The cases of Sophia Antipolis and Tecnosinos

Porto Alegre

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A dissertation presented as a partial requirement to obtain the title of Doctor of Business Administration from the Graduate Program in Administration of the UNISINOS University and Doctor of Management Science at the University of Poitiers.

Director: Prof. Dr. Alsones Balestrin

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Approved on June 15, 2020.

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"We are what we do, specially what we do to change what we are"

(Galeano, 2000)

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ABSTRACT

Institutional approaches support a significant perspective shift in the field of studies of innovation. From a firm-centered tradition discussing innovative internal capabilities, the innovation literature comes to recognize an open process, primarily based on interorganizational relationships. Under this perspective shift, the innovation ecosystem emerges as a concept capable of relating innovative performance to the set of organizational actors and their interactions in a context of cultural, cognitive, and normative elements. Within the limits of the innovation ecosystem, collaboration, as a free, recurring, and productive interaction, gains prominence as the central dynamic for technological development. However, collaborative behavior requires the sharing of structures, norms, and culture, and its development in the environment of innovation ecosystems still instigates further analysis. The problem that this research sought to answer, therefore, considers the dynamics of fostering collaboration in innovation ecosystems. The articulation between institutional work – perspective at the agency of the individual in the institutionalization process – and institutional logics – perspective at the dimensions that support the institution – was used as the theoretical lens of this dissertation. In order to achieve the research objectives, a multiple case study was carried out covering the innovation ecosystems of Sophia Antipolis, in France, and Tecnosinos, in Brazil. As a result, the research brings a theoretical-conceptual framework and six propositions that support the thesis that *relational assets ease the implementation of institutional work practices that foster collaboration as an institutionalized organizational behavior in innovation ecosystems.* The theoretical contributions of this dissertation inform the literature on the propensity of reaching results from the inclusion of the relational level of analysis as a bridge capable of integrating institutional work and institutional logics. This dissertation brings managerial contributions insofar as it informs public managers, entrepreneurs, and researchers inserted in innovation ecosystems on ways to stimulate and take advantage of collaborative initiatives. Finally, this dissertation sets suggestions for future studies.

Key-words: Innovation Ecosystems; Collaboration; Institutional Work; Institutional Logics; Relational Assets; Sophia Antipolis; Tecnosinos.

RESUMO

Abordagens institucionais embasam uma mudança significativa na perspectiva de estudos sobre inovação. De uma tradição centrada na firma discutindo capacidades inovativas internas, a literatura em inovação passa a reconhecer um processo aberto, primariamente baseado em relações interorganizacionais. Nesta mudança de perspectiva, o ecossistema de inovação surge como conceito capaz de relacionar a performance inovativa ao conjunto de atores organizacionais e suas interações em um contexto de elementos culturais, cognitivos e normativos. Dentro dos limites do ecossistema de inovação, a colaboração, como interação livre, recorrente e produtiva, ganha proeminência como principal dinâmica para o desenvolvimento tecnológico. No entanto, o comportamento colaborativo requer o compartilhamento de estruturas, normas e cultura, e seu desenvolvimento no ambiente de ecossistemas de inovação ainda instiga aprofundamento. A problemática que esta pesquisa buscou responder recai, portanto, sobre a dinâmica de facilitação da colaboração em ecossistemas de inovação. A articulação entre trabalho institucional – perspectiva da agência do indivíduo no processo de institucionalização – e as lógicas institucionais – perspectiva sobre as dimensões que sustentam a instituição – foi empregada como lente teórica desta tese. Para que os objetivos da pesquisa fossem alcançados, foi realizado um estudo de casos múltiplos sobre os ecossistemas de inovação de Sophia Antipolis, na França, e Tecnosinos, no Brasil. Como resultado, a pesquisa traz um framework teórico-conceitual e seis proposições que sustentam a tese de que *ativos relacionais facilitam a implementação de práticas do trabalho institucional que fomentam a colaboração como um comportamento organizacional institucionalizado em ecossistemas de inovação*. As contribuições teóricas desta tese informam a literatura sobre resultados a partir da inclusão do nível de análise relacional como uma ponte capaz de integrar trabalho institucional e lógicas institucionais. Esta tese traz contribuições gerenciais na medida em que informa gestores públicos, empreendedores e pesquisadores inseridos em ecossistemas de inovação sobre formas de estimular e aproveitar iniciativas de colaboração. Por fim, limitações e indicações para estudos futuros são produzidas.

Palavras-chave: ecossistemas de inovação; colaboração; trabalho institucional; lógicas institucionais; ativos relacionais; Sophia Antipolis; Tecnosinos

RÉSUMÉ

Les approches institutionnelles soutiennent un changement de perspective significatif dans le domaine des études sur l'innovation. Issu d'une tradition centrée sur l'entreprise discutant des capacités internes innovantes, la littérature sur l'innovation en vient à reconnaître un processus ouvert, principalement basé sur des relations interorganisationnelles. Dans ce changement de perspective, l'écosystème de l'innovation apparaît comme un concept capable de relier la performance innovante à l'ensemble des acteurs organisationnels et à leurs interactions dans un contexte d'éléments culturels, cognitifs et normatifs. Dans les limites de l'écosystème de l'innovation, la collaboration, en tant qu'interaction libre, récurrente et productive, gagne en importance en tant que dynamique centrale du développement technologique. Cependant, le comportement collaboratif nécessite le partage des structures, des normes et de la culture, et son développement dans l'environnement des écosystèmes d'innovation suscite encore une analyse plus approfondie. Le problème auquel cette recherche a cherché à répondre tient donc à la dynamique de promotion de la collaboration dans les écosystèmes d'innovation. L'articulation entre le travail institutionnel – perspective sur l'agence de l'individu dans le processus d'institutionnalisation – et les logiques institutionnelles – perspective sur les dimensions qui soutiennent l'institution – a été utilisée comme lentille théorique de cette thèse. Afin d'atteindre les objectifs de recherche, une étude de cas multiple a été réalisée sur les écosystèmes d'innovation de Sophia Antipolis, en France, et de Tecnosinos, au Brésil. Comme résultat, la recherche apporte un cadre théorique et conceptuel et six propositions qui soutiennent la thèse selon laquelle *les actifs relationnels facilitent la mise en œuvre de pratiques de travail institutionnelles qui favorisent la collaboration en tant que comportement organisationnel institutionnalisé dans les écosystèmes d'innovation*. Les apports théoriques de cette thèse informent la littérature sur la propension à atteindre les résultats de l'inclusion du niveau d'analyse relationnel comme pont capable d'intégrer le travail institutionnel et les logiques institutionnelles. Cette thèse apporte des contributions managériales dans la mesure où elle informe les gestionnaires publics, les entrepreneurs et les chercheurs insérés dans les écosystèmes d'innovation sur les moyens de stimuler et de tirer parti des initiatives collaboratives. Enfin, cette thèse propose des suggestions pour des études futures.

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ACIST-SL	Associação Comercial, Industrial, de Serviços e Tecnologia de São Leopoldo
CASA	Communauté d'Agglomeration Sophia Antipolis
CCI	Chambre de Commerce et d'Industrie
CNRS	Centre National de la Recherche Scientifique
IASP	International Association of Science Parks and Areas of Innovation
ICTs	Information and Communication Technologies
INRA	Institut National de la Recherche Agronomique
INRIA	Institut National de Recherche en Informatique et en Automatique
ITT	Instituto Tecnológico
PACA	Provence-Alpes-Cotê d'Azur
Pole SCS	Pole Solutions Communicantes Sécurisées
R&D	Research and Development
REGINP	Rede Gaúcha de Ambientes de Inovação
SYMISA	Syndicat Mixte de Sophia Antipolis
UNISINOS	Universidade do Vale do Rio dos Sinos

SUMMARY

INTRODUCTION

The organization does not detach from the surrounding context. Its action stems from responses to external and internal pressures that define acceptable patterns of behavior. Based on this observation, organizational institutionalism has developed as one of the pillars of organizational studies in the 20th century (Meyer & Rowan, 1977; DiMaggio & Powell, 1983). Institutions, which are as elements of social life capable of providing templates for action, cognition and emotion (Lawrence, Suddaby & Leca, 2011), lead to patterns of behavior capable of defining the organization's competitiveness, technological development patterns, and aspects of organizational behavior, such as the propensity for collaboration.

Organizational institutionalism as a theoretical framework helps to understand a diversity of fields of study, such as corporate social responsibility (Matten & Moon, 2008; Bice, 2017), internationalization (Hotho & Pedersen, 2012; Kostova et al., 2019), interorganizational relationships (Oliver, 1990; Gulati & Sytch, 2007), entrepreneurship (Jennins et al., 2013; Estrin & Mickiewicz, 2011), to name a few examples. The field of studies on innovation is no different – it relies on the institutional approach, among other perspectives, to promote a relevant change in the understanding of the driving elements of innovation. From a firm-centered tradition discussing innovative internal capacities (Dahlman, Ross-Larson & Westphal, 1987; Lall, 1992), the innovation literature embraces an open process (Chesbrough, 2006), primarily based on interorganizational relationships (Hui, Fonstad & Beath, 2008). Among the implications of this change is the increasing interest in the effect of the environment on innovation performance through the understanding of innovation ecosystems (Adner, 2006; Carayannis & Campbell, 2009).

Literature understands the innovation ecosystem as a distinguishable set of organizational actors, in addition to cultural, cognitive, and normative elements that ease the value creation in a given context (Gomes et al., 2016; Thomas & Autio, 2012; Adner & Kapoor, 2016). The concept of innovation ecosystem, although receiving criticism regarding the appropriation of constructs from the field of knowledge of biology (Oh et al., 2016), seeks to express the role of interaction between organizations – academia, industry, government and society – and contextual elements – culture, legislation, public policies, and behavior – to explain the innovative performance of a given location (Hwang & Horowitt, 2012; Brusoni & Prencipe, 2013; Adner, 2016). The

concept also includes the idea of a network of interconnected organizations that are related to or operate around a platform – *i.e.,* focal organization, software, organizational hub – incorporating both production activities (upstream) and users (downstream), and creating value through innovation (Autio & Thomas, 2014).

The actors embedded within the innovation ecosystem interact and result representing different roles inside the innovative process (Song, 2016). It is worth mentioning the diversity and pluralism of cultural and cognitive characteristics of these actors represented by universities, small and medium-sized enterprises (SME's), large corporations (Carayannis & Campbell, 2009), governmental, non-governmental and class entities (Schwartz & Bar-El, 2015).

Ecosystems initially emerge from the empirical literature in the 1990s (Moore, 1993) and only recently have been discussed in scientific journals of strategy and innovation (Adner e Kapoor, 2010; Pierce, 2009; Teece, 2007; Autio & Thomas, 2014). With the increasing interest of scholars on innovation ecosystems, a broad research agenda portrays concerns about the development of empirical and theoretical research on the theme (Durst & Poutanen, 2013).

Innovation ecosystems necessarily comprise universities and research centers as structures for knowledge development (Thomas & Autio, 2012). Anyhow, even in innovation ecosystems where a variety of actors embrace common goals, there exist concerns about the implementation of knowledge to solve issues on markets (Adner, 2006; Mercan & Goktas, 2011) or demands emerging from society (Carayannis & Campbell, 2010).

Nevertheless, innovation ecosystems portray a pool of knowledge construction with the participation of culturally and cognitively diverse actors (Hwang & Horowitt, 2012). The complexity of fostering a purposeful and productive integration among actors with cultural and cognitive diversity requires efficient collaboration schemes (Song, 2016). Fostering and supporting collaborative schemes, however, still puzzle the innovation ecosystem literature (Carayannis & Campbell, 2009; Jimenez, 2018).

Free, recurrent and purposive interaction inside the boundaries of an innovation ecosystem seems to tackle concerns highlighted in the literature – *i.e.,* integration between entrepreneurial and innovative ecosystems (Dubina et al., 2017), creation of social value in innovation ecosystems (Fulgencio, 2017; Carayannis & Campbell, 2010), network effect on technological development (Carayannis, Campbell & Rehman, 2016). Recurrent and productive interaction among structures of knowledge

creation and industries might bridge over the difficulties to find the implementation of knowledge to address market needs – *i.e.*, outsourcing R&D, financing innovation, human capital demands (Mercan & Goktas, 2011). Plus, collaboration among the same knowledge creation structures and industries to the local community is a path to deliver resolutions to community needs - *i.e.,* transportation, migration, leisure (Carayannis & Campbell, 2010; Dubina et al., 2017).

Collaboration is itself in the core concept of the innovation ecosystem (Song, 2016). Free, recurrent, and purposive interaction supports the exchange of knowledge (Schwartz & Bar-El, 2015) and the joint solution of problems (Adner & Kapoor, 2010). The occurrence of collaboration among entrepreneurs, academics, public managers and other actors of an innovation ecosystem (Song, 2016) depends on the existence of structural and cultural elements such as infrastructure, reciprocity, and trust (Rohrbeck, Hölzle & Gemünden, 2009; Adner & Kapoor, 2010). Although the definition of these elements has been a concern in literature, it seems still incipient how they develop and gets support throughout time, and especially the role of each actor in fostering and sustaining collaboration inside the innovation ecosystem boundaries (Hwang & Horowitt, 2012).

The analysis of collaboration in innovation ecosystems requires theoretical lenses capable of encompassing both structural and cultural elements regarding the organizational option to collaborate (Adner & Kapoor, 2010; Autio & Thomas, 2014). For this reason, perspectives of organizational institutionalism that consider organizational behavior as a response to normative, cognitive and regulatory pressures (DiMaggio & Powell, 1983) are adopted by the literature in innovation ecosystems (Autio & Thomas, 2014; Thomas & Autio, 2014; Gibson, Foss & Hodgson, 2014). Under the organizational institutionalism approach, innovation ecosystems parallel *organizational fields* – organizations that jointly shape a recognized area of institutional life: suppliers, resources, producers, consumers, regulatory agencies, and other organizations of a given industry (DiMaggio & Powell, 1983). This way, the ecosystem as a theoretical construct is analogous to the organizational field reporting its actors, logic, and institutional governance structures (Thomas & Autio, 2014).

Research Question

Neo-institutional theory sustains the process of institutionalization as an outcome of increasing acts of organizational constraining to sturdy social and cultural structures (Jepperson, 1991). The analysis is primarily top-down and deterministic (Willmott, 2011). Organizations accept normative, cognitive, and regulatory pressures in pursuit of legitimacy. As an outcome, they act similarly through the process of isomorphism (DiMaggio & Powell, 1983). Then, if the analysis of fostering collaboration inside innovation ecosystems boundaries predicts the active participation of its supporting actors, a voluntaristic and bottom-up perspective might be useful.

From a different standpoint of the neoinstitutional theory, institutional work brings the analysis to the level of the agency, where the individual or collective actors take charge of practices responsible for creating, maintaining, or disrupting institutions (Lawrence & Suddaby, 2006). The notion of institutional work makes it possible to envisage a more significant contribution of neo-institutionalism to strategy. While the strategy aims to analyze the acquisition of sustainable competitive advantage, the notion of institutional work allows the study of strategies to align the very structures that regulate competition with the interests and values of certain actors (Slimane & Leca, 2010). For instance, through institutional work, an organization might apply practices of political persuasion (Lawrence & Suddaby, 2006) to influence the regulation of legal frameworks that might sustain its competitive advantage.

Institutional work enables the analysis of the creation and maintenance of institutional frameworks through practices undertaken by a diversity of actors in the organizational field (Lawrence & Suddaby, 2006). Moreover, institutional work allows the identification of interrelationships and interplays between practices conducted in the organizational field (Empson, Cleaver & Allen, 2013; Lawrence, Suddaby & Leca, 2009). Once the literature has mapped structural and cultural dimensions that enable collaboration in innovation ecosystems (Thomas & Autio, 2012; Hwang & Horowitt, 2012), and it has also mapped the network of organizational actors that support the ecosystem (Fulgencio, 2017; Adner & Kapoor, 2010), it is opportune to conduct the analysis of the agency of these actors in the field. Thus, institutional work portrays a justified lens of analysis.

Although this is not particularly novelty, since DiMaggio (1988) calls attention to the capacity of individuals to act as institutional entrepreneurs, the focus of the

institutional work perspective is on daily practices. Institutions are outcomes of the agency of individuals acting routinely and ordinarily (Lawrence, Suddaby & Leca, 2009).

Literature highlights three key elements of institutional work from a theoretical perspective: institutions, actors, and practices (Lawrence, Suddaby & Leca, 2009). The definition of institutions under this perspective comes from its neo-institutionalist tradition, representing those elements of social life with the ability to affect the behavior and belief of individuals and collective actors (Lawrence, Suddaby & Leca, 2009). Actor, in this perspective, is the individual or collective agent (Lawrence, Suddaby & Leca, 2011) capable of defining the trajectory of an institution (Styhre, 2014). As a central element of institutional work, practices are actions endowed with intentionality and temporality (Willmott, 2011). These actions require the physical and mental effort of actors intending to create, maintain, or disrupting institutions (Lawrence & Suddaby, 2006). The efforts lead to the dynamics of shaping every institution (Sthyre, 2014), so their impact on the development and maintenance of organizational behavior patterns within the organizational field, such as collaboration inside innovation ecosystems, seems to be no different. Then, the research question that encouraged this dissertation stands:

How do institutional work practices foster collaboration in innovation ecosystems?

Institutional work argues that practices are agency outcomes of actors embedded in a set of cultural and cognitive patterns (Lawrence, Sudabby & Leca, 2009). Institutional work practices respond to the context in which the actors embed; thus, practices for institutionalizing collaboration in a given innovation ecosystem, will not necessarily be observed in another innovation ecosystem. For this reason, under the ontology of critical realism (Welch et al., 2011), a multiple case study was carried out aiming at resolving the research question. Although it diminishes the capacity to generalize findings, the research gains depth and explainability.

The research analyzed two cases, first separately and then comparatively. Sophia Antipolis, in France, and Tecnosinos, in Brazil, were the innovation ecosystems selected for analysis. Different cultural and regulatory contexts surround these innovation ecosystems. Also, even though their constituent organizations share the

same objective of shaping the region as a technological development pole nationally and internationally acknowledged, their governance and relationship structures are different. Similarities and discrepancies allowed this dissertation to achieve contextualized causal explanation.

The research applied qualitative techniques for data collection and analysis. The empirical database comprised the transcripts of thirty-five semi-structured interviews with representatives of organizational actors acknowledged by their efforts to foster collaboration inside the innovation ecosystems. The empirical database has also considered excerpts of documentary data, and non-participant observation. The data were analyzed according to their content.

In addition to the question that guided this research, it is worth establishing the general objective, subdivided into four specific objectives.

Objectives

The objectives of this dissertation split into general and specifics.

General objective

Propose a theoretical framework regarding the promotion of collaboration inside innovation ecosystem boundaries through practices of institutional work.

Specific objectives

a) Characterizing collaboration inside the innovation ecosystem;
b) Describing filed level supporting elements for collaboration inside the innovation ecosystem;
c) Describing institutional work practices endeavored by organizational actors in fostering collaboration inside the innovation ecosystem;
d) Identifying relational elements that might ease the implementation of institutional work practices inside the innovation ecosystem.

Research Justification

The justifications for carrying out this research admit opportunities for contributions to both theoretical and managerial literature. The integration between two perspectives of organizational institutionalism, aligned with the analysis at multiple levels, showed the path to the theoretical contributions of this dissertation. Also, the centrality of collaboration in discussions on innovation ecosystems opens the way for the advancement of research from a managerial point of view.

Literature has consistently evolved from the seminal text (Lawrence & Suddaby, 2006) from the theoretical perspective of institutional work (Lawrence, Leca & Zilber, 2013; Zarpelon et al., 2019). The advances demonstrate the typification of institutional work practices (Alvarez, Young & Woolley, 2015; Binz et al., 2016) the assessment of the weight of the actor's social position on its ability to conduct institutional work (Zietsma & Lawrence, 2010; Barin-Cruz et al., 2016), in addition to intentionality and reflexivity of the actor (Bertels, Hoffmann & Dejordy, 2014).

Although the literature manages to evolve to the point of supporting institutional work as an efficient perspective to demonstrate the elucidative potential of organizational institutionalism on organizational studies (Willmott, 2011), some issues still puzzles. The recognition that a plethora of practices occurs simultaneously in the organizational field implies complications from a theoretical point of view. For instance, how to recognize the effectiveness of practices (Lawrence, Leca & Zilber, 2013)? How to comprehensibly organize practices that occur simultaneously and are conducted by different actors (Willmott, 2011)? How do practices relate to each other to the point of being strengthened or weakened (Empson, Cleaver & Allen, 2013; Hallett, 2010)?

The approach with other institutional perspectives, even if it brings complexity to the analysis, may demonstrate a way to answer these issues of institutional work perspective (Zilber, 2013). In this sense, the approach to institutional logics gains prominence (Zilber, 2013; Thornton & Ocasio, 2008). In addition to recognizing the coexistence of institutions in the social context – differing from the excessive focus on the organizational field by the neo-institutionalism – the institutional logics approach argues the existence of three dimensions that help to understand the functioning of institutions: structural, normative and symbolic (Thornton & Ocasio, 2008). The opportunities brought by the approach of the institutional logic approach are twofold:

a) it allows an analysis perspective in multiple levels; b) it allows the typification of institutional work based on its effectiveness.

The theoretical-conceptual foundation of this dissertation also brings the notion of the distributed nature of the agency, as an attempt to unveil the issue regarding the relations among institutional work practices (Empson, Cleaver & Allen, 2013). The literature highlights the opportunity for analysis on the way actors might combine and respond to one another's effort to create, maintain, or disrupt institutions (Lawrence, Suddaby & Leca, 2011).

Thus, this dissertation sustains an analysis of how institutional work practices foster collaboration in innovation ecosystems at three levels: organizational, relational, and field. The analysis at the organizational level allows identifying the diversity of institutional work practices, whereas the field level allows the verification of the effectiveness of these same practices. The analysis at the relational level, however, supports the main theoretical contributions of this dissertation. At the relational level, relational assets emerge as tools that ease the implementation of institutional work practices. The empirical evidence highlights three relational assets: a) connection with external actors; b) collective decision-making schemes; and c) the flow of individuals between organizational structures.

Contributions to the theory are fourfold: a) actors do not perform institutional work practices in isolation, but rely on relational assets to ease the implementation of these actions; b) the relational level of analysis portrays a bridge between a deterministic perspective of the effects of structure and an unrestricted power perspective of the agency of individual or collective actors under these same structures; c) institutional work practices demonstrate how collaboration is institutionalized in the innovation ecosystems; d) dimensions of structure, regulation, and symbology of institutional logics underpin institutionalized collaboration in innovation ecosystems.

The advances over field issues also justify the research. The innovation literature demonstrates the concern with contextual variables in the effectiveness of technological development (Adner, 2006; Carayannis & Campbell, 2009). The recognition of the innovation ecosystem as a metaphor for organizational and non-organizational variables - *i.e.,* culture, norms, regulations, education, security - (Hwang & Horowitt, 2012) seeks to shed light over these concerns. This dissertation intends to

respond to this literature by demonstrating the promotion of collaboration as a factor of innovative performance in innovation ecosystems in different contexts.

With the evolution of information and communication technologies, the awareness for geographical proximity as a competitive differential is questioned (Letaifa & Rabeau, 2013). Thus, questions arise that raise how to make a region a differentiating factor in technological development in a context of diffusion and democratization of ICTs. Developing and maintaining a collaborative environment that might merge local capabilities with global demands seems to respond to these challenges (Hellström, 2015; Su, Zheng & Chen, 2018). This dissertation, therefore, is justified by offering to literature a perspective on practices that support collaborative behavior in innovation ecosystems.

This dissertation, therefore, proposes the thesis that *relational assets ease the implementation of institutional work practices that foster collaboration as an institutionalized organizational behavior inside innovation ecosystems*. This thesis is supported by a theoretical-conceptual framework that demonstrates how institutional work practices – typified according to their impact on dimensions of institutional logics – foster collaboration in innovation ecosystems. The dissertation also presents six propositions that portray the role of relational assets in the effectiveness of institutional work practices.

Dissertation Structure

This dissertation comprises three parts. Part I portrays the literature revision and the theoretical-conceptual basis of the research. Part II presents the research design, with the development of a theoretical-conceptual framework based on the literature review and methodological procedures that guided the research. Finally, part III depicts results and implications.

Two chapters set part I of this dissertation. While chapter 1 portrays organizational institutionalism as the fundamental theoretical literature of this dissertation, chapter 2 depicts a revision concerning the innovation ecosystems literature. Chapter 1 discusses essential constructs – *per se* legitimacy, institution, actors, agency and practices – and recent theoretical perspectives – *per se* institutional logics and institutional work from organizational institutionalism. In addition to the main concepts, chapter 2 highlights collaboration, and its enabling elements.

Part II presents two chapters. Chapter 3 portrays the development of a theoretical-conceptual framework integrating theoretical and empirical literature and three propositions that enlighten causal relations among institutional work practices and dimensions of institutional logics. The framework aligned with the propositions elaborated by the author based on theoretical assumptions, supported the preparation of the field research. Notwithstanding, empirical observations shed light on additional elements and relationships to the framework, which was later discussed in the last chapter of this dissertation. Chapter 4 presents the methodological procedures adopted in this research. The chapter highlights the pragmatic alignment and the integration of qualitative data collection and analysis techniques.

Two chapters also set part III of this dissertation. Chapter 5 presents the individual analysis of each case, highlighting evidence about institutional work practices, in addition to contextual characteristics. Chapter 6 shows the outcomes of the comparative case analysis. This last chapter presents propositions, in addition to the final theoretical-conceptual framework, that support the thesis that *relational assets ease the implementation of institutional work practices that foster collaboration as an institutionalized organizational behavior inside innovation ecosystems*.

Finally, concluding remarks are presented. This session highlights theoretical and empirical contributions, as well as limitations and suggestions for future studies.

1 ORGANIZATIONAL INSTITUTIONALISM

> "The concept of an institution can be thought of as those (more or less) enduring elements of social life that affect the behavior and beliefs of individuals and collective actors by providing templates for action, cognition, and emotion, nonconformity with which is associated with some kind of costs." (Lawrence, Suddaby & Leca, 2011, p.53)

The definition of the institution above is the outcome of a historical construction on the understanding of the effects of cultural and cognitive patterns on organizational action. Organizational institutionalism is one of the relevant theoretical approaches to the construction of the great theoretical framework of studies on organizations (Thornton & Ocasio, 2008; Deephouse & Suchman, 2008).

The institutionalist tradition dates to the late 19th century. Discussions about institutions in economic life firstly appear in the statements of Veblen (1899), where the author makes a counterpoint to classic economic theory emphasizing the mutable, unstable, and temporal aspects of economic reality. Veblen (1899) identifies a stratification in the late 19th-century industrial society. This stratification, however, does not reflect patterns of economic and social utility – *i.e.,* hierarchy based on merit – but rather it reflects patterns brought from previous feudal and tribal societies – *i.e.,* conqueror/conquered relationship. With this, the author identifies a dominant but unproductive social class - *per se* the *leisure class*, away from the means of industrial production, but grounded in the class structure of previous centuries. It demonstrates the deterministic character that cultural and behavioral patterns pervade social contexts over time. Veblen (1899) sheds light on the concept of institutions as prevalent thinking habits in society, and the engine of social evolution.

Several researchers then brought new perspectives over these initial thoughts of institutions. Commons (1936) highlights the role of organizations in economic dynamics in contradiction to what Veblen sustains as an institution. For Commons (1936), the institution is a collective action that controls, releases, and expands individual action. Collective action stands for non-organized habits (in a similar vision to Veblen) or even structured organizations, as family, corporations, commerce associations, unions, or the State.

Another author representing the traditional economic institutionalism is Mitchell (1930). Interested in the dynamics of economic cycles, Mitchell (1930) sustained that

these phenomena would only be reasonably acknowledgeable if institutional structures were well defined, as also its modifications along time were assumed. They were relevant because institutions leverage the human agent in a time-space structure (Mitchell, 1930).

Although relevant to economic knowledge, especially before the II World War, these authors received critiques for being excessively descriptive and lacking on theoretical foundations. Critiques led to a new perspective in economic institutionalism with the work of Coase (1937) regarding the reasons why the firm exists in an economic context. Coase (1937; 1960) explains that if only price mechanisms sustained the economic system, there would not be a reason for the existence of firms, within which market transactions do not appear, and an entrepreneur-coordinator substitutes price mechanism. The author brings the idea of transaction costs that depend on institutions to have their value perceived by an organizational actor (Coase, 1960). Transaction cost is the construct that gives a theoretical foundation to economic institutionalism. This shift led to the new institutional economics perspective. Williamson (1973) and North (1990) later on contributed to this same perspective.

From a sociological and organizational perspective, Selznick (1948) brings institutionalization as a process occurring within the organization in a matter of time and space. Experiences and aspirations of people allocated inside the organizational boundaries, as well as interests arising from small groups and society, are responsible for shaping the organization. As relevant Veblen is to the institutional economy, Selznick is to the organizational institutionalism. The author takes the first step to acknowledge that the organization is, in fact, a reflection of its internal and external environment.

By the end of the 1970s, the studies of Meyer and Rowan (1977) and DiMaggio and Powell (1983) brought new perspectives to institutional theory, strengthening its importance to the understanding of organizational functions and mechanisms. The neo-institutionalism gained prominence with a new outlook for organizational institutionalism.

Meyer and Rowan (1977) move forward the understanding of institutionalization by affirming that contextual elements drive organizations to adopt practices and procedures institutionalized in society in order to enhance its legitimacy and guarantee access to resources as well as its sustainability. This process has isomorphic characteristics, and it emphasizes some consequences to the organization: a) formal

structure modifications; b) adoption of external evaluation criteria; and c) reach of stability (Meyer & Rowan, 1977). In the pursuit of legitimacy, the organization alters its formal structures under the terms of action and behavior patterns institutionalized in the environment. Besides, the organization undergoes external evaluation criteria, as audit procedures, so that it may have some service acquisition eased. In the bottom line, isomorphism stables internal and external relations and enhance the access to resources deriving from these same relations.

DiMaggio and Powell (1983, p.143) move in the opposite direction of traditional organizational theory, concerned with organizational differentiation when they develop their study under the question of "why there is such startling homogeneity of organizational forms and practices." In their answer to this question, the authors suggest the concept of organizational field, *per se* "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio and Powell, 1983).

Three key elements characterize organizational fields: a) positions; b) understandings and; c) rules (Mazza & Pedersen, 2004). Fields are relational spaces that offer opportunities for building stakeholder engagement (Maguire, Hardy & Lawrence, 2004). Also, fields comprise systems of meanings capable of sharing expectations, beliefs, and knowledge (Zilber, 2007). Finally, formal laws and regulations to which organizations must conform in order to avoid sanctions and reprisals support the organizational fields (Greenwood & Suddaby, 2006).

Within the fields, relational spaces offer opportunities to build collaboration among actors (Maguire, Hardy & Lawrence, 2004). Despite presenting considerable heterogeneity in its initial phases, organizations in a field move into homogeneity under three types of isomorphic mechanisms: coercive, mimetic, and normative (DiMaggio & Powell, 1983).

Coercive isomorphic mechanisms stem from two sources: a) pressure between organizations; and b) expectations and pressures on the organization/society frontier. In the first case, the pressure is exerted by large corporations on their subsidiaries or subordination relationships, such as franchises (Dumoulin & Gauzente, 2009). In the second case, the expectations generated by specific cultures and customs of society put pressure on the adequacy of the organization, such as the rules of socio-environmental responsibility (Klarsfeld & Delpuech, 2008).

Mimetic isomorphism occurs when organizations seek to imitate activities or procedures performed within the organizational field. This action stems from reasons such as legitimacy, innate inability to create and develop new practices, or even self-defense against competitive pressures (Haveman, 1993; Martínez-Ferrero & García-Sánchez, 2017).

Normative isomorphic mechanisms stem from demands originating from professionalization and might have two sources: a) professional field; and b) educational field. The first case provides rules and regulations from the body responsible for regulating the activity, as well as the work of class associations (Muzio, Brock & Suddaby, 2013). In the second case, the role played by educational institutions that work in the training of professionals for the area stands out (Slater & Dixon-Fowler, 2010).

The difference between distinct organizational fields becomes a concern of the literature, as it elucidates how organizations relate to the isomorphic elements. Broadly defined as the difference between the institutional profile of two countries, institutional distance becomes an essential dimension in comparing different contexts (Kostova et al., 2019). Institutional distance provides a powerful analytical tool as it provides a broad view of national contexts covering not only cultural but also regulatory and cognitive elements (Hotho & Pedersen, 2012).

Although widely used in international business studies, institutional distance, especially from the perspective of organizational institutionalism, shows the quest for normative legitimacy in different organizational fields. In familiar institutional contexts, organizations understand the existing institutional order and can more easily comply with the legitimacy requirements and expectations (Kostova et al., 2019). By contrast, in unfamiliar contexts, organizations have limited knowledge and understanding operation requirements to establish and maintain a compelling and legitimate operation (Kostova & Zaheer, 1999).

Legitimacy is a central construct in organizational institutionalism. The theoretical construction of the notion that organizations submit to socially established standards links legitimacy as an outcome of this movement (Meyer & Rowan, 1977). The emphasis on legitimacy rather than efficiency as an explanation for the success and survival of organizations reveals the scission between neo-institutionalism and the classic studies of organizational institutionalism (Tolbert & Zucker, 1983). The

institutionalization process, as an adaptation to cultural, normative, and cognitive standards, has its aim at the recognition by the organizational field (Jepperson, 1991).

1.1 Legitimacy in organizational institutionalism

Legitimacy emerges as a concept before the advent of organizational institutionalism. The emergence of the concept is confused with the consolidation of organizational theory as a field of study (Deephouse & Suchman, 2008). Some reviewers credit Weber for introducing legitimacy into sociological theory and then into organizational studies (Suchman, 1995; Ruef & Scott, 1998). Weber's notion of public recognition by different authorities supports discussions about legitimacy (Johnson, Dowd & Ridgeway, 2006). An essential conceptualization of the term legitimacy was produced by Parsons (1956) in adherence to Weber's ideas. Legitimacy brings the congruence of an organization with social laws, norms, and values (Parsons, 1956).

Although legitimacy has an essential role in seminal studies of organizational institutionalism (*i.e.,* Selznick, 1948), its discussion remained tangential in the theoretical field along much of the 20th century (Deephouse & Suchman, 2008). The first uses of legitimacy as an institutional dimension began only after the 1970s, when describing the effects of culture, norms, and cognition on the action of organizations (Meyer & Rowan, 1977) or even in recognition of isomorphic pressures in the field (DiMaggio & Powell, 1983). The term legitimacy is mentioned 43 times in the study on the institutionalization of organizations by Meyer & Rowan (1977). These discussions mean that the organization is subject to pressure from the field to obtain recognition by the field.

Organizations incorporate institutionalized standards in the field as protection against having their conduct questioned (Meyer & Rowan, 1977). The organization becomes, in a word, legitimate. On the other hand, legitimacy, as a social fact, protects organizations from immediate sanctions due to variations in their technical performance (Scott & Lyman, 1968). Institutionalists argue that legitimacy enhances organizational survival (Deephouse & Suchman, 2008).

Under the aegis of neo-institutionalism, legitimacy comprises the absence of questioning about the existence of an organization. Legitimacy is defined as "the degree of cultural support for an organization – the extent to which the array of established cultural accounts provide explanations for its existence, functioning, and

jurisdiction, and lack or deny alternatives" (Deephouse & Suchman, 2008, p. 6). An utterly legitimate organization is one in which no question about its existence would be raised (Meyer & Rowan, 1977). Alternatively, even a legitimate organization maintains full, unquestioned freedom to implement its activities (Brown, 1998).

The concept of legitimacy also resides in the perception of society as a way of validating the actions of a specific organization. Legitimacy is a widespread perception that an entity's practices are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995). Thus, legitimacy depends on the context, on the perception of peers for its occurrence.

Social validation is essential to differentiate a legitimate social element from an institutionalized social element. Jepperson (1991) warns that some elements, such as fraud, bribery, organized crime, and political corruption, can be institutionalized without being legitimate. An institutionalized element is one in which patterns of behavior are shared by a particular group, while legitimacy requires the validation of society-at-large (Deephouse & Suchman, 2008). Also, the validation is contextualized; the interpretation of cultural values depends on the social context in which they are inserted. For instance, one group's terrorist is often another group's freedom fighter (Jepperson, 1991).

Legitimacy still resonates as an organization credential for access to resources that might be essential to its survival. Legitimacy status is a fundamental condition for easy access to resources, unrestricted access to markets, and long-term survival (Brown, 1998). It is important to note that legitimacy is not a commodity to be owned or exchanged, but a condition that reflects cultural alignment, normative support or affiliation with relevant rules or laws (Scott, 1995).

Discussions about legitimacy in organizational institutionalism traditionally occupy theoretical literature (Deephouse & Suchman, 2008). The literature also discusses dimensions and sources of legitimacy in organizations.

1.1.1 Legitimacy dimensions

The first proposals for dimensioning legitimacy emphasize that legitimate organizations result from suppositions of 'rational effectiveness' (later termed pragmatic legitimacy), 'legal mandates' (regulatory or sociopolitical legitimacy), and 'collectively valued purposes, means, goals,' (normative or moral legitimacy) (Meyer &

Rowan, 1977). Once a legitimate organization is subject to field pressures, this dimensioning is in line with mimetic, coercive, and normative pressures (DiMaggio & Powell, 1983).

From behavioral, cognitive, and regulatory dimensions, the literature evolves to typify these dimensions. Based on rules in the organizational field, Stryker (1994) distinguished between behavioral consent to rules, attitudinal approval of rules, and cognitive orientation to rules (Deephouse & Suchman, 2008). This typification summarizes the response of behavioral elements of the organization on structural elements of the organizational field.

The query about the validity of the organization may also typify legitimacy. Two questions arise regarding performance and value (Hirsch & Andrews, 1984). Performance challenges occur when relevant actors perceive organizations as having failed to execute the purpose for which they are employed and claim support. Value challenges place the organization's mission and legitimacy for existence at issue, regardless of how well it has fulfilled its agreed-upon goals or function (Deephouse & Suchman, 2008).

Another dimension of legitimation differentiates cognitive elements from the socio-political context. Cognitive legitimation lies on the spread of knowledge about a new venture, while sociopolitical legitimation reckons the process by which the general public, key stakeholders, key opinion leaders, or government officials accept an endeavor as appropriate and right, given existing norms and laws (Aldrich & Fiol, 1994). Scott (1995), later on, subdivided Aldrich and Fiol's 'sociopolitical' category to arrive at three dimensions of legitimacy - regulatory, normative, and cognitive - linked to his three pillars of institutions.

Suchman (1995) proposes a broad typification, with twelve distinct forms of legitimacy. Behavioral and normative elements in legitimacy are fundaments of this typification (Deephouse & Suchman, 2008). Pragmatic legitimacy comprises exchange, influence, interest, and character; moral legitimacy comprises consequences, procedures, persons, and structures; and cognitive legitimacy comprising predictability, plausibility, inevitability, and permanence (Suchman, 1995).

Some proposals also seek to integrate dimensions of legitimacy. Based on contextual bases, the regulatory and sociopolitical dimensions are similar in characteristics, while the combination of normative and cognitive dimensions gives rise to a new category of cultural legitimacy (Archibald, 2004). Thus, it is possible to

distinguish the dimensions of legitimacy in two large groups of typifications. The first group defined here as behavioral/cognitive brings elements that reflect relationships, understanding and symbology that can define legitimacy. The second group defined here as structural resonates norms, rules, and coercion as forms of legitimation. Table 01 portrays a set of typifications for each group.

Table 1 - Dimensions of legitimation under organizational institutionalism

Authors	Behavioral/cognitive	Structural
Meyer & Rowan (1977)	Legitimacy based on *relational effectiveness* and *collectively valued purposes, means, goals*.	Legitimacy based on *legal mandates*.
Hirsch and Andrews (1984)	*Performance challenges* and *value challenges*	-
Stryker (1994)	*Behavioral consent* to rules, *attitudinal approval* of rules, and *cognitive orientation* to rules.	-
Aldrich & Fiol (1994)	*Cognitive legitimation*	*Sociopolitical legitimation*
Scott (1995)	*Cognitive legitimation*	*Regulative* and *normative legitimation*
Suchman (1995)	*Pragmatic legitimacy* as a set of exchange, influence, interest, and character; *Cognitive legitimacy* as predictability, plausibility, inevitability, and performance.	*Moral legitimacy* as consequences, procedures, persons and structures

Source: elaborated by the author.

The literature demonstrates the predominance of discussions around the behavioral/cognitive dimensions of legitimacy, while the consensus on structural dimensions is evident. The literature configuration expresses the concern of organizational institutionalism in demonstrating the organization's effects and responses to field pressures. On the other hand, the effect of adapting to rules and regulations is evident so that an organization might be legitimized.

1.1.2 Legitimacy sources

Legitimation trails a process of social interaction. Legitimacy holds a social construction and emerges out of the organization's relation to value, cognitive, regulative, and normative cognitive frameworks in a broader social system

(Deephouse & Suchman, 2008). Thus, there is a parallel between the process of legitimation and institutionalization (Lawrence, Winn, & Jennings, 2001).

However, the discussion about the sources of legitimacy goes beyond the definition of the process and seeks to understand those elements capable of validating or not the organization's performance. Meyer and Scott (1983) identify two groups of actors capable of endowing the organization with legitimacy. The first group embraces those who have legitimacy strictly linked to the organizations they represent – *i.e.,* the State. The second stems from his professional background as a specialist, having a collective authority over what is acceptable – *i.e.,* lawyers, accountants, intellectuals. A central concern for legitimation research is the identification of that group that holds collective authority over legitimacy in any given setting (Deephouse & Suchman, 2008).

Naturally, society-at-large is a source of legitimacy (Deephouse & Suchman, 2008). The broad social group reproduces the framework of acceptable standards for validation. The larger the group, the higher the strength of recognition and validation. An example is the link between cognitive legitimacy and mimetic isomorphism that argues that the more numerous the adopters of a particular practice, the more widespread its acceptance and the higher its legitimacy (Strang & Soule, 1998; Tolbert & Zucker, 1983).

The fourth source of legitimacy lies in interorganizational relations since an organization becomes legitimate as it connects with other legitimate organizations (Galaskiewicz, 1985). In this sense, relations with charity organizations stand out as a support for an organization's social concern (Higgins & Gulati, 2003). The interlocking directorship (Cohen & Dean, 2005), and strategic alliances with prestigious partners (Galaskiewicz, 1985; Oliver, 1990) constrains the similar purposes. All these relationships, when properly built and publicized, tend to reinforce the organization's legitimacy.

Legitimacy remains present in recent discussions on organizational institutionalism. Although neo-institutionalism may identify the effects of pressure from the organizational field on the organization's activities in search of legitimacy (DiMaggio & Powell, 1983), the institutionalization process instigated new perspectives, with changes in the level of analysis and theoretical construction. Institutional logics and institutional works are prominent insofar as they might elucidate

the processes of institutional change yet under the understanding of constraining patterns over the organizational action.

1.2 Institutional Logics

Neo-institutionalism is concerned with the bases of formation in the organizational field and its pressures on organizational action (Meyer & Rowan, 1977; DiMaggio & Powell, 1983). However, the strict analysis of the organizational field is unable to demonstrate the content and meanings of institutions (Thornton & Ocasio, 2008). For this, Friedland & Alford (1991) proposed a change of perspective that goes beyond the restricted connection of institutions and organizational fields. Institutional logics seek to answer what institutions are made of and how agents interact with their fundamental dimensions (Thornton & Ocasio, 2008).

The seminal text of institutional logics describes the contradictions between practices and beliefs of different institutions in modern society (Alford & Friedland, 1985). Subsequent empirical work has shown that the broad view of society as space where institutions coexist helps to identify the content and meaning of institutions (Thornton & Ocasio, 1999; Haveman & Rao, 1997).

The overlapping of institutional orders – *i.e.,* capitalism, state bureaucracy, and political democracy – elucidates contradictions about patterns of practices and behavior (Thornton & Ocasio, 1999). Rather than positioning homogeneity and isomorphism in the organizational fields (DiMaggio & Powell, 1983), the perspective of institutional logics analyzes any context as potentially influenced by contending logics of different societal sectors (Thornton & Ocasio, 2008).

The focus under the perspective of institutional logics does no longer focus on isomorphism but on the effects of a set of normative, cognitive and structural patterns that vary according to the context – *i.e.,* markets, industries, population communities – on the action of individuals and organizations (Thornton & Ocasio, 2008). Institutional logics shape rational, mindful behavior, that individual and organizational actors have some agency in shaping and changing institutional logics (Thornton, 2004). By presenting a link between institutions and action, the approach to institutional logics goes beyond the macro and structural perspectives of neo-institutionalism (Meyer & Rowan, 1977; DiMaggio & Powell, 1983).

The institutional logics approach still claims its distance from the neo-institutionalist literature by proposing that institutional logics are intertwined in time and space. It is non-deterministic, which means no institutional order with its associated principles of organization and logics of action sustains causal primacy a priori (Thornton & Ocasio, 2008). Although institutional standards carry a historical factor, they do not respect a dynamic of linearity but somewhat cyclical or punctual, where the current action partially responds to traditional behavioral patterns (Thornton, Jones & Kury, 2005).

Institutional logics shapes the way a particular social world works (Jackall, 1988). It constrains a set of rules, premiums, and sanctions the individuals in particular contexts create and recreate in such a way that they have their behavior regularized and predictable (Jackall, 1988). This definition highlights the predictability of behavior in society and, similarly to the definitions of neo-institutionalism, in response to the set of social norms. However, theoretical innovation brings the perspective of the individual not only as constrained but as a supporter of the set of social rules. Furthermore, in this institutional view, logics are embodied in practices, sustained and reproduced by cultural assumptions and political struggles (Thornton & Ocasio, 2008).

The concept evolves to a broader definition, capable of integrating structural, normative, and cognitive aspects. Thornton & Ocasio (1999, p. 804) defined institutional logics as "the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality." Material practices, in this view, are individual actions endowed with intentionality and directed to the creation or reproduction of social structures. Furthermore, assumptions, values , and beliefs are socially shared cognitive patterns. Finally, rules give the character of normality to this definition. As this definition manages to more fully integrate the relationship between organizational action and structural, normative, and cognitive standards, the institutional logic of Thornton & Ocasio (1999) depicts greater adherence to the objectives of this dissertation.

1.2.1 Conceptual development of institutional logics

The development of essential concepts in studies on organizational institutionalism helps to define institutional logics as a unique approach. The institution,

institutional order, institutional dimensions, and actors are concepts summarized in table 02. While seeking to differentiate itself as a new theoretical perspective, the literature on institutional logics calls traditional constructs of organizational institutionalism and reshapes its definitions based on the interpretation that institutions coexist in society-at-large (Zilber, 2013).

Table 2 - Conceptual chart of Institutional Logics

Concept	Characteristic	Authors
Institution	Supraorganizational patterns of activity entrenched in material practices and symbolic systems by which individuals and organizations create and reflect their material lives and render their experiences meaningful	Friedland & Alford (1991); Jackall (1988)
Institutional orders	Widely legitimized institutions that coexist in society-at-large – *i.e.,* markets, corporations, professions, states, families, and religions	Jackall (1988); Thornton, (2004)
Actors	Individuals or organizations that produce or reproduce institutional logics.	Thornton & Ocasio (2008)
Institutional dimensions	Structural (coercive), normative and symbolic (cognitive) as as inseparable dimensions of institutions.	Thornton and Ocasio (1999); Zilber (2013).

Source: elaborated by the author.

The conceptual development of the institutional logic approach, as well as all organizational institutionalism, depends on the definition of what is an institution. In this approach, therefore, institutions are supraorganizational patterns of activity entrenched in material practices and symbolic systems by which individuals and organizations create and reflect their real lives and render their experiences meaningful (Fierdland & Alford, 1991). The institution as a concept brings fundamental elements of neo-institutionalism (Meyer & Rowan, 1977; DiMaggio & Powell, 1983) such as the existence of conceptions, models, or logics at a supraorganizational level, and either implicitly or explicitly emphasize the role of culture in shaping and interpreting individual and organizational activities (Thornton & Ocasio, 2008).

Institutions hold mechanisms for leveraging organizational action (Fierdland & Alford, 1991). The literature on institutional logics highlights at least three mechanisms. Collective identity – *i.e.,* organization, industry, community – is a mechanism centered on the sense of belonging to a particular group. Contests for status and power based on rules and norms (Jackall, 1988) is also a mechanism by which institutions shape

action. The third mechanism is the social classification and categorization – *i.e.,* the definition of professions and hierarchy (DiMaggio, 1997).

The institutional logics approach defines the institutional orders of society – *i.e.,* markets, corporations, professions, states, families, and religions (Thornton, 2004). Each institutional order has a central logic that constrains both the means and ends of individual behavior and embraces individuals, organizations, and society (Friedland and Alford, 1991). Although they reinforce their behavioral patterns in order to guarantee their subsistence, these institutional orders coexist in society. For instance, the health care field is constrained by the institutional logics of the democratic state, the market, and the professional logic of medical care (Scott et al., 2000).

The logics of each institutional order guides the organizing principles and provides social actors with vocabularies of motive and a sense of identity (Thornton & Ocasio, 2008). Individuals, groups, and organizations reach practices and symbols are available throughout the social context to further elaborate, manipulate, and use to their advantage (Friedland & Alford, 1991).

It is also worth mentioning the definition of actors under the institutional logic approach. Every individual inserted in a social context has its action constrained to institutional logics (Friedland & Alford, 1991). Even so, the literature deals with the organization's behavior as a producer and reproducer of institutional logics (Thornton & Ocasio, 2008). The actor, therefore, can be both individual and organizational.

A conceptual novelty of institutional logic is the dimensioning of the institution. The authors opportunely discuss which dimensions should comprise the analysis of institutional logics; however, there is consensus on the inseparability of these dimensions in the analysis (Thornton & Ocasio, 2008; Zilber, 2013). Three dimensions stand out: structural, normative, and symbolic (Thornton & Ocasio, 1999).

The structural dimension reflects the relationships between actors and practices observed in the context of institutional logics. The analysis under the structural dimension highlights both the inter-institutional contradictions – *i.e.,* comparison between market and family (Friedland & Alford, 1991) – and intra-institutional contradictions – *i.e.,* comparison between organizational forms within the same industry (Jackall, 1988).

The normative dimension brings the set of rules and norms that constrain organizational action. The form and interpretation of this set define how institutional

logics will influence the behavior of individuals and organizations in society (Jackall, 1988; Thornton & Ocasio, 1999).

Finally, symbolic dimensions deal with the cognitive impact of institutional logics. Discourses, vocabulary, materials, and rhetoric compose the symbol system that influences the organization's actions constrained to a specific institutional logic (Friedland & Alford, 1991; Thornton & Ocasio, 1999).

In addition to relevant conceptual definitions, a set of assumptions support the institutional logics approach. Thus, the approach seeks to sustain as institutions, through their underlying logics of action, shape heterogeneity, stability, and change in individuals and organizations (Thornton & Ocasio, 2008).

1.2.2 Assumptions of institutional logics

The theoretical assumptions of the institutional logics approach are five: a) embedded agency; b) society as an interinstitutional system; c) institutions at multiple levels; d) material and cultural foundations of institutions; and e) historical contingency. Even though the embedded agency plays a central role in supporting the theoretical approach, the other assumptions indicate paths to an innovative perspective of organizational institutionalism.

The core assumption of the institutional logic approach brings the embedded agency into the discussion. Interests, identities, values, and assumptions of individuals and organizations are embedded within prevailing institutional logics (Thornton & Ocasio, 2008). From this perspective, it is not possible to dissociate the actions of individuals from institutional logics, whereas institutional logics are constructed and reproduced from the actions of individuals. Decisions and outcomes derive from the interplay between individual agency and institutional structure (Jackall, 1988; Friedland and Alford, 1991).

The paradox of the embedded agency assumes that individuals or organizations have partial autonomy in any decision taken in the social context (Battilana & D'aunno, 2009). Society consists of three levels – individuals competing and negotiating; organizations in conflict and coordination; and institutions in contradiction and interdependency (Thornton & Ocasio, 2008). All three levels are necessary to understand society adequately. The dynamics of decision making of the individual or organization – as a dynamic of agency – takes these three levels to embed, that is,

actions taken by the individual are leveraged by the organization, which in turn is leveraged by the institution to which it belongs (Battilana & D'aunno, 2009). The research on institutional logics is inherently cross-level, highlighting the interplay between individuals, organizations, and institutions (Thornton & Ocasio, 2008).

This assumption enriches the theoretical approach as it enables and, at a certain point, instigates cross-level analysis. Rather than favoring one level over another, this perspective suggests that while individual and organizational action is entrenched within institutions, institutions are socially constructed and therefore constituted by the actions of individuals and organizations (Thornton & Ocasio, 2008).

The second assumption of the theoretical approach implies the understanding of society as an interinstitutional system (Friedland & Alford, 1991). There is not only one source of rationality, as in the organizational field (Meyer & Rowan, 1977), but multiple sources.

Individuals and organizations deal in society with institutional logics from different institutions, whether in complementarity or competitiveness. The examples of institutional orders foreseen in the literature – *i.e.,* markets, corporations, professions, states, families, and religions (Thornton, 2004) – support this statement. As an organization establishes itself in a given social context, it must respond and, at times, choose to which institutions its action will be aligned.

Besides coexisting in society, institutions are observable at different levels. The multiplicity of levels of occurrence of the institutions is the third assumption of the theoretical approach. Although the seminal text explores the coexistence of institutions at the level of society (Friedland & Alford, 1991), institutions deploy in restricted social contexts, such as markets, industries, interorganizational networks, geographic communities, and organizational fields (Thornton & Ocasio, 2008).

Once the theoretical approach accepts analysis at several levels, it is up to the researcher to define which levels will be settled for analysis. If the option is for analysis at multiple levels, the literature highlights the need for theoretical mechanisms that might operate at different levels of analysis (Thornton & Ocasio, 2008). Social interactions, for instance, may become a mechanism as such, insofar as they are observable at the level of interorganizational networks, industry, and the broad organizational field.

The fourth assumption from the approach of institutional logics brings the material and cultural foundations of the institution. Each institutional order in society

supports material and cultural characteristics (Friedland & Alford, 1991). As material characteristics, stand structures, infrastructure, tools, legislation (Ocasio, 1999), while cultural foundations account for symbology, cognitive schemes, behavior, relationships (Thornton, 2004). The analysis assumes that instead of privileging one or the other constituent characteristic of the institution, research under the approach of institutional logics must recognize that institutions develop and change as a result of the interplay between material and culture (Thornton & Ocasio, 2008).

Finally, historical contingency is the fifth assumption of the theoretical approach to institutional logics. Behavior patterns are shared over time, providing institutional logics with a historical characteristic (Scott et al., 2000).

In any case, institutional logics embed in time and space (Thornton & Ocasio, 1999). Institutional logic found in a given period will not necessarily be found in another, even if the social group remains the same (Thornton & Ocasio, 2008). Contextual characteristics influence the processes of (de)institutionalization (Friedland & Alford, 1991).

Figure 01 portrays the role of assumptions regarding the analytical capacity of the approach of institutional logics. Based on the set of five assumptions, empirical research might demonstrate how institutions, through their underlying logics of action, shape patterns of action, and conduct in individuals and organizations.

Figure 1 - Theoretical assumptions of institutional logics
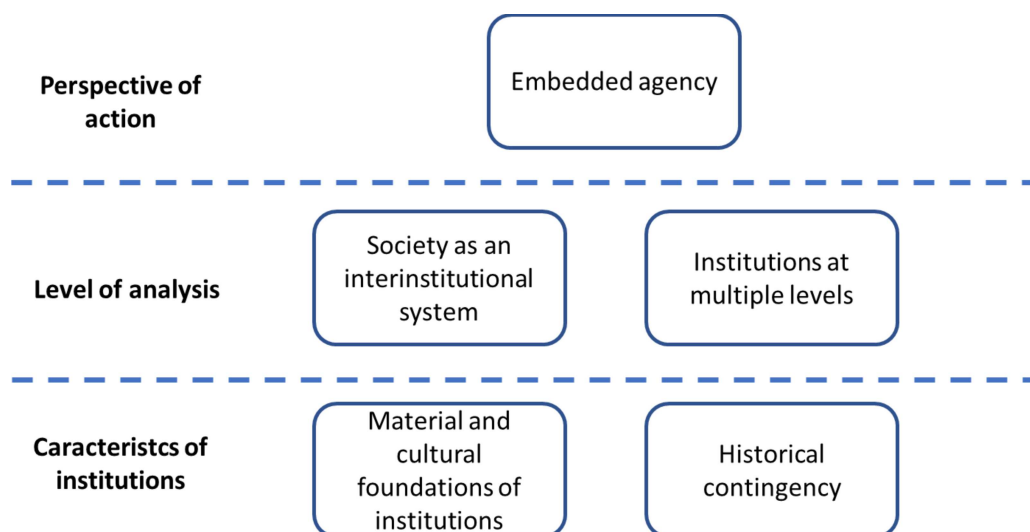
Source: elaborated by the author based on Thornton and Ocasio, 2008, Friedland & Alford, 1991, and Jackall (1988).

As a core assumption, the embedded agency traces the perspective of action in the analysis of institutional logics. The embedded agency implies the interplay between determinism and voluntarism in the analysis of the individual's ability to act (Battilana & D'aunno, 2009). Human action is not entirely displaced from institutionalized patterns, whereas these institutionalized patterns themselves depend on the human agency for their reproducibility and continuity. The researcher must consider that institutional logics at the same time influence and suffer influences from human agency.

The assumptions that consider society as an interinstitutional system and the institution as multiple levels of analysis support the definition of the level of analysis of the research. Institutions coexist and are identifiable from different social spaces, whether broad or restrict (Thornton & Ocasio, 2008). These assumptions imply that research that applies the approach of institutional logics must define not only the institution but the levels of analysis at which the institutional logics may appear.

The theoretical assumptions also highlight characteristics of the institutions with the material and cultural foundations and with the historical contingency. The researcher must reckon the inseparability of material and cultural characteristics, as well as the historical context, for the definition of the institution as an objective of analysis.

The applicability of institutional logic as a lens of analysis is substantial. Court lawsuits (McPherson & Sauder, 2013), renewable energy industry (York, Hargrave & Pacheco, 2016), wine industry (Voronov, Clercq & Hinings, 2013), health care (Martin et al., 2015), public policies (Fan & Zietsma, 2017) are some examples of the proficiency of fields of study in which institutional logics are applicable.

The approach of institutional logics brings an advance to organizational institutionalism to the extent that it presupposes the content and meanings of institutions. Although the approach recognizes organizational action as reproducing institutional logics, the perspective still has deterministic characteristics. A recent approach, focusing on human action, effectively seeks to bring the voluntarist perspective to the center of discussions of organizational institutionalism. Institutional work claims that every institutional movement, whether for creation, maintenance, or disrupture, is explained by practices undertaken by individual or collective actors (Lawrence & Suddaby, 2006).

1.3 Institutional Work

By the end of the 1980s, theorists propose a new shift to institutional theory: from a perspective concerned with convergence, compliance, stability, passivity, and homogeneity of actors to the exploration of divergence, disagreement, instability, proactivity, and heterogeneity of individual actors (Levy & Scully, 2007). An intriguing question lead to new outlooks: "if institutions control conduct, how are institutions established, and how do they change?" (Willmott, 2011, p.68).

Hence, the lens of analysis lowers to the individual as capable of creating or causing changes to institutions. This new vision firstly appears in early studies of institutional entrepreneurship (Eisenstadt, 1964; DiMaggio, 1988). Although Eisenstadt (1964) brings its first conceptualization, institutional entrepreneurship echoed in the study of DiMaggio (1988), where the author claims that researches in institutional theory should also regard the processes of creating and disrupting institutions. Centered to these processes is a powered and legitimized individual (Maguire, Hardy & Lawrence, 2004).

Taking advantage of this new branch of analysis in institutional theory, Lawrence and Suddaby (2006) propose the institutional work perspective. Similarly to institutional entrepreneurship, this fresh perspective emphasizes the influence of individual actors over institutions. Nevertheless, the individual to institutional work is not the same voluntarist and heroic as for the institutional entrepreneurship (Willmott, 2011). Institutional work focuses on the daily practices and ordinary strategies through which individuals intentionally shape institutional patterns under which they operate (Dover & Lawrence, 2010), in a continuous and evolving process that adjusts to time and space (Styhre, 2014). Another acknowledged variation lies in the focus of action: while institutional work is concerned with practices to balance a variety of environmental needs, institutional entrepreneurship sheds light on actors maximizing resources to create new institutions (Styhre, 2014).

The institutional work, therefore, brings novelty to institutional theory while considers the individuals and does not leave uncovered the processes of institutionalization or deinstitutionalization. Institutional work is "the purposive action of individuals and organizations aimed at creating, maintain, and disrupting institutions (Lawrence & Suddaby, 2006, p. 215). Institutional work is a valuable perspective because it brings the actor as the central point of institutional theory by establishing it

as the main responsible for institutional change as well as being attributed by maintaining institutional stability (Hwang & Colyvas, 2011).

Institutions must embrace social needs and beliefs to maintain their structural and cognitive legitimacy inside the organizational field. There is a risk in institutional theory to disregard the rationality of individuals' choices, giving rise to nonreflective activity (Styhre, 2014). The institutional work evolves precisely on this point, seeking propositions for the emergence, maintenance, and disrupture of institutions by the purposeful agency of individuals. This shift is relevant, since it approximates the institutional theory of critical theory, by positioning the individual as responsible for the dynamics of institutions (Lawrence, Suddady & Leca, 2011).

The institutional work is exceptionally robust to strategy analysis. The notion of institutional work also makes it possible to consider the use of dimensions – *i.e.,* mythic and symbolic - that are often neglected by strategy research because they do not hold a direct link to economic activity (Slimane & Leca, 2010). Thus, the forms of institutional work, such as the creation of myths around the origin and history of institutions, the questioning of beliefs or the dissociation between practices and sanctions (Lawrence & Suddaby, 2006), illustrate the connections between institutional processes rooted in culture and cognition on the one hand, and the strategy of actors on the other.

By focusing on the behavior of individuals, institutional work intensifies the discussion around the interplay between agency and institutions (Lawrence & Suddaby, 2006; Lawrence, Suddaby & Leca, 2009). The dualism between agency (individual, organizational action) and institutions (social structures) permeates the discussions on the theme (Battilana & D'Aunno, 2009; Dover & Lawrence, 2010). Although the advent of neo-institutionalism itself brings this discussion to the institutional theory (DiMaggio & Powell, 1983), it is the institutional work discussions that make it fortified. This duality between agent and agency points to the main conceptual elements in institutional work as a theoretical perspective: institutions, actors, and practices (Willmott, 2011).

1.3.1 The notion of the institution under the institutional work perspective

One of the essential elements of institutional work is the definition and characterization of institutions as the ultimate objective of all action (Lawrence & Suddaby, 2006). Institutional work derives from the organizational approach of

institutional theory. According to this line of research, institutionalization is a process of adaptation of action to patters acknowledged as acceptable by the industry to which an organization is embedded (Selznick, 1948). The organization pursues this adaptation pushed by an impetus of legitimization to guarantee access to resources and survival in the field (Meyer & Rowan, 1977).

Under the neo-institutionalism, institutions are systems of rules or social-based programs reproduced through routines (Jepperson, 1991). In this definition, the literature recognizes the structuralist character of institutions in a similar way to economic institutionalism that values rules and standards of conduct (Coase, 1937; Williamson, 1973). However, the literature goes further and brings cultural and cognitive aspects to the definition of institutions. Scott (2008), for instance, balances the weight between regulatory, normative, cultural-cognitive features that, combined with activities and resources, provide stability and meaning to social life. Thus, institutions also include shared symbolic systems, such as language, religion, law, and science (DiMaggio & Powell, 1983).

The power of sanctions also depicts a tool for cohesion in the characterization of institutions (Thornton & Ocasio, 2008). Institutions are part of the constitution of society since they provide values, preferences, rights, norms, guidance, warnings, standards, perspectives, language, and meaning (Willmott, 2011). The social context will define the rules and consequences that will lead to the legitimation of organizational actions (Kiser & Ostrom, 2000).

Evolving on these concepts, institutions under the definition sustained by the institutional work approach are "those (more or less) enduring elements of social life that affect behavior and beliefs of individuals and collective actors by providing templates for action, cognition and emotion" (Lawrence, Suddaby & Leca, 2011, p. 53). Institutions form a social context to which organizations are embedded being pressured by it and, recursively, being agents of its constitution. A social context represents not only patterns of established meaning, but also sites within which renegotiations of meaning take place (Aldrich & Fiol, 1994).

Cooperation in innovation environments requires cognitive, cultural, and structural alignment so that it can transform actions into effective results of technological development (Song, 2016; Hwang and Horowitt, 2012). For this reason, the definition of Lawrence, Sudabby & Leca (2011), capable of embracing structuralist,

normative, and cognitive elements of the institution into the outcomes of institutional alignments, is the best fit for analysis of this study.

The institutions analyzed in the literature on institutional work are diverse. The organizational field of struggle between the timber industry and ecologists (Zietsma & Lawrence, 2010); social relations within the confines of a religion (Styhre, 2014); (Bucher, Chreim, Langley & Reay, 2016), pharmaceutical industry (Singh & Jayanti, 2013) elucidate the analysis of institutions in institutional work. Together, these institutions comprise elements of social life capable of shaping social contexts. The system of practices and beliefs that allow the development of innovation is no different.

Institutions, as a product of institutional work, are the result of the deliberate action of individuals or organizations (Lawrence & Suddaby, 2006). These actors are the second pillar of the institutional work perspective.

1.3.2 The notion of the actor under the institutional work perspective

The institutional work implies the intentional and reflexive effort of individual or collective actors to create, maintain, or disrupt institutions (Lawrence & Suddaby, 2006). This definition elucidates the role of the individual in the dynamics of institutions. Here, the individual is not a mere spectator oppressed by institutional forces, but an actor of change (Styhre, 2014). To do so, the individual must have legitimacy recognized by the field to effectively act (Lawrence, Suddaby & Leca, 2009).

Institutional work treats the agent as an individual, or group of individuals, with the ability to act legitimately in an organizational field (Lawrence, Suddaby & Leca, 2009). The power of agency is an essential feature of the actor responsible for engendering institutional change (Fuenfschilling & Truffer, 2016; Paroutis & Heracleous, 2013). It is worth highlighting the ability of the agent to connect a diversity of individuals who might sustain and diffuse their propositions of institutional change (Zundel, Holt & Cornelissen, 2013). The power of acting as a central element to the agent in institutional work stands for the individual's ability to interfere in the occurrence of any events, either by their direct individual action or by interference in the action of other agents (Lawrence & Suddaby, 2006).

Lawrence, Suddaby, and Leca (2009) point out that such agents in institutional work, although legitimized in the organizational field, are ordinary individuals who develop mundane activities and not necessarily individuals with coercive or normative

power. The work of outsourced professionals in the implementation of safety practices in construction companies (Daudigeos, 2013) or the community's role in deciding strategies for drinking water supply in drought regions (Fuenfschilling & Truffer, 2016) are examples in this regard. However, institutional work studies tend to focus on agents with higher agency power in the field (*i.e.*, Gond & Boxenbaum, 2013; Koskela-Huotari et al., 2015) and there is a concern that this will overshadow the narrative potential of the theme (Dover & Lawrence, 2010; Lawrence, Leca & Zilber, 2013).

Seminal studies of the institutional work perspective bring the intentionality of the agent (Lawrence & Suddaby, 2006; Lawrence, Suddaby & Leca, 2009). The individual acts deliberately in the movements of creation, maintenance, and disruption of institutions (Dover & Lawrence, 2010) and is conscious of its action. However, in recent studies, intentionality is put to the test. Dolbec and Fischer (2015), for example, identify that consumer actions engaged in experimenting with new products create new forms of relationship with the brand and, unintentionally, end up changing the dynamics of the market as a whole. Alvarez, Young, and Woolley (2015) converge in this direction by addressing how entrepreneurs oriented toward maximizing return on their business end up indirectly modifying industry structures. Therefore, there is no consensus on the agent's intentionality in institutional work.

Another characteristic of the agent in institutional work is action sharing. By definition, an individual or group of individuals conduces institutional work (Lawrence, Suddaby & Leca, 2009). Although a large part of the studies focuses on the individual (*i.e.,* Binz et al., 2016; Brès & Gond, 2014), the focus on the organization or the group as a driver of institutional work is observable. The analysis of the role of non-governmental organizations in the transformations of environmental policy in the USA (Bertels, Hoffmann & DeJordy, 2014) and the position of pharmaceutical corporations as the leading agent of institutional work in maintaining the relationship dynamics between their employees and medical clients (Singh & Jayanti, 2013) are examples of collective actors as drivers of institutional work. In time, Empson, Cleaver, and Allen (2013) suggest that isolated individuals are unlikely to be able to drive institutional change. Individuals use a distributed agency; that is, the action is taken together, seeking the synergy of individuals in different positions in the social context (Empson, Cleaver & Allen, 2013).

Whether acting individually or collectively, the actor in the institutional work develops daily repeated actions that lead to the transformation or maintenance of

institutions (Lawrence & Suddaby, 2006). These actions are, therefore, characterized as practices.

1.3.3 The notion of practices under the institutional work perspective

An essential element in the concept of institutional work is the definition of work itself. *Work* demands a physical or mental effort applied with a determined objective. In institutional work, the objective is whether to create, maintain, or disrupt institutions (Lawrence, Suddaby & Leca, 2011). Therefore, institutions do not control human agency, but in fact, it is the institutional work that establishes and maintains daily routines or modifies them according to its objective (Willmott, 2011).

The great novelty of the perspective of institutional work is to shed light on work, as a set of practices that respond to every movement of (de)institutionalization (Willmott, 2011). Practice, as a human agency, is traditionally understood as an outcome and not as an antecedent in studies of organizational institutionalism (Lawrence, Suddaby & Leca, 2011). The institutional work claims to shift this logic (Lawrence & Suddaby, 2006).

In discussions concerning practices in institutional work, three categories are evident: maintenance, disrupture, or institution creation (Lawrence, Suddaby & Leca, 2009, 2011). Among these, the literature primarily focuses on the creation of new institutions (*i.e.,* Binz et al., 2016, Dolbec & Fischer, 2015, Gond & Boxenbaum, 2013), although studies about the disrupture of institutions seem to elucidate more effectively the interaction between agent and agency. Zietsma and Lawrence (2010) reduce institutional change to cycles of reflexivity and contestation of institutionalized practices. Deroy and Clegg (2015), in turn, analyze the rupture of institutional practices led by the Communist Party in the Soviet Union and identify a process of differentiation where the individual begins to acquire greater reflexivity about their actions.

Although institutions bring the idea of automatic mechanisms of social control that induce a relative self-reproduction (Jepperson, 1991), institutional work demonstrates that these mechanisms are, in fact, a routine of mundane practices endeavored by individuals to maintain institutional structures (Lawrence & Suddaby, 2006). Then, the individuals are, in the same way, responsible for maintaining institutions. Two sets of practices are acknowledgeable in this process: ensuring

adherence to the rules system; reproduction of existing norms and belief systems (Lawrence & Suddaby, 2006; Bucher et al., 2016).

The possibility of breaking institutions is not necessarily a novelty in institutional theory. Both in Selznick's early works (1948) and recent works on institutional change, there is the recognition of processes to disrupt institutions (Greenwood & Hinings, 1996; Suddaby & Greenwood, 2005). The contribution of institutional work lies in determining practices for this process. The literature highlights three sets of practices towards the goal of disrupting: disconnect sanctions; dissociate moral foundations; undermining assumptions and beliefs (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010).

Institution-creation seems to be the most studied trajectory in the literature on institutionalization (Lawrence & Suddaby, 2006). A significant effort has been employed to explain the formation of institutions by researchers in similar areas, such as in institutional entrepreneurship (Dacin, Munir & Tracey, 2010), but expressively with a focus on the actors. Once again, the novelty brought by institutional work is the focus on practices. In this way, practices of political work, reconfiguration of belief systems, and alternation of abstract categorizations comprise the set of practices to create institutions (Lawrence & Suddaby, 2006; Alvarez, Young & Woolley, 2015 Binz et al., 2016; Daudigeos, 2013; Empson, Cleaver & Allen, 2013).

Institutions must be grounded in social needs and beliefs to maintain their legitimacy. There is a risk in the institutional theory of distancing rationality from individuals' choices into nonreflective activity (Styhre, 2014). Institutional work evolves precisely from this perspective, trying to explain the emergence, maintenance, and change of institutions by the deliberate agency of individuals. This modification is relevant because it brings institutional theory closer to critical theory by positioning the individual not as a spectator oppressed by institutional forces, but as an actor of change (Lawrence, Suddady & Leca, 2011).

1.3.3.1 Agency in institutional work

By focusing on the conduct of individuals, institutional work intensifies the discussion of the relationship between agency and institutions under institutional theory (Lawrence, Suddaby & Leca, 2009; 2011). The dualism between human agency (individual action) and institutions (social structures) pervades the discussions on the

subject (Battilana & D'Aunno, 2009; Dover & Lawrence, 2010). Although the advent of neo-institutionalism initially brings this discussion into institutional theory (DiMaggio & Powell, 1983), it is the institutional work that has it fortified.

The literature highlights persistent issues that the institutional work perspective might eventually overcome. The lack of reflexivity of the agent depicts as a barrier to the evolution of the field of study (Cloutier et al., 2013). There is an inclination in the literature to portray actors engaged in institutional as experts with the ability to manipulate their institutional environment, but there is a risk in this approach by misjudging the cognitive and emotional efforts essential for the actor to develop reflexivity concerning its actions (Lawrence, Leca & Zilber, 2013). Although reflexivity holds challenging analysis, especially empirically (Zilber, 2013), research on institutional work should deal with this as a central theme of the studies. It is worth to highlight the development of actors' reflexivity, either through the implementation of tools (Raviola & Norbäck, 2013) or environmental issues (Lawrence, Suddaby & Leca, 2009).

Another issue concerns the paradox of the embedded agency (Battilana & D'Aunno, 2009). If the individual sets in a context of institutional pressures that ends up shaping its standards of conduct and cognition (DiMaggio & Powell, 1983), how would it have the strangeness necessary to contest such context (Battilana and D'Aunno, 2009)? This problematic talk strictly with Giddens's (1989) agency-structure dualism, although changing these structures is not the focus of structuring theory.

In order to overcome these issues, some authors use alternative theoretical perspectives or new constructs. Recursive contingency (Deroy & Clegg, 2015), for instance, is a construct based on Luhmann's (1977) theoretical precepts about codification and differentiation. Flexibility is key to this new construct applied to demonstrate that two extremes of institutional theory – institutional work (human agency) and institutional logic (social structure) – are not antagonistic or established in a duality of behaviors, but have porous and sometimes overlapping boundaries through the reflexivity of the individual (Deroy & Clegg, 2015).

Daily actions, as defended in institutional work, are unable to overcome the paradox of embedded agency (Malsch & Gendron, 2013). The resolution of the paradox requires periods and places to experiment with new institutional practices. Thus, Malsch and Gendron (2013) suggest the construct of institutional

experimentation, where the individual would have the freedom to innovate, imagine, and reflect on current institutional standards and propose effective alternatives.

The institutional work considers the interplay between agent and agency in its fundamental conceptualization. The agent, characterized by legitimacy and ability to act on the institutional context, has deliberate intent and holds characteristics of a regular individual who performs mundane activities. The agency is endowed with intentionality and diverges into three categories: creation, maintenance, or rupture of institutions (Lawrence & Suddaby, 2006). The interplay between agent and agency points two issues not yet adequately addressed: the agent's lack of reflexivity about his actions and the embedded agency.

The theoretical perspective of institutional work also invites an amplified view of human agency. When positioning the institutionalization process as an outcome of the work of individual and collective actors, Lawrence, Sudabby & Leca (2011) warn about the fact that the actors might work together to achieve their goals of creation, maintenance, or disruption of institutions. The authors set a precedent for discussions about the distributed nature of agency (Empson, Cleaver & Allen, 2013).

1.3.3.2 The distributed nature of agency

Lawrence, Suddaby & Leca (2011, p. 55) invited researchers to explore agency as a distributed phenomenon, to focus on "how individual actors contribute to institutional change, how those contributions combine, how actors respond to one another's efforts, and how the accumulation of those contributions leads to a path of institutional change." In response, Empson, Cleaver & Allen (2013) argue that agency in institutional work is the outcome of a process of connections between practices of individuals who shape the micro-foundations of institutional work.

Even though literature demonstrates how individuals endowed with power and legitimacy in the field might act as institutional entrepreneurs (DiMaggio, 1988), institutionalization fundamentally grounds on a set of mundane practices (Lawrence, Suddaby & Leca, 2009). Powell and Colyvas (2008, p. 277) argue that "not all change is led by entrepreneurs and surely heroic actors and cultural dopes are a poor representation of the gamut of human behavior." Thus, the individual tends to seek backing in the relationship network that supports the organizational field so that its actions might be successful. Institutional movements require institutional work on the

part of a wide range of actors, both with resources and skills to act as entrepreneurs as well as those whose role is to support or facilitate entrepreneurs' endeavors (Lawrence & Suddaby, 2006).

The richness of the theoretical perspective of institutional work resides in mapping the set of practices, whether undertaken by individual or collective actors, which occur simultaneously in competition and complementarity (Lawrence, Suddaby & Leca, 2009). Based on this mapping of interrelationships between practices, the researcher might find the foundations of institutional movements (Hallett, 2010). Just as institutional logics bring the coexistence of institutions to the debate (Thornton & Ocasio, 2008), institutional work positions the coexistence of practices, arising from human agency, to understand institutionalism.

The conditions that allow the distribution of the agency in institutional work result from differences in the social position of individuals (Empson, Cleaver & Allen, 2013). Social position mediates the actor's perception of the organizational field, both concerning entry options and access to resources (Greenwood and Suddaby, 2006; Lounsbury, 2002). Dominant players in a given field may have the power and influence to bring about institutional change; however, they generally lack the motivation to do so – since the setting of the field works on their benefits – while peripheral players may have the incentives to create or champion new practices, but they generally do not have the legitimacy to change institutions (Garud, Hardy & Maguire, 2007).

When considering the centrality of the agency's role in the assumptions of institutional work, especially from the distribution of efforts among actors in the organizational field, the literature proposes different typification of institutional work (i.e., Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010; Empson, Cleaver & Allen, 2013).

1.3.3.3 Typifications of institutional work practices

The seminal text of the institutional work approach brings the first typification of its practices. Lawrence and Suddaby (2006), grounded on a review of the empirical literature on the processes of institutionalization, identify a set of 17 practices undertaken by individual or collective actors categorized into institutional work to create, maintain and disrupt institutions. Then, later empirical studies under the

perspective of institutional work applied these practices (*i.e.,* Alvarez, Young & Woolley, 2015; Binz et al., 2016; Karam & Jamali, 2013).

Even though the typification of Lawrence & Suddaby (2006) manages to translate a representative part of all the institutionalization actions observed empirically, further studies complement the list of institutional work types. Relational perspectives, for instance, shed light on the actor's transition practices across the social levels of an organizational field (Waldron et al. 2015), or building coalitions (Empson, Cleaver & Allen, 2013). Questions about the actor's intentionality and reflexivity also elucidate complementary typifications, such as indirect institutional work that contributes to moderating the set of coexisting practices in the field (Bertels, Hoffmann & Dejordy, 2014).

While the institutional work acts in the creation, maintenance, or rupture of institutions, it is valid to return to the constitutive dimensions of the institutions proposed by the institutional logic (Thornton & Ocasio, 2008). The structural dimension reflects forms and spaces of relationships between practices of the same institutional logic or competing ones (Jackall, 1988). Then, the normative dimension brings the set of rules and norms that constrain the organizational action (Thornton & Ocasio, 1999). The third dimension is symbolic, where speeches, vocabulary, materials, and rhetoric establish the symbol system that influences the organization's actions constrained to a specific institutional logic (Friedland & Alford, 1991). Thus, the impact over the dimensions of institutional logics might point the way to a possible typification of institutional work.

The literature emphasizes practices aiming at modifying social structures (Waldron et al., 2015, Lawrence and Dover, 2015); building trust systems (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010); and promoting cognitive cohesion in the organizational field (Heaphy, 2013, Landau, Drori & Terjesen, 2014):

a) *social structuring* practices impact the way actors position in the organizational field (Mazza & Pedersen, 2004). Thus, the objective of practices inside this group is to define the social structure capable of stimulating the exchanges between actors (Lawrence & Suddaby, 2006), and to allow actors in different positions within the field to interact (Empson, Cleaver & Allen, 2013);

b) the second group of practices aims at the *configuration of trust systems*, as a set of norms and regulations that might guarantee reciprocity and compensation in the organizational field (Mazza & Pedersen, 2004). The

existence of regulation allows the collaboration to flow within the organizational field while ensuring ownership rights for the actors (Lawrence & Suddaby, 2006);

c) practices of *cognitive cohesion* act on the construction of mutual understanding about the routines inserted in the organizational field (Mazza & Pedersen, 2004). Cognitive cohesion allows actors to recognize each other in the field (Topal, 2015) and recurrently interact.

Table 03 summarizes the typification of institutional work practices. The group of practices reflects the impact on structural, normative, and symbolic dimensions of institutional logics. Besides, the table portrays the authors who proposed such practices.

Table 3 - Institutional work practices based on the distributed nature of agency

Group	Practice	Definition	Authors
Social structuring	Advocacy	Mobilization of political and regulatory support through techniques of social persuasion.	Lawrence & Suddaby (2006)
	Connection among actors with distinct positions	The accomplishment of shared and complementary actions among actors with hierarchically different social positions.	Empson, Cleaver & Allen, 2013
	Social mobility	Search for a social position of higher centrality as a form of institutional work.	Waldron et al. 2015
Configuration of trust systems	Definition	Foundation of rule systems that confer identity status, the definition of participation limits, and hierarchies within the field.	Lawrence & Suddaby (2006)
	Guarantees	Creation of rules structures that guarantee property rights.	Lawrence & Suddaby (2006)
	Configuration of limits	Construction of limits in the organizational field to define the space and rules of action and conduct.	Zietsma & Lawrence (2010)
Cognitive cohesion	Configuration of belief systems	Remodeling of connections among groups of practices as well as moral and cultural foundations of these same practices.	Lawrence & Suddaby (2006)
	Definition of sense-making schemes	Construction of cognitive and cultural convergence among actors.	Topal (2015)
	Theorization	Development and specification of abstract theories and elaboration of cause-effect chains.	Lawrence & Suddaby (2006)
	Education	Education of actors in the skills and knowledge required to support the new institution.	Lawrence & Suddaby (2006)

Source: elaborated by the author

The typification of the institutional work of social structuring splits into three practices observed in the literature: *advocacy*, the *connection among actors with distinct positions* within the organizational filed, and *social mobility*. *Advocacy* practices correspond to the mobilization of political and regulatory support through social persuasion techniques (Lawrence & Suddaby, 2006). Similarly, practices of *connection among actors with different positions* in the organizational field also emphasize the capacity of these actors to interact; however, here, the agency is shared and not unilateral as in advocacy practices (Empson, Cleaver & Allen, 2013). Nevertheless, practices of *social mobility* bring the search for a social position of higher centrality as a form of institutional work that ultimately reconfigures the social position of the actors as a whole (Waldron, Fisher & Navis, 2015).

The typification of the institutional work of configuration of trust systems splits into three practices: *definition*, *guarantees*, and *configuration of limits*. Practices of *definition* construct the rules system that confers identity status and participation in the field (Lawrence & Suddaby, 2006). *Guarantee* practices portray legal frameworks to ensure ownership rights for actors so that they might exchange information and build solutions together (Lawrence & Suddaby, 2006). Practices of *configuration of limits* define rules and forms of conduct for the actors, so practices of defining these limits end up configuring the normative system (Zietsma & Lawrence, 2010).

Cognitive cohesion, as a typification of institutional work, presents a set of four practices: configuration of belief systems, the definition of sense-making schemes, theorization, and education. The practice of *configuration of belief systems* regards remodeling the connections among groups of routines, as well as their moral and cultural foundations (Lawrence & Suddaby, 2006). It is also remarkable, the work of reinforcement and search for the convergence of actors around *schemes of sense-making* (Topal, 2015). These schemes represent rites, materials, and places that reinforce the sense of identity in the organizational field (Hardy & Maguire, 2010). Finally, practices of *theorization* and *education* lead to the diffusion of institutional routines in an organizational field (Lawrence & Suddaby, 2006).

Institutional work, therefore, acts on structural, normative, and symbolic dimensions of institutional logics (Thornton & Ocasio, 2008), facilitating collaboration among actors. The recognition of these practices positions institutional work as a theoretical lens capable of supporting the analysis of relational phenomena.

From an empirical point of view, the theoretical lens of institutional work enables the analysis of social changes (*i.e.,* Styhre, 2014, Karam & Jamali, 2013), political changes (*i.e.,* Deroy & Clegg, 2015), or even internal adaptation to the organization (*i.e.,* Gawer & Phillips, 2013, Heaphy, 2013). However, due to the transformative and disruptive nature of innovations and the implementation of new technologies, institutional work has been particularly crucial in the analysis of these themes, especially in what concerns the acceptance and diffusion of technology (*i.e.,* Binz et al., 2016; Raviola & Norbäck, 2013). Innovation ecosystems, such as organizational fields that determine the path to the technological development of a particular locality, shape a representative concept that deserves more thorough sight under the lens of analysis of institutional work.

2 INNOVATION ECOSYSTEMS

Innovation blooms in a complex, self-regulated, and self-organized environment (Carayanis & Campbell, 2009). The dynamics of this environment, as well as the relationship of organizations with other neighboring organizations, have been recently subject to innovation literature (Chesbrough, 2006; Hui, Fonstad & Beath, 2008). Ecological perspectives provide explanatory propositions capable of elucidating the dynamics of the transformation of these environments (Autio & Thomas, 2014; Rohrbeck, Hölzle & Gemünden, 2009; Adner, 2006). Thus, innovation ecosystems open space both in theoretical literature (Adner & Kapoor, 2010) and empirical literature (Hwang & Horowitt, 2012).

An innovation ecosystem is a complex set of connections among resources, habitats, and residents of a specific area, aiming at easing the development of technology and innovation (Autio & Thomas, 2014). In this environment, actors access material resources (*i.e.,* financing funds, equipment, and facilities) and human capital (*i.e.,* students, teachers, researchers, and representative entities) in combinations that favor the creation and development of new ideas (Song, 2016; Adner e Kapoor, 2010).

Innovation ecosystems comprises elements traditionally studied in the innovation literature, such as government, universities, entrepreneurs (Etzkowitz & Leydesdorff, 1995), infrastructure and politics (Dahlman, Ross-Larson & Westphal, 1987), but also invisible and unstructured elements, such as diversity, trust, rules of interaction and motivation (Hwang & Horowitt, 2012). Autio and Thomas (2014) point out the existence of a platform as a central element in the dynamics of innovation ecosystems operation. While surrounding these platforms (*i.e.,* focal companies, software, collaborative projects), organizations, and end-users may connect to share specific assets (Teece, 2007; Autio & Thomas, 2014).

The set of elements of an innovation ecosystem defines routines of acceptable actions within the collective space of innovation, such as an organizational field - relational spaces with sharing of beliefs, knowledge, laws, and regulations (DiMaggio & Powell, 1983; Mazza & Pedersen, 2004). In contrast to the traditional definition of an organizational field, an innovation ecosystem does not comprise a single industry, but a network of interrelated industries of different products and services that ultimately combine efforts to create value in a specific location (Iansiti & Levien, 2004, Moore, 1993).

Ecosystems initially emerge from the empirical literature in the 1990s (Moore, 1993) and only recently have been discussed in scientific journals of strategy and innovation (Adner e Kapoor, 2010; Pierce, 2009; Teece, 2007). As a result of its empirical aspect, the construct finds not only adepts in the scientific field, but also critics of its use (Oh, Phillips, Park & Lee, 2016), mainly because of its proximity to terminology already used in studies on innovation environments. As a result of the shallow knowledge about the nature of the innovation ecosystem, the literature highlights similarities with constructs of technological parks (Díez-Vial and Fernández-Olmos, 2015), regional innovation systems (Cooke, Uranga & Etxebarria, 1998; Asheim, Smith & Oughton, 2011), quadruple helix (Carayannis & Campbell, 2009) and entrepreneurial ecosystems (Autio & Thomas, 2014). All of these come from the understanding of innovation as potentially influenced by the environment and not enclosed inside the organizations.

Technological parks, or science parks, are places where there is the deliberate action of a university or public or private research center aimed at bringing together companies (mostly SMEs) to implement the outcomes of locally conducted scientific research (Díez-Vial & Fernández-Olmos, 2015; Huang, Yu & Seetoo, 2012). Intending to support companies for their development through technical, logistical, and administrative infrastructure, these organizations help to increase the businesses' competitive capacity and favor the transfer of technology in an innovative environment with constant collaboration between the university and private sector (Bakouro, Mardas & Varsakelis, 2002).

The productivity dynamics of a technology park respond directly to the ability of its satellite companies to connect to scientific research projects (McAdam & McAdam, 2008). This connection guarantees knowledge spillovers, that is, the market application of knowledge developed in universities or research centers (Link & Scott, 2007).

Regional Innovation Systems, such as a geographical delimitation of the National Innovation System (Lundvall, Dosi, & Freeman, 1988), is defined as a space in which "firms and other organizations are systematically engaged in interactive learning through an institutional *milieu* characterized by embeddedness" (Cooke et al., 1998, p.1581). Learning is a central point in this definition since the systemic nature of relationships arises only in local contexts where the structures of productivity (subsystem of knowledge exploration) and knowledge (knowledge generation subsystem) embed in an interactive learning process (Clarysse et al., 2014; Jiao et al., 2016).

The generation and diffusion of innovation, as well as the development of entrepreneurial thinking in regional innovation systems, are due to the local infrastructure, specialized services, and levels of trust involved in the relationship among agents. This dynamic leads to localized economic development (Asheim, Smith & Oughton, 2011). Concerns of researches based on this terminology lie on geographically delimiting the participating actors, as well as the outcomes of innovation developed in this environment.

The Triple Helix model, based on the interaction among University, Industry, and Government, emerged as a frame of reference for the analysis of knowledge-based innovation systems, emphasizing the reciprocal relations among the three actors in the process of creation and application of knowledge (Etzkowitz & Leydesdorff, 1995). Although previous models, such as the National Innovation System (Lundvall, Dosi, & Freeman, 1988) have already warned about the role of these three actors in the development of innovation, Etzkowitz & Leydesdorff (1995) delimit the performance of these actors to demonstrate that their recursive process of collaboration is the essential power that leads to the construction and application of knowledge.

From the triad University, Industry, and Government, a new model of knowledge generation emerges, including social and environmental elements (Carayannis & Campbell, 2009). The Quadruple Helix adds the perspectives of media and culture, as well as civil society, as a determinant for the innovation path (Carayannis & Rakhmatullin, 2014). The cultural aspects included in the model respond to the culture of innovation and search for knowledge, as well as values and lifestyle. In this "fourth helix," society as a user of innovation assumes the role of driving innovation processes, pushing the development of new products and services (Carayannis & Campbell, 2009).

The entrepreneurship ecosystem construct implies the existence of a set of interrelated elements besides the structural conditions that new businesses demand in their initial stages (Ács, Autio & Szerb, 2014). Such conditions stimulate the creation and determine the quality of new businesses, contributing to the emergence of potentially transformative enterprises (Audretsch & Belitski, 2016).

The focus of research under this construct is on defining the conditions for the entrepreneur to pursue and develop innovative solutions (Stam, 2015). Thus, ecosystems comprise a dynamic community of interdependent actors besides institutional, informational, and socioeconomic contexts acting systemically (Audretsch & Belitski, 2016).

The constructs used in the literature to define innovation environments are fundamentally different concerning a) governance and control structures; b) the dynamics of innovation fostering; and c) the borders of the environment. Table 04 summarizes these differences.

Table 4 - Characterizing constructs of innovation environments

	Innovation Ecosystem	Entrepreneurial Ecosystem	Technology Park	Quadruple Helix	Regional Innovation System
a) Governance	Control by a platform or focal organization.	Control centered on the small entrepreneur.	Control centered on the university/ research center.	Control centered on community/ society.	Control shared by structures of productiveness and knowledge.
b) Dynamics	Innovation is an outcome of the actors' ongoing and proactive interaction.	Innovation is an outcome of the entrepreneurial action of SMEs.	Innovation is an outcome of the connection between industry and university/ research center	Innovation as an outcome of addressing the demands of civil society by the triad University, Industry, and Government.	Innovation is an outcome of joint learning between productive and knowledge structures.
c) Borders	Organizations and communities directly linked to a focal platform/ organization.	Public and private organizations directly linked to innovative entrepreneurs.	Organizations linked to a university/ focal research center.	Triad among particular University, Industry, and Government, as well as civil society directly linked to this triad.	Geographic boundaries of a given locality, such as city, state, and region.
Authors	Teece, 2007; Adner & Kapoor, 2010; Autio & Thomas, 2014.	Feld, 2012; Audretsch & Belitski, 2016; Stam, 2015.	Link & Scott, 2007; Díez-Vial, 2015; Huang, Yu & Seetoo, 2012;	Carayannis & Campbell, 2009 Carayannis & Rakhmatullin, 2014.	Cooke et al., 1998 Clarysse et al., 2014.

Source: elaborated by the author

Although the innovation ecosystem construct borrows concepts and elements from different phenomena in innovation literature, the set of governance, dynamics, and borders depict it as a different phenomenon. It is worth recognizing that, because of its definitions, in a given innovation environment, it is possible to identify plural phenomena as elements such as locality, society, universities, government, and the private sector are common in all these constructs. It is a researcher's responsibility to define the fittest phenomenological lens to deepen the analysis of innovation environments.

The innovation ecosystem grounds on deep and repeated interactions among actors pursuing long-term objectives (Song, 2016; Schwart & Bar-El, 2015). Hence, there seems to be a direct link between the dynamics of the evolution of this environment and the evolution of collaboration levels.

2.1 Collaboration in innovation ecosystems

A variety of species of actors who share common objectives inhabit the innovation ecosystems (Brusoni & Prencipe, 2013). These actors interact cooperatively and competitively to develop new products and deliver value that matches market needs (Adner & Kapoor, 2010). Thus, it is not possible to define the success of an innovation ecosystem through the technology development performance of a single company, but rather through the set of actors who find solutions and create value through collaboration (Song, 2016).

Collaboration, as a pattern of organizational behavior, is analogous to the definition of the institution, especially under the perspective of institutional work. Collaboration is the outcome of sharing elements of social life that affect the behavior and beliefs of organizational actors, through templates for action and cognition (Lawrence, Suddaby & Leca, 2011). Also, the individuals who effectively perform collaboration, in addition to cognitively, are similarly emotionally leveraged when making decisions about whether or not to collaborate.

The dynamism and intentionality of relationships characterize innovation ecosystems (Adner, 2006). These relationships are usually complex, interconnected, and built on collaboration, trust, value creation, and expertise in exploiting a shared set of technologies or skills (Autio & Thomas, 2014). Thus, the innovative performance of a particular locality depends on the interactional behavior between focal organizations and complementary partners (Song, 2016).

The existence of collaborative endeavors inside the ecosystem boundaries seems to lever the dynamics of technology development. Valuable ecosystems are productive - transform knowledge into value creation - and robust - resistant to external pressures (Autio & Thomas, 2014). This way, collaboration must be eased and fostered through enabling elements.

2.2 Enabling elements to collaboration in innovation ecosystems

Innovation ecosystems, as organizational fields, are shaped by boundaries and practices (Zietsma & Lawrence, 2010). Inside the organizational field of innovation ecosystems, collaboration stands as an institutionalized behavior of organizational actors prominently aimed at ensuring technological development performance. The institutional logics that sustain the institutionalized collaboration must respond to structural, normative, and symbolic dimensions (Thornton & Ocasio, 2008). It is opportune to emphasize, therefore, that social structures, systems of norms and rules, besides the existence of shared understandings, enable collaborative patterns inside the innovation ecosystem (Hwang & Horowitt, 2012; Schwartz & Bar-El, 2015). Table 05 highlights the enabling elements for interaction.

Table 5 - Enabling elements of collaboration in innovation ecosystems

Group	Element	Definition	Authors
Social structures	Connecting structures	Integrating elements capable of configuring spaces where organizational actors might encounter.	Carayannis & Campbell, 2009; Adner & Kapoor, 2010
	Diversity	Diversity of culture and capabilities is a trigger for social interaction as it stimulates organizations to seek complementarities in neighboring organizations.	Pfeffer & Salancik, 2003 Song, 2016
System of norms and rules	Extra-rational motivations	The search for novelties, adventure, legacy, and even altruism, might also point to motivations for exchange.	Hwang & Horowitt, 2012
	Social trust	Social trust in the innovation ecosystem is the reflection of the mutual-gain relationship mentality spread at society-at-large.	Hwang & Horowitt, 2012
	Ecosystem rules	Seven general rules regulate the ecosystem: acceptance of diversity and non-traditional thinking; open space to hear and to be heard; mutual trust; appreciation of mutual experimentation; search for mutual-gain relationships; error tolerance; willingness to help others without compulsory compensation.	Adner & Kapoor, 2010; Siqueira, Mariano & Moraes, 2014
Shared understandings	Rules implications	The community must share the ability to reckon the system of rules and norms and provide penalty for deviations.	Schwartz & Bar-El, 2015
	Mechanisms to share knowledge	Formal and informal tools, software, patents might both legitimize and guarantee the exchange of knowledge.	Hwang & Horowitt, 2012

Source: elaborated by the author.

The collaboration in an innovation ecosystem depends on integrative elements, such as connectors, whether individuals, organizations, or projects, that behave like a hub for linking different actors or groups (Carayannis & Campbell, 2009; Adner & Kapoor, 2010). The connecting structures allow organizations to be able to speak the same language and create organizational fields to stimulate collaboration. Integrating elements respond to coordination from governance structures capable of ensuring harmonious coexistence and collective decision-making in the ecosystem (Bargues, Hollandts & Valiorgue, 2017).

However, social barriers that hamper the approximation between organizations (Styhre, 2014) often hinder collaboration, and sometimes the connectors are not enough to facilitate interaction (Schwartz & Bar-El, 2015). The simple co-location of actors on a single territory is not enough to produce synergies, and therefore support innovation effectively and in the long term (Berthinier-Poncet, 2014). The diversity plays an important role depicting the social structures that enable collaboration. Cultural and cognitive diversity leads organizations to seek complementarities in neighboring organizations (Pfeffer & Salancik, 2003). While conducting the quest, they communicate and try to find a balance of mutual support. It is the trigger for social interaction (Song, 2016).

Although diversity stimulates the resource complementarity (Pfeffer & Salancik, 2003), the organizations need formal rules and informal norms to guarantee the exchange of resources (Hwang & Horowitt, 2012). Extra-rational motivations, social trust, and ecosystem rules are elements that comprise a system of norms and rules to enable collaboration inside the innovation ecosystem. Individuals, in innovative enterprises, seek beyond traditional economic motivations to optimize gains (Nelson & Winter, 1982; Dosi & Nelson, 1994). Traditional thinking about selfishness and rationality of maximization do not support the innovation ecosystem (Autio & Thomas, 2014). Thus, there are extra-rational motivations, such as the search for novelties, adventure, legacy, and even altruism, which give individuals the motivation to exchange experiences (Hwang & Horowitt, 2012).

Nevertheless, trust works as a catalyst for collaboration. The mutual-gain relationship mentality (Camerer, 1991) generally highlights the levels of trust in the social group. Levels of trust among members of an innovation ecosystem are often a reflection of society-at-large (Hwang & Horowitt, 2012). Thus, there are the rules of the ecosystem, which work as social norms in the community to indicate what is acceptable

and what is not (Jepperson, 1991; Zucker, 1977). There are at least seven general rules raised in the literature on innovation ecosystems (Adner & Kapoor, 2010; Siqueira, Mariano & Moraes, 2014): acceptance of diversity and non-traditional thinking; open space to hear and to be heard; mutual trust; appreciation of mutual experimentation; search for mutual-gain relationships; error tolerance; willingness to help others without compulsory compensation.

Finally, the cultural patterns and understandings must be shared throughout the ecosystem. The community must have the ability to punish deviations from social norms and provide positive mechanisms that lead to shared knowledge (Schwartz & Bar-El, 2015). These norms, by characteristic, are tacit and evolve according to the interaction (Hwang & Horowitt, 2012).

These enabling elements of the collaboration might, therefore, fit into the three essential dimensions of institutional logics. The definition of connectors, in addition to diversity, responds to the structural dimension of institutional logics. The elements of rules definition and trust enablement are directly related to the normative dimension of institutional logics. Finally, motivations and the interpretation of rules integrate the symbolic dimension of institutional logics.

3 DEVELOPMENT OF AN INTEGRATIVE FRAMEWORK

This chapter portrays a comprehensive framework, from a theoretical perspective, concerning how institutional work practices foster collaboration inside the innovation ecosystem. The development of the framework lies on the theoretical perspective of institutional work (Lawrence, Suddaby & Leca, 2011), with an emphasis on practices and the distributed nature of agency (Lawrence & Suddaby, 2006; Empson, Cleaver & Allen, 2013), as well as the theoretical dimension of institutional logics (Thornton & Ocasio, 2008) and the conceptual definitions of innovation ecosystems (Autio & Thomas, 2014, Song, 2016).

This chapters also highlights the establishment of three propositions aiming to synthesize the causal relations between institutional work practices and dimensions of institutional logics. As the literature review demonstrate, the theoretical literature in both traditions – i.e. institutional work and institutional logics – has consistently evolved to portray typifications of institutional work (*e.g.,* Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010; Empson, Cleaver & Allen, 2013) and dimensions of institutional logics (Thornton & Ocasio, 1999; 2008). This theoretical construction support propositions that might connect both ends.

The effectiveness of an innovation ecosystem lies in its ability to generate propositional and recurrent interaction, *per se* collaboration, among its constituent actors (Autio & Thomas, 2014; Song, 2016). The outcome of the institutional work to foster collaboration inside innovation ecosystems is to ensure structure, norms, and symbols that might institutionalize patterns of collaborative behavior.

From the perspective of institutionalizing collaboration, three sets of institutional work practices seem to tackle the need to sustain structural, normative, and symbolic dimensions of institutional logics (Thornton & Ocasio, 2008). The causal relations between these sets of institutional work practices and dimensions of institutional logics gain prominence through three propositions.

Proposition 1 - *The institutional work practices of social structuring lever the structural dimension of institutional logics of collaboration in innovation ecosystems.*

Social structuring practices translate efforts to mobilize political and regulatory support, as well as the connection between actors positioned in different hierarchical

and social structures (Empson, Cleaver & Allen, 2013; Waldron et al. 2015). The purpose of this group of practices is to question and propose communicational and interactional schemes that will support the structural dimensions of the institutionalized collaborative behavior (Lawrence & Suddaby, 2006; Throrton & Ocasio, 2008). Thus, these practices seek a reconfiguration in positions, connections and interplay of actors inside the organizational field.

The institutionalized collaborative behavior, within the organizational field of the innovation ecosystem, highlight platforms as structural dimensions of institutional logics. Platforms capable of connecting individuals, organizations, or projects (Autio & Thomas, 2014; Adner & Kapoor, 2010) depend on the development of formal structures that might guarantee the association of diverse actors. Besides, the borders of the ecosystem, as the delimitation of actors attached to the core platforms, highlights the distributions of actors spread on a context of cultural, normative and cognitive characteristics (Thomas & Autio, 2014; Hwang & Horowitt, 2012). Thus, institutional work practices aimed at reconfiguring positions, connections and interplay of actors might lever the configuration of platforms as a structural dimension of institutional logics that sustain collaborative behavior inside the innovation ecosystem.

The structural dimension is accompanied by normative schemes that would guarantee trust and legitimacy to collaborative behavior (Thornton & Ocasio, 2008; Zietsma & Lawrence, 2010). The second group of institutional work practices sets the configuration of trust systems through practices of defining the foundations that give identity, limits of participation, rules, and norms of action (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010).

Proposition 2 - *The institutional work practices of configuring trust systems lever on the normative dimension of institutional logics of collaboration in innovation ecosystems.*

The institutional work of configuring trust systems encompass the practices of definition, guarantees and configuration of limits (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010). Through these practices the actors propose and set rules systems that confer identity status and the definition of participation limits (Zietsma & Lawrence, 2006). Also, the concerns about property rights take actors to define minimum rules of guarantees (Lawrence & Suddaby, 2006). Thus, this set of practices seeks the

establishment of rules and norms that might regulate interaction within the organizational field.

Minimum rules for interaction end up underpinning trust among entrepreneurs (Hwang & Horowitt, 2012). Even though collaboration emerge from informal interactions where actors might gradually enhance trust (Brusoni & Prencipe, 2013), the formalization of rules and normative guarantee the increase of complexity in interactions that lead to collaboration inside the innovation ecosystems (Hellström et al., 2015; Schroth & Häußermann, 2018). The set of rules and norms characterize the normative dimension of institutional logics (Thornton & Ocasio, 2008). This way, institutional work practices that seek regulation of interaction might lever the configuration of rules and norms as a normative dimension of institutional logics that sustain collaborative behavior inside the innovation ecosystem.

Besides structural and normative, the institutional logics split into the symbolic dimension. Platform structures that shape social configuration, and norms that guarantee trust are complemented by mutual understanding in the field to allow collaboration inside the innovation ecosystem (Hwang & Horowitt, 2012).

Proposition 3 - *The institutional work practices of cognitive cohesion lever the symbolic dimension of institutional logics of collaboration in innovation ecosystems.*

Beliefs, sense-making schemes, and moral foundations (Topal, 2015; Lawrence & Suddaby, 2006) are objects of the institutional work to build cognitive cohesion. The actors engage in institutional work practices of cognitive coherence to remodel moral and cultural foundations set within the organizational field (Topal, 2015). Theorizing and education are two practices that evince the dynamics of cognitive coherence through institutional work. In order to spread cultural and cognitive standards, the actors might develop abstract theories and elaborate cause-effect chains to educate their peers on skills and knowledge required to support the new institution (Lawrence & Suddaby, 2006). Therefore, this set of institutional work practices seeks to spread cultural and cognitive standards throughout the organizational field.

Discourse, terminologies, materials, and rhetoric play an essential role spreading collaborative patterns within the innovation ecosystems (Hwang & Horowitt, 2012; Brusoni & Prencipe, 2013). Even with the existence of platforms that might connect structures of offer and demand, and a system of rules that guarantee the

increasing complexity of interactions, the literature highlights the need of proper interpretation of this same set of rules (Schwartz & Bar-El, 2015) and the mutual understanding around benefits of collaboration (Hwang & Horowitt, 2012; Hellström et al., 2015). The symbolic dimension of institutional logics (Thornton & Ocasio, 2008) reinforce cognitive and cultural patterns that sustain collaboration as a competitive organizational behavior within the organizational field. Thus, institutional work practices that seek the spread of cultural and cognitive standards might lever the establishment of discourse, terminologies, materials and rhetoric as a symbolic dimension of institutional logics that sustain collaborative behavior inside the innovation ecosystem.

In a broad sense, institutional work practices support structural, normative, and symbolic institutional logics that, in turn, constrain collaborative behavior inside the organizational field of innovation ecosystems. The connection between different perspectives of organizational institutionalism is an attempt to reply to the literature call on elaborating the interplay between institutional logics and institutional work perspectives (Zilber, 2013). Nevertheless, it is worth mentioning that the institutional logics perspective is applied as a way to synthesize the outcomes of institutional work practices. Thus, the core outlook resides on the definition that sustains that institutional work practices might illuminate the endeavors of institutionalization. Figure 02 portrays the framework about how institutional work practices foster collaboration inside innovation ecosystems.

Figure 2 - Research framework: institutional work to enhance collaboration inside innovation ecosystems
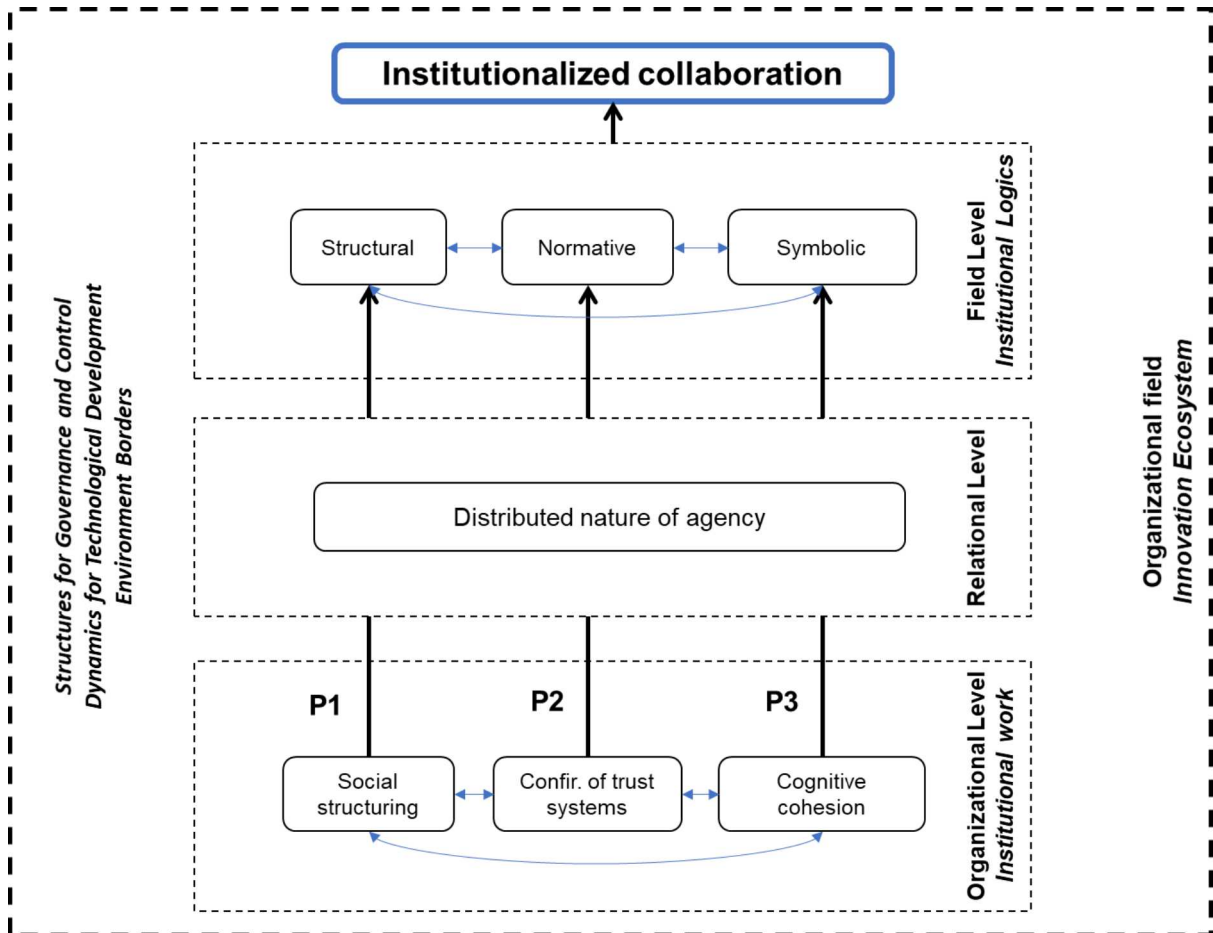
Source: elaborated by the author based on Lawrence and Suddaby, 2006; Empson, Cleaver and Allen, 2013; Thornton and Ocasio, 2008; Thomas and Autio, 2014.

The framework settles over four assumptions arising from the perspectives that set up the theoretical background of this dissertation. The first assumption, in line with the institutional logics approach (Thornton & Ocasio, 2008), argues that institutionalized collaboration embeds in the organizational field of the innovation ecosystem. Although this institution, *per se* the collaborative behavior, competes and coexists with others within this organizational field – *i.e.,* competitive behavior, technological development process, entrepreneurship (Song, 2016; Hwang & Horowitt, 2012) – the framework delimits the analysis on the dynamics to support collaboration. The organizational field comprises three elements to distinguish the innovation ecosystem from other concepts of innovative environments (Thomas & Autio, 2014; Mazza & Pedersen, 2004): a) structures for governance and control; b) dynamics for technological development; and c) environment borders. The existence of platforms as

structures for governance and control, the innovation as an open process, and the attachment of organizational actors to inner platforms characterize the innovation ecosystems.

The second assumption holds the analysis of the institution at multiple levels (Friedland & Alford, 1991). There are three levels defined by the framework: organizational, relational, and field. In line with the assumptions of institutional work, the focus on practices undertaken by individual or collective actors is fundamental in the institutionalization process (Lawrence, Suddaby & Leca, 2011). Practices occur at the individual level or the organizational level (Lawrence & Suddaby, 2006). Since the innovation ecosystem implies the participation of a plurality of organizational actors (Autio & Thomas, 2014), the framework starts from the organizational level to compose the analysis. Then, the relational level excels through the distributive nature of the agency in institutional work (Empson, Cleaver & Allen, 2013). Although the organizational level allows the identification of practices, their proponents are related to the point of engaging in coalitions to reinforce and guarantee the practice implementation (Hallett, 2010). Finally, collaboration in innovation environments depends on structural, normative, and symbolic elements, as shown in the literature (Hwang & Horowitt, 2012; Song, 2016; Autio & Thomas, 2014). These elements are reflected in the definition of institutional logics, therefore, at the field level.

The third assumption is the focus on practices endowed with intentionality and reflexivity by organizational actors (Lawrence & Suddaby, 2006). This assumption is in line with the central axiom of institutional work as a theoretical perspective (Lawrence, Suddaby & Leca, 2011) that any institutionalization movement depends on practices undertaken by institutional or collective actors. The institutionalization of collaborative behavior, then, shadows this perspective. Furthermore, the focus on practices delimits the direction of the analysis. Recursion, characteristic of the embedded agency (Battilana & D'aunno, 2009), is isolated in this framework. The analysis takes place in a single direction, from institutional work practices (Lawrence & Suddaby, 2006) to institutional logics (Thornton & Ocasio, 2008).

The fourth assumption highlights the distributed nature of the agency (Empson, Cleaver & Allen, 2013). The combination of practices (Lawrence, Suddaby & Leca, 2011) and the way in which organizational actors relate to the point of shaping coalitions that reinforce their actions (Hallett, 2010) opens the way for the understanding of the interplay between institutional work practices and institutional

logic (Zilber, 2013). Thus, this assumption bridges the perspective of institutional work to the dimensions of institutional logics.

Based on these four theoretical assumptions, the framework outlines particular dynamics. Institutional work practices highlight at the organizational level (Willmott, 2011). Institutionalization occurs from the contraposition of practices that aim at the creation, maintenance, or disrupture of institutional standards (Lawrence, Suddaby & Leca, 2011). The focus on practices is the break-through of institutional work to the neo-institutional tradition.

Although institutional work practices might split typification into three groups according to their impact on institutional logic, it is worth noting that they occur in tandem, sometimes concurrently (Zietsma & Lawrence, 2010) and sometimes complementarily (Empson, Cleaver & Allen, 2013). The framework highlights the recursion between groups of practices at the organizational level to highlight its concomitant occurrence (Lawrence, Suddaby & Leca, 2009). This fact anticipates the distributive nature of the agency, observable at the relational level.

Although produced at the organizational level, it is worth recognizing the interrelationship between practices at the interorganizational level (Hallett, 2010). Recent articulations of institutional work have highlighted the need to understand the distributed nature of agency in institutional practices (Empson, Cleaver & Allen, 2013). With this, the actors are engaged continuously either to the leadership of institutional work practices or to the formation of coalitions aimed at similar intents (Lawrence, Suddaby & Leca, 2011).

At the filed level, structural, normative, and symbolic dimensions of institutional logics that might sustain the institutionalization of collaborative behavior are levered by institutional work practices (Thornton & Ocasio, 2008; Jackall, 1988). Platforms capable of connecting individuals, organizations, or projects (Autio & Thomas, 2014; Adner & Kapoor, 2010) depend on the development of formal structures that might guarantee the association of diverse actors. Also, minimum rules for interaction end up underpinning trust among entrepreneurs (Hwang & Horowitt, 2012); while the proper interpretation of this same set of rules and the cognitive cohesion of diverse organizations that might mutually understand each other's skills and demands (Schwartz & Bar-El, 2015) seem to tackle the main issues that hinder collaboration inside innovation ecosystems (Song, 2016; Autio & Thomas, 2014).

In time, the framework highlights the interplay among dimensions of institutional logic. The literature claims the inseparability and recursion of structure, norms, and symbols for a complete understanding of institutional logics (Thornton & Ocasio, 2008). This framework reflects this recursion and points to the mutual support of the three dimensions.

Finally, connection structures, rules, and norms for exchanges, and the existence of shared routines might sustain the institutionalization of collaborative behavior inside the innovation ecosystem. A group of practices of the institutional work, especially acknowledgeable thought the distributed nature of agency, ends up acting precisely on these institutional logics' dimensions.

4 METHODS

This dissertation set the objective of producing and sustaining a theoretical-conceptual framework capable of demonstrating how institutional work practices foster collaboration in innovation ecosystems. Based on the theoretical precepts of institutional work (Lawrence, Suddaby & Leca, 2009) and its impact on institutional logics (Thornton & Ocasio, 1999), this dissertation analyzed the cases of Sophia Antipolis, in France, and Tecnosinos, in Brazil, as innovation ecosystems.

Sophia Antipolis, as an innovation ecosystem, was developed through the public policy of *Technopoles* implemented in Europe from the 1960s on (Perrin, 1988; Ter Wal, 2013). The Technopole Sophia Antipolis was founded in 1969 in southern France, in the region presently known as Provance-Alpes-Cotê d'Azur, to host R&D departments of national and international corporations (Longhi, 2002). Over the subsequent few decades, public and private universities and research centers have settled in the region (El Idrissi & Huach, 2003). Along with government policies to stimulate technological development, such as the *pôles de competitivité*, Sophia Antipolis's innovation ecosystem has evolved into the platform model (Autio & Thomas, 2014), centered on two hubs - *i.e.,* the Business Pole and SophiaTech.

Organizational collaboration in Sophia Antipolis is acknowledgeable through collective projects, joint technology development projects, or the proximity among startups and large corporations (Parker, 2010). The collective projects are part of the operational model of the *pôles de competitivité* as a public policy. Under this model, regional, national, or European funds are applied to projects that bring together the participation of SMEs, large companies, and public research laboratories (Longhi & Rainelli, 2010). Research centers are also part of other evidence of collaboration in Sophia Antipolis. Independent projects between large companies – *i.e.,* Amadeus, Thales, Hawlett Packard – and research centers – *i.e.,* INRIA, EURECOM – seek joint technological development. Finally, the proximity among startups that develop solutions for process improvement of large companies is another evidence of collaboration observed in Sophia Antipolis.

Tecnosinos portrays a more recent development history. It was established in 2001 based on the alignment between university, industry, and public power for the construction of a *Polo de Informática*, a region to house the nascent information technology industry (Bittencourt, 2019; Zapata & Cantú, 2016). Although formally

represented by the São Leopoldo City Hall, the government participation is less representative in Tecnosinos, whereas the link with the university – *i.e.,* UNISINOS University – is fundamental for understanding the dynamics of the ecosystem. Actors directly linked to the university take the burden of undertaking the primary practices of institutional work observed in this case.

The organizational collaboration in Tecnosinos is observed in actions for the development of human capital resources in the environment (Maldaner & Rucker, 2019) and the development of technological solutions (Faccin & Balestrin, 2017; Schmidt, 2013). The development of human capital is a recurring challenge in narratives observed in Tecnosinos. University, government, and large companies in the ecosystem jointly conduct community engagement programs and the spread of technology-driven opportunities (Maldaner & Rucker, 2019). The specific dynamics of technological development also reflect the collaboration in Tencosinos. Technological solutions for the health sector developed though the approximation between hospitals or health services in the region and startups settled in the ecosystem. Besides, joint technology development projects are observed between the technology institute and a large semiconductor company (Faccin & Balestrin, 2017).

In order to achieve its objective, this dissertation adopted the alignment between ontology, epistemology, and the methodological protocol (Milliot, 2015). This study portrays the analysis between two innovation ecosystems inserted in different institutional contexts. As institutional work practices are conducted by actors embedded in a set of cultural and cognitive standards (Lawrence, Sudabby & Leca, 2009), this study considered the critical realism as ontological standards (Welch et al., 2011). This ontology allows analysis under causal structures and contextualized reality.

The epistemological project assumed in this dissertation claims to be praxeological. Knowledge arises from practices and the effectiveness of these same practices. Praxeology brings the action as a goal-directed human behavior, purposely performed, and under the free will of the subject of action (Gasparski, 1987). The voluntarist characteristic of institutional work (Lawrence & Suddaby, 2006) aligns with praxeological epistemology.

The epistemological project also sustains that this dissertation is explanatory. Addressing the objective of demonstrating how institutional work practices foster collaboration requires causal explanations. A simple description of practices would not be enough to support a framework capable of explaining how such practices of

institutional work foster collaboration in innovation ecosystems. It is the causal relations between practices and institutional logics that demonstrate the dynamism of sustaining collaboration in innovation ecosystems.

Timely, this dissertation considered abductive inferences. This type of inference allows the researcher to find the most appropriate causal explanations of an unknown reality (Bertilsson, 2004). Thus, from the recognition of narratives observed in the field, it was possible to find those practices that most closely interfere in sustaining collaboration in the innovation ecosystem. On the one hand, in cases of recognized complexity, such as innovation ecosystems, deductive inferences are unable to isolate all contextual variables in order to demonstrate with minimally acceptable significance the relationship between practices and institutional logic. On the other hand, the literature on institutional work has evolutionarily demonstrated the mapping of practices with an impact on institutional logics (*i.e.*, Lawrence & Suddaby, 2006; Topal, 2015; Cantino et al., 2017). Therefore, purely inductive inferences could fail, not recognizing the path already taken by the literature and ignore pre-existing causal relationships.

In conclusion to the paradigmatic alignment, the dissertation adopted qualitative research through a multiple case study. Previous research points out that the case study is a methodological strategy capable of demonstrating the implementation of institutional work practices in-depth (Zietsma & Lawrence, 2010; Styhre, 2014). Also, contextual complexity and the search for understanding the role of context on causal relations between practices and institutional logic are added to this research. For this reason, the multiple case study excels in this dissertation. Figure 03 portrays the paradigmatic alignment of this dissertation.

Figure 3 - Paradigmatic Alignment
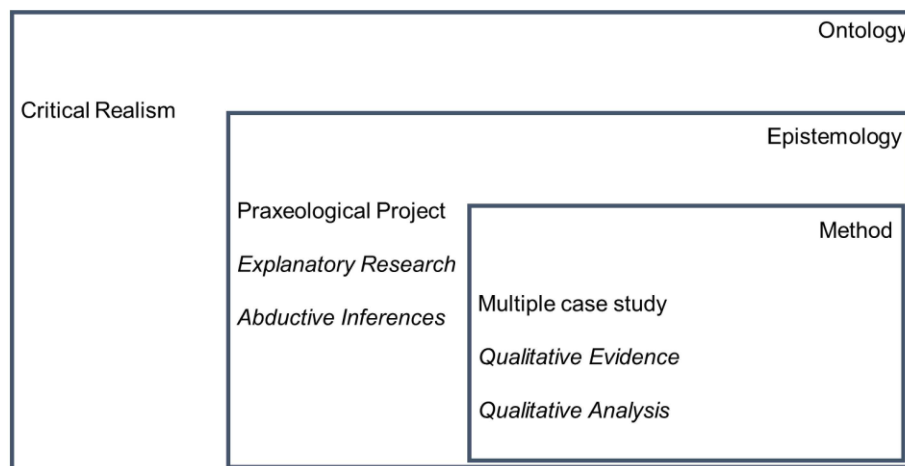
Source: elaborated by the author based on Milliot 2015.

This chapter aims to present the research design of this dissertation. Thus, it reports the methodological foundations that support and validate the study, as well as paradigmatic alignment, research delimitation, and techniques for data collection and analysis. As a synthesis, actions split into four distinct stages: a) conceptual and methodological development; b) individual case analysis; c) comparative case analysis; d) synthetic outcomes and conclusions. Figure 04 highlights the relations of each stage.

Figure 4 - Research design
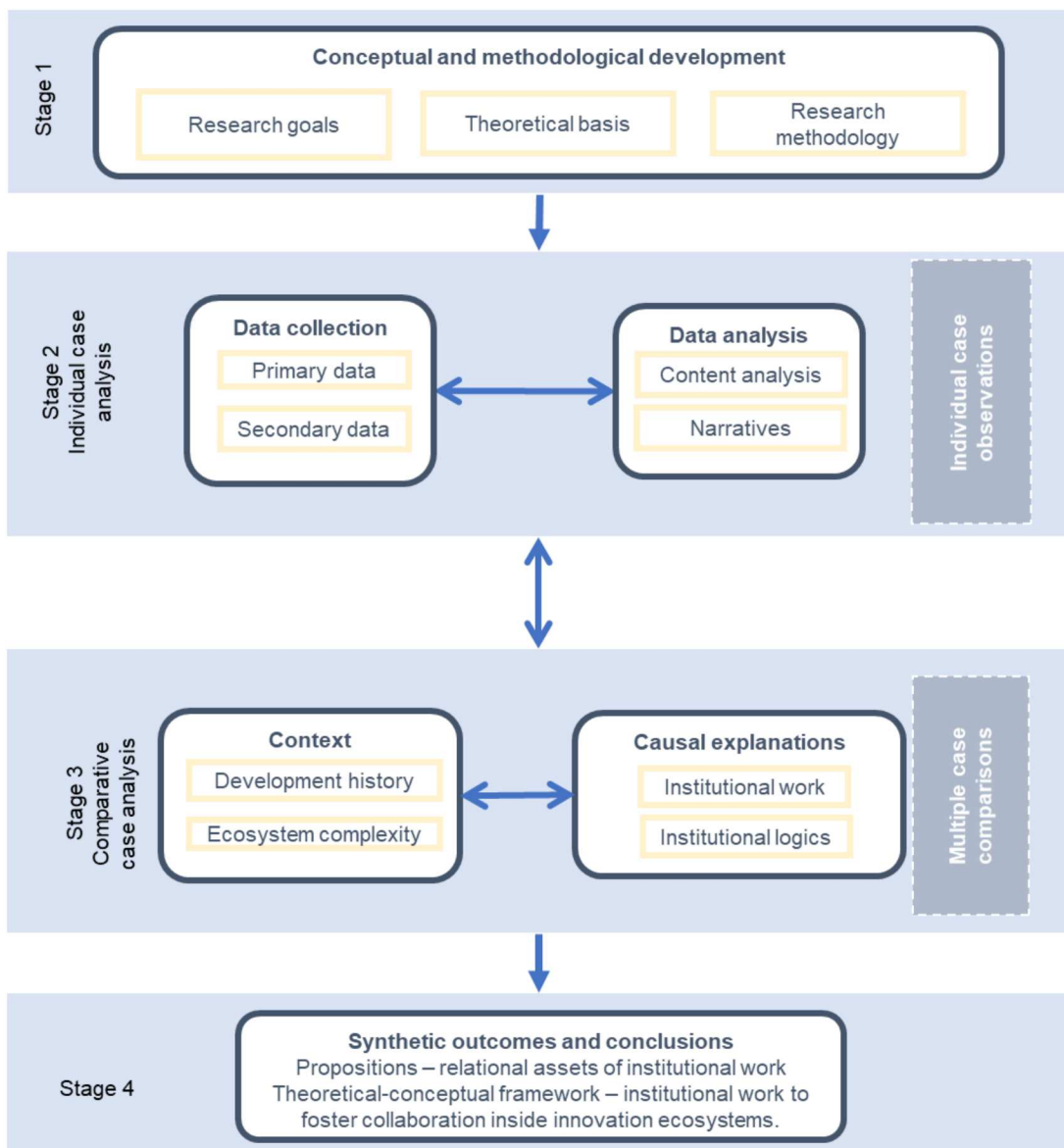
Source: elaborated by the author.

These four stages were defined in order to maintain the methodological rigor of this dissertation and allow the reader to identify the steps that led to the achievement

of the objectives. Although research design maintains a sequential logic, the stages of individual case analysis and comparative case analysis occur recursively. While comparison allowed the identification of causal relations common to both cases – supporting the three final propositions of the dissertation – the contextual characteristics allowed the production of contextual explanations in the individual case analysis.

It is worth highlighting the recursive characteristic between the sub-stages of data collection and analysis. Huberman and Miles (2002) suggest that for guaranteeing the richness of data required for qualitative research, the data collection instrument might be flexible and accept changes during the research. For this reason, these sub-stages do not occur separately, but concomitantly and constructively.

4.1 Conceptual and methodological development

The initial stage aims to define the study's rationale. The research question, as well as the objectives, have been defined, serving as the basis for all proceeding development. Nevertheless, the concepts that supported the research evolution emerged from the literature concerning innovation ecosystems, institutional work, and institutional logics. Finally, the methodological procedures allowed the achievement of the proposed objective of this dissertation.

Empirical literature in institutional work has been developed mainly through case studies under constructivist ontology (*e.g.*, Styhre, 2014; Alvarez, Young & Woolley, 2015). Under the typology proposition of Welch et al. (2011) for case studies, the majority of studies in institutional work would fit the interpretative sensemaking theorizing method. The emphasis on contextualization to describe institutional work, whereas the misregard for causal explanations (*i.e.,* Zietsma & Lawrence, 2010; Styhre, 2014), maybe a reason for this propensity for interpretative case studies.

However, as the research question points to the institutional practices aiming to foster collaboration inside the innovation ecosystem, the causal explanations must be highlighted as research outcomes. Nevertheless, context cannot be aside in an institutional work perspective. Welch et al. (2011) propose a response to this trade-off in case studies through the contextualized explanation, held under critical realism ontology – it acknowledges the existence of a reality that is independent of perceptions (realism) but also regards the comprehension of reality as theory-laden (positivism).

(Welch et al., 2011). Therefore, critical realism enables the analysis of an object both under causal laws and contextualized reality.

Milliot (2015) suggests a paradigmatic alignment to enhance theorizing potential in the case study. Besides the definition of an ontological perspective, the author suggests the definition of an epistemological project, research goals (explanatory and or descriptive), possible inferences (induction, deduction and/or abduction), and the methodological protocol.

As an epistemological project, this study claims to be praxeological. Institutional work reverses the agent/agency interaction traditionally adopted in institutional theory (Willmott, 2010). From this perspective, every institutional variation, whether for creating, maintaining, or disrupting institutions, is carried out by practices conducted by actors with intentionality and reflexivity (Lawrence, Suddady & Leca, 2009; Deroy & Clegg, 2015). This theoretical positioning strictly talks to praxeology as an epistemological foundation (Gasparski, 1987). This research sheds light on practices with intentionality and their respective effects.

This research claims to be explanatory since it proposed the analysis of causal relationships between institutional work practices and institutional logics. It is worth to recall that this positioning is recent as it goes against the traditional focus on contextualizing brought by institutional work literature (i.e., Zietsma & Lawrence, 2010; Styhre, 2014). Thus, as practices arose from organizational level observations, their relations with dimensions of institutional logics at the filed level of analysis were also mapped. As a result, the findings of this dissertation are explanatory.

The study was conducted based on abductive inferences. The research initially sought to recognize causal relationships already mapped by the literature - *i.e.,* social structuring practices on structural logics (Lawrence & Suddaby, 2006; Waldron et al. 2015; Thornton & Ocasio, 1999); practices of configuring belief systems on normative logics (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010; Thornton & Ocasio, 1999); cognitive cohesion practices on symbolic logics (Lawrence & Suddaby, 2006; Topal, 2015; Thornton & Ocasio, 1999). Then, over these sets of practices, the research sought to understand how these constructs empirically reflect the action of organizational actors in the quest to foster collaboration in the innovation ecosystem. As a result, the research presents 21 institutional work practices that most appropriately reflect the support of institutional logics as pillars for institutionalized collaboration in the field.

As a methodological protocol, the study consisted of qualitative research. Among the strategies adopted for these matters, the case study seems to be the fittest to the objective of proposing a theoretical-conceptual framework regarding how institutional work practices foster collaboration in innovation ecosystems. By inducing the investigation of a specific phenomenon from the organizational, social, and political point of view, the methodological strategy applied claims the technique of the multiple case study. Similar research focusing on the trajectory of institutional changes have also applied case studies (Zietsma & Lawrence, 2010; Styhre, 2014). The development of collaboration inside innovation ecosystems boundaries is a complex empirical phenomenon. Nevertheless, the predisposition to analyze the practices undertaken by actors in this direction justifies the choice of this methodological strategy.

4.1.1 Research delimitation

Once the paradigmatic alignment of the research was defined, it was necessary to delimit the scope of the analysis. The definitions of object, phenomenon, and case support the delimitation.

In terms of research structure, this study claims to point at the innovation ecosystem as the *object of analysis*. Innovation ecosystems have recently reached empirical attention in the literature (Adner, 2006; Autio & Thomas, 2014). In this research, the innovation ecosystem shapes a complex environment based on the dynamic interactions around a platform (Autio & Thomas, 2014).

Within the innovation ecosystems, the specific *phenomenon* analyzed in this study stands as the dynamics of fostering collaboration among entrepreneurs, researchers, and the community. Free, recurrent, and purposive interaction supports the exchange of knowledge (Schwartz & Bar-El, 2015) and the joint solution of problems (Adner & Kapoor, 2010) as the primary outcome of innovation ecosystems.

In time, the *case* analyzed stands for the institutional work to foster collaboration inside innovation ecosystem boundaries. Under the analysis of this specific case, it was possible to produce a theoretical-conceptual framework that could respond to how institutional work practices foster collaboration within innovation ecosystems. Figure 05 summarizes the research delimitation.

Figure 5 - Research delimitation
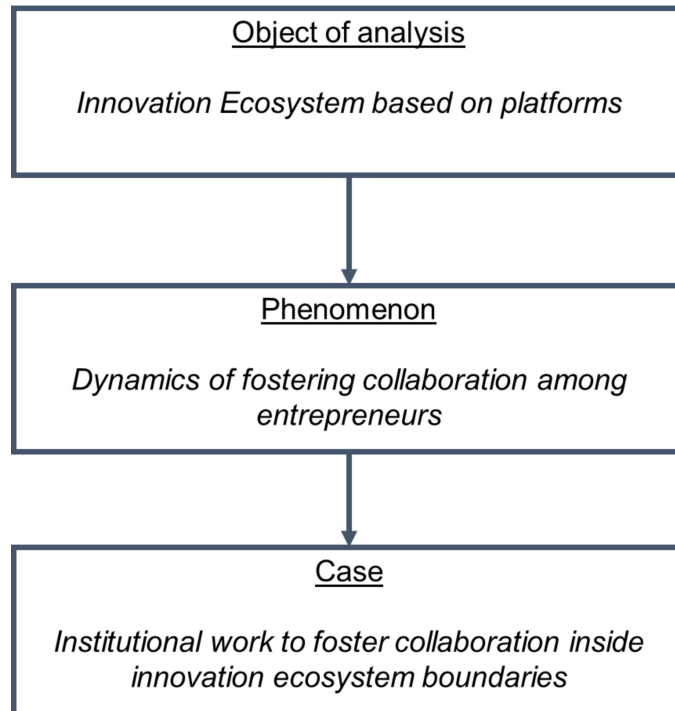
Source: elaborated by the author

The research comprises two cases inserted in different institutional contexts in order to promote contextual explanations according to critical realism ontology. The choice of cases respected fundamental elements in the literature on innovation ecosystems – platform structure and collaboration between organizational actors. Both elements aligned with the objective of this dissertation.

Platforms in innovation ecosystems are focal companies, software, hardware, hub companies, collaborative projects that aim to connect different links in the value chain (Autio & Thomas, 2014). In this research reckons the innovation center as an integrating platform in the innovation ecosystem. The characteristic of these innovation centers is to gather organizational actors from universities, research centers, entrepreneurs, government, and the community around common goals of technology development. These innovation centers are relevant as an object of study because the impact of the power centrality is lower in comparison to other platforms (Autio & Thomas, 2014), allowing to observe the participation of a plurality of actors with daily actions in developing interaction.

Collaboration is the set of relationships among actors directly linked to the platform that sustains the innovation ecosystem, undertaken to find solutions to emerging demands (Schroth & Häußermann, 2018; Thomas & Autio, 2012).

Interdisciplinary working groups, collaborative projects, communities of practice, periodic meetings are some examples of collaboration that sustain the innovation ecosystem (Song, 2016).

The selection of cases also respected the delimitation of characteristics of participation of actors and external recognition on the effectiveness of the ecosystem in technological development. These are relevant characteristics in the literature on innovation ecosystems (Song, 2016; Autio & Thomas, 2014; Adner & Kapoor, 2010), making the cases representative and justifying their choice (Yin, 2014). The object of study should include the following characteristics:

- *Legitimacy* - the innovation center should be recognized for its effectiveness and productivity, not only by its participating members but mainly outside its limits. This characteristic guarantees the choice of acknowledgeable platforms inside the innovation ecosystem. Hence, levels of collaboration within their boundaries must be recurrent and purposive (Song, 2016).

- *Participation of society* - as a center embedded in an innovation ecosystem, the innovation cluster must have a close linkage with civil society, representing the user side of a platform model (Autio & Thomas, 2016). Society has the role of driving the path of technological development, since it demands solutions to its daily problems, as well as feeding the ecosystem with knowledge and labor (Carayanis & Campbell, 2009).

- *Government participation* - one of the characteristics of the innovation ecosystem is the active participation of government agencies in financial and regulatory support. Because of their institutional legitimacy, these actors can communicate and connect the innovation center to other similar initiatives in different regions (Schwartz & Bar-El, 2015).

- *Participation of research centers and universities* - knowledge generation structures (Clarysse et al., 2014) are considered essential for the effectiveness of innovation ecosystems. This research aims to analyze the implementation of practices that develop the interaction inside innovation ecosystem boundaries, then the active and recurrent participation of these organizations points to the search for resource complementarity to implement knowledge into daily activities (Jiao et al., 2016).

Research delimitation anchored the construction of methodological procedures. The procedures for data collecting and analysis are in line with the paradigmatic alignment and research delimitation.

4.1.2 Data collection

Given the participation of several actors identified in the literature as responsible for the dynamics of an innovation ecosystem (Autio & Thomas, 2014), empirical data should emerge from the perception of this plurality of actors concerning the process in which they embed. Data were collected from primary sources – semi-structured interviews and non-participant observation – as well as secondary sources – reports and digital organizational advertising. This combination of data collection techniques is characteristic of the case study, where files, interviews, questionnaires, and observations are standard (Eisenhardt, 1989).

Data collection was initially prepared from theoretical and conceptual definitions emerging from the literature review. Table 06 unfolds theoretical-conceptual axes into constructs.

Table 6 - Constructs of theoretical-conceptual analysis

Axis	Constructs
Institutional work dimensions	Institutions Actors Agency
Institutional work practices	Social structuring Configuring of trust systems Cognitive cohesion
Dimensions of institutional logics	Structural Normative Cognitive
Context of innovation ecosystems	Governance Dynamics Limits

Source: elaborated by the author.

The literature on institutional work produces two primary theoretical-conceptual axes for this dissertation. First, the fundamental characteristics of institutional work as a unique theoretical perspective help to define institutions (Lawrence, Suddaby & Leca, 2011), actors (Willmott, 2011), and agency (Fuenfschilling & Truffer, 2016; Paroutis & Heracleous, 2013) in the cases analyzed. Second, the literature on institutional work elucidates types of practices that support the institutionalization process. It is worth mentioning that, although the literature is useful in the definition of institutional work

practices, the researcher selected only a typification of practices with the potential to impact fostering collaboration in innovation ecosystems for this analysis. Thus, social structuring practices (Lawrence & Suddaby, 2006; Waldron et al., 2015), configuration of belief systems (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010) and cognitive cohesion (Topal, 2015; Lawrence & Suddaby, 2006) form the elements of analysis arising from the axis of institutional work practices. These two dimensions delimit the analysis because of their potential to elucidate how institutional work practices foster collaboration in innovation ecosystems.

The literature on institutional logics provides the third theoretical axis of analysis for this dissertation. The dimensions of institutional logics unfold into the constructs of a structural, normative, and cognitive dimension (Thornton & Ocasio, 1999). These three constructs were selected because of their potential to demonstrate how the institution might be sustained.

The last theoretical-conceptual axis comes from the literature on innovation ecosystems. Three constructs report the characteristics to differentiate innovation ecosystems from other innovation environments observable in the literature - *i.e.,* entrepreneurial ecosystem (Feld, 2012; Audretsch & Belitski, 2016); technology parks (Link & Scott, 2007; Díez-Vial, 2015); quadruple helix (Carayannis & Campbell, 2009; Carayannis & Rakhmatullin, 2014); regional innovation systems (Cooke et al., 1998; Clarysse et al., 2014). Thus, governance, operating dynamics, and limits were constructs applied to the analysis. These constructs help the delimitation and characterization of the context in which each innovation ecosystem grounds.

The data collection techniques were structured to cover all theoretical-conceptual axes. The techniques were overlaid, so each axis is supplied by data collected from at least two different techniques. All three data collection techniques covered institutional work practices. This option is due to the centrality of practices in research since the objective of this dissertation depends on explanating the dynamics and effectiveness of these practices. Furthermore, the adopted epistemological project, based on praxeology, justifies data triangulation to define the effectiveness of institutional work practices. Although respondents understand that their actions may influence the fostering of collaboration in the ecosystem, non-participant observation, and secondary data help to shed light on this impact. Figure 06 portrays the interrelationship between data collection techniques and the theoretical-conceptual axes of the research

Figure 6 - Data collection techniques on theoretical-conceptual axes
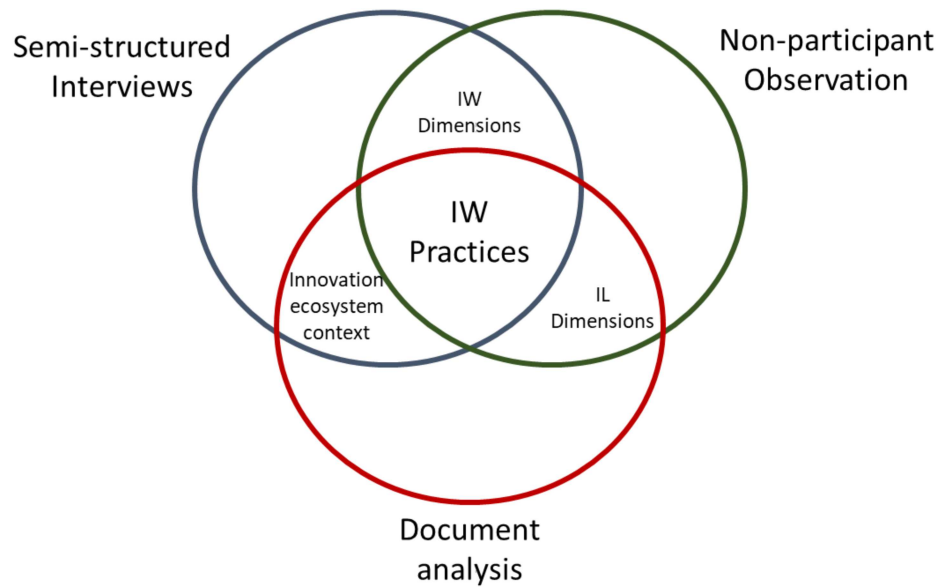
Source: elaborated by the author.

The interposition of data collection techniques ensured the appropriation of those practices that more precisely explain the fostering of collaboration within the innovation ecosystem. Initially, data were collected through semi-structured interviews. Respondents were encouraged to narrate how collaboration was fostered inside the innovation ecosystem. Through these narratives, it was possible to observe the practices of institutional work. The practices, and their corresponding impact, were validated from field notes produced based on non-participant observation of events promoted by organizational actors settled in the innovation ecosystem. This technique was used in order to validate symbologies, discourse, physical structures that reflected the effectiveness of the practices quoted in the interviews. Then, the evidence on the practices was further validated, employing secondary data collected in technical-managerial reports and digital material produced to publicize the organizational actors settled in the ecosystem. The application of this technique allowed the validation of symbols, terms, norms, and rules applied to the institutional work practices.

Semi-structured interviews and non-participant observation covered the axis of institutional work dimensions. The purpose of this overlap was to initially identify the characteristics of institutions, actors, and agencies from the perception of the agents themselves in semi-structured interviews. Respondents were encouraged to answer how they observed collaboration in the field, who are the main actors linked to actions to support collaboration, and what are the actors' capacity for action. These

perceptions were validated with the non-participant observation of events aimed at the entrepreneurial public.

Secondary data and non-participant observation covered the axis of institutional logics dimensions. The data on this axis were initially collected through the researcher's access to technical-managerial reports published by the main organizational actors in both innovation ecosystems, in addition to digital materials for presenting the actors. These data allowed the identification of structures, norms, and symbology that fostered collaboration in the ecosystem. The field notes produced through non-participant observation of events promoted by the organizational actors of both ecosystems allowed the validation of these data collected initially.

Finally, the axis referring to the context of innovation ecosystems was covered by primary data through semi-structured interviews and secondary data through the documental analysis of reports and digital advertising material of the main actors of the ecosystem. For this axis, data were initially collected through semi-structured interviews, where respondents were encouraged to describe governance, operating dynamics, and limits of the ecosystem. This description was validated by data collected in technical-managerial reports and digital advertising material from the main actors in the ecosystem.

4.1.2.1 Semi-structured interviews

Semi-structured interviews are appropriate when there is a clear objective to develop an understanding of the respondent's world and when the chain of actions in a situation is unclear. As already mentioned in the preceding subsection, semi-structured interviews, as a primary data collection technique, allowed elucidating institutional work practices, in addition to contextual characteristics of innovation ecosystems and fundamental dimensions of institutional work.

The semi-structured script of the interviews comprised questions through the unfolding of theoretical-conceptual constructs of this dissertation. Table 07 presents the deployment at the third level of variables.

Table 7 - Unfolding of theoretical and empirical constructs

Axis (1st level)	Constructs (2nd level)	Variable (3rd level)	Authors
Institutional work dimensions	Institutions	Cultural patterns Cognitive patterns Normative standards	Meyer & Rowan (1977); Lawrence, Sudabby & Leca (2011); Jepperson (1991); Aldrich & Fiol (1994)
	Actors	Legitimacy Power of action	Lawrence, Sudabby & Leca (2009); Lawrence & Suddaby (2006)
	Agency	Reflexivity Intentionality	Lawrence, Leca & Zilber (2013); Dover & Lawrence (2010); Paroutis & Heracleous (2013)
Institutional work practices	Social structuring	Politic and regulatory support; Connection among actors with distinct social positions; Social mobility.	Lawrence & Suddaby (2006) Empson, Cleaver & Allen (2013) Waldron et al. (2015) Zietsma & Lawrence (2010).
	Configuring of trust systems	Construction of rules system; Property rights; Definition of boundaries to the organizational field	Lawrence & Suddaby (2006) Zietsma & Lawrence (2010)
	Cognitive cohesion	Moral foundation; Cultural convergence; Development of signs; Education of actors.	Lawrence & Suddaby (2006) Topal (2015)
Context of innovation ecosystems	Governance	Platform characteristics; Pre-existent relationships; Structure of connections	Autio & Thomas (2014); Song (2016); Adner & Kapoor (2010); Dubina et al. (2017); Siqueira, Mariano & Moraes (2014); Schwartz & Bar-El (2015).
	Dynamics	Interaction effectivity; Interaction recurrence; Rules and norms for exchange.	
	Boundaries	Government; University; Industry; Civil society; Mutual understanding.	

Source: elaborated by the author.

The theoretical-conceptual axes of this research, once deployed into constructs, give rise to variables that might be empirically observable. In this way, nine constructs related to dimensions of institutional work, institutional work practices, and contexts of innovation ecosystems split into twenty-eight variables.

The variables referring to the theoretical-conceptual axis of the dimensions of institutional work are seven. *Cultural patterns*, *cognitive patterns,* and *normative standards* stand out as potential variables in the identification and characterization of the institution observed in the field. It is worth mentioning that the concept of institution

in institutional work as "those (more or less) enduring elements of social life that affect behavior and beliefs of individuals and collective actors by providing templates for action, cognition and emotion" (Lawrence, Suddaby & Leca, 2011, p.53), is supported by organizational institutionalism. For this reason, the base of authors recalls Meyer & Rowan (1977); Jepperson (1991) and Aldrich & Fiol (1994).

The characterization of the actors unfolds into two variables. Institutional work defines the actor as that individual or group of individuals with *legitimacy* (Lawrence, Suddaby & Leca, 2009) and *power of action* (Lawrence & Suddaby, 2006) to participate in the institutionalization process. Finally, the agency, as a relevant discussion in the literature on institutional work, gave rise to two other variables. Human action in institutional work ground on *reflexivity*, as the actor's ability to recognize the impact of its performance (Lawrence, Leca & Zilber, 2013), and *intentionality* as a physical and cognitive effort towards a specific goal (Dover & Lawrence, 2010).

The theoretical-conceptual axis of institutional work practices deployed into ten variables. Practices are observed due to their impact on maintaining of creating institutions. As the objective of the research was centered on fostering collaboration, practices of institutional disruption would not be sufficiently elucidative. Thus, the literature highlights practices of *political and regulatory support* (Lawrence & Suddaby, 2006); *connection among actors with distinct social positions* (Empson, Cleaver & Allen, 2013; Zietsma & Lawrence, 2010) and *social mobility* (Waldron et al., 2015) with potential impact on social structuring to support an institution. Practices with an impact on the configuration of trust systems reflect the *construction of rules systems*, *property rights* (Lawrence & Suddaby, 2006) and *definition of boundaries to the organizational field* (Zietsma & Lawrence, 2010). Finally, cognitive cohesion is impacted by practices of *moral foundation* (Topal, 2015), *cultural convergence*, *development of signs,* and *education of actors* (Lawrence & Suddaby, 2006).

The theoretical-conceptual axis of the context of innovation ecosystems is split into eleven variables. It is worth mentioning that while these variables characterize the innovation ecosystem, they give it an identity and differentiate it from other innovation environments recognized in the literature. Ecosystem governance is identified by *platform characteristics* (Autio & Thomas, 2014); *connection structures* (Adner & Kappor, 2010); and *pre-existing relationships* (Dubina et al., 2017). The dynamics of the ecosystem is based on interorganizational relationships, therefore *effectiveness* (Song, 2016) and *recurrence of interaction* (Adner & Kapoor, 2010), in addition to the

rules and norms (Siqueira, Mariano & Moraes (2014) that guarantee exchanges form the variables for this construct. Finally, the limits of the ecosystem are based on the definition of actors – *i.e., government, university, industry,* and *civil society* (Autio & Thomas, 2014; Schwartz & Bar-El, 2015) – in addition to the *mutual understanding* between these actors (Hwang & Horowitt, 2012).

The set of variables supported the construction of the semi-structured interview script. The script was written in Portuguese (Appendix A) and French (Appendix B), respecting the origin of the respondents. A version of the script was translated into English (Appendix C) to allow the reader to analyze the proposed questions.

The questions were structured to stimulate the narrative. Respondents were encouraged to narrate situations they had experienced in the innovation ecosystem. This technique makes it possible to unveil not only the practices of institutional work but the intentionality and reflexivity of the actors (McGivern et al., 2015).

The semi-structured interviews were conducted with representatives of organizational actors embedded in the innovation ecosystem. Twenty representatives settled in Sophia Antipolis, and fifteen representatives settled in Tecnosinos were interviewed. As the objective of the interviews was to map the practices undertaken by organizational actors, it was defined as a priority that the group of respondents should be formed primarily by mid-level managers, due to their ambivalent perception between the organization's strategic guidelines and operations breakdown. Even so, for some organizational actors, it was necessary to interview a second respondent when the first one indicated other names of the organization itself that could deepen a specific topic. Thus, the group of respondents is formed by 17 organizational actors in Sophia Antipolis and 12 in Tecnosinos.

Respondents were initially selected based on the indication of specialists in both cases. Initially, three respondents were nominated in Sophia Antipolis and two respondents in Tecnosinos. From these initial interviews, respondents were encouraged, at the end of the interview, to indicate those organizational actors that were strictly linked to actions to foster collaboration in the ecosystem. Data collection ended as the nominations did not contain any new potential respondent names.

In order to preserve the respondents' freedom of response, in addition to ensuring that the data collected was reliable to reality, a Confidentiality Agreement was applied (Appendix D and E). The researcher and all interviewees signed the agreement. Thus, the names of the interviewees are preserved.

Respondents were randomly numbered in two groups – *i.e.,* Sophia Antipolis and Tecnosinos – in order to preserve the identity and ensure the confidentiality of their reports. Table 08 presents the minimum characteristics of the interviewees and the date of the interviews.

Table 8 - Chart of interviewees

Case	Organizational actor	Managerial level	Interview date	Code
Sophia Antipolis	Eurobiomed	Mid-management	30/out/2018	SA01
	Pole SCS	Mid-management	26/out/2018	SA02
	Pole SCS	Direction	26/out/2018	SA03
	Telecom Valley	Direction	26/out/2018	SA04
	CCI Nice Cote d'Azur	Mid-management	20/dez/2018	SA05
	Village by CA	Mid-management	20/dez/2018	SA06
	French Tech Cote d'Azur	Mid-management	20/dez/2018	SA07
	Fondation Sophia Antipolis	Direction	18/dez/2018	SA08
	Incubateur PACA Est	Direction	18/dez/2018	SA09
	Université Nice Cote d'Azur	Professor	17/dez/2018	SA10
	Pepinière CASA	Direction	17/dez/2018	SA11
	Universite de Nice Sophia Antipolis	Professor	14/dez/2018	SA12
	Universite de Nice Sophia Antipolis	Professor	14/dez/2018	SA13
	Communauté d'Agglomeration Sophia Antipolis - CASA	Mid-management	05/nov/2018	SA14
	Universite de Nice Sophia Antipolis	Professor	19/dez/2018	SA15
	SYMISA	Direction	26/out/2018	SA16
	Team Côte d'Azur	Mid-management	30/out/2018	SA17
	Fond PACA Emergence	Mid-management	26/out/2018	SA18
	Paris Tech	Mid-management	26/out/2018	SA19
	Sophia Club Entreprises	Direction	26/out/2018	SA20
Tecnosinos	UNISINOS	Professor	02/mai	TS01
	UNISINOS	Direction	29/mar	TS02
	ACIST-SL	Direction	30/set	TS03
	SAP	Mid-management	21/out	TS04
	Valencia	Direction	21/out	TS05
	ACIST -SL	Mid-management	28/out	TS06
	SKA	Mid-management	04/nov	TS07
	Portal de Inovação	Direction	03/dez	TS08
	ITT	Mid-management	04/dez	TS09
	ITT	Mid-management	04/dez	TS10
	META	Mid-management	22/out	TS11
	REGINP	Direction	16/out	TS12
	Associação do Polo de Informática	Direction	04/nov	TS13
	Desto	Direction	22/out	TS14
	Digistar	Mid-management	28/out	TS15

Source: elaborated by the author.

The interviews were conducted in person between October 2018 and December 2019. The average duration of the interviews was 45 minutes, even though seven interviews exceeded 60 minutes.

The interviews on the Sophia Antipolis case were concentrated in two periods of data collection. The first period - October 22 to November 5, 2018 - was carried out focusing on initial interviews, where issues of contextualization of the ecosystem were more stressed. During this period, field notes were also produced from the researcher's perceptions of the ecosystem's present structures and behaviors. During the second period - December 10 to December 22, 2018 - complementary interviews with a greater focus on institutional work practices were conducted. During this period, the researcher participated as a listener in events promoted by organizational actors in the ecosystem.

The interviews on the Tecnosinos case took place throughout 2019, between March and December. During this period, 12 visits to the ecosystem were carried out to conduct the interviews and produce field notes based on non-participant observation in events promoted by organizational actors.

4.1.2.2 Non-participant observation

Observation as a data collection technique allows the researcher to access direct data, free of interpretation by third parties (Slack & Rowley, 2001). The objective of using this technique inside this dissertation is twofold. Firstly for the validation of the data collected in the semi-structured interviews and, secondly, as a support for the description of dimensions of institutional logics linked to collaboration in innovation ecosystems.

The researcher observed four events held by organizational actors in innovation ecosystems. The researcher's invitation to participate in these events was made during the interviews as a way of illustrating the practices. The events took place during the period of semi-structured interviews. Table 09 summarizes the main characteristics of these events.

Table 9 – Non-participant observation events

Case	Event	Organizer	Participants	Date
Sophia Antipolis	Remise de prix PME Innovant du Numérique SUD 2018	Région Provence-Alpes-Coté d'Azur	Startups ; Corporations ; Reserach center ; *Pôle de competitivité.*	19/dec/2018
Sophia Antipolis	The international Startup Seminar	*Pôle de competitivité* SCS	Startups; Entrepreneurs; Pepinière d'entreprise; Incubator; University.	19/dec/2018
Tecnosinos	Visit to the Tecnosinos Ecosystem	UNISINOS University	Researchers; Students; Entrepreneurs; *Portal de Inovação;* Incubator; ITT	25/apr/2019
Tecnosinos	Portas Abertas Tecnosinos	UNISINOS University	Incubator; Startups; Entrepreneurs.	08/jul/2019

Source: elaborated by the author.

Both events observed in the Sophia Antipolis case were sequentially held on December 19, 2018. The first event, held annually, refers to the award for outstanding startups in the ecosystem. The *Prix PME Innovant du Numérique SUD* is carried out by the regional government *Provance-Alpes-Côte d'Azur*, and organized in partnership with large companies and research centers of the ecosystem. During the event, notes were produced on discourses recognizing collaboration between organizational actors to support the creation of startups in the ecosystem, as well as the definition of priority technological drivers in the ecosystem.

The second event, *The International Startup Seminar*, was held to discuss emerging issues in the management of startups. The primary audience was formed by entrepreneurs but also managers of large companies, students, and researchers attached to universities and research centers. Concerning this event, field notes were produced on discourses, use of symbologies, and the way the event was carried out. The interaction between the different groups of spectators and speakers was also observed.

For the Tecnosinos case, the researcher observed two events aimed at bringing the public closer to the ecosystem. At the first event, held on April 25, 2019, researchers from the UNISINOS Business School were invited to meet and interact with the technological development structures installed in the innovation ecosystem.

During this event, notes were produced on the discourse of Tecnosinos as an innovation ecosystem, in addition to the observation of physical structures that host the interaction among startups, large companies, universities, and research centers.

The second event observed in the Tecnosinos case – *i.e., Portas Abertas Tecnosinos* – is an event that seeks to present business development opportunities. The target audience of this event is potential entrepreneurs, such as students, researchers, or people with some business ideas, who seek to develop their idea in the innovation ecosystem. Notes on discourse presenting the ecosystem, symbology, and dynamics of interaction between entrepreneurs were produced.

All events observed in both cases are recurrent. Therefore, they are examples of recurring spaces of interaction between actors in the ecosystem. The events, primarily based on the discourse of the ecosystem presentation, were relevant to elucidate mainly the structural, normative, and cognitive dimensions of institutional logics, in addition to institutional work practices to foster collaboration.

4.1.2.3 Document analysis

The collection of documents as a research technique translates into the search and integration of any documents as sources of data and information for research. Documents can be any physical or electronic artifacts, standardized or not, that are capable of providing some data that is useful for the researcher. The documents in this dissertation were used to validate data on institutional work practices and contextual characteristics of the innovation ecosystem collected from semi-structured interviews, and also to describe the dimensions of institutional logics that reflect institutionalized collaboration in innovation ecosystems.

Documents were collected in the form of institutional websites, management reports, news, books, and pictures that could elucidate collaboration in innovation ecosystems. Table 10 summarizes the characteristics of documents collected for document analysis.

Table 10 - Documents applied in the research

Case	Document	Source	Quantity
Sophia Antipolis	Institutional websites	Internet	22
	Managerial reports	Interviewees	11
	News	Internet	34
	Pictures	Researcher / internet	23
	Books	Interviewees	2
Tecnosinos	Institutional websites	Internet	15
	Managerial reports	Interviewees	6
	News	Internet	29
	Pictures	Researcher / internet	19

Source: elaborated by the author.

Institutional websites were applied to validate responses on objectives and the positioning of the organizational actor in the innovation ecosystem. The websites of all the respondent organizational actors were used in the documentary base, but also of adjacent organizations, mentioned during the interviews. Clippings from institutional sites are eventually presented in this dissertation, in subsequent sections.

During the interviews, respondents sometimes used managerial reports to exemplify the actions of the organizations they represented, and also other actions carried out by partners in the innovation ecosystems. Initially, it was not the purpose of the interviews to collect this type of data. Respondents spontaneously cited and provided these reports. The managerial reports made up the documentary database for this dissertation due to the validity of the responses collected during the interviews.

News published by regional or national editors was also collected as a way of validating the data collected through interviews and non-participant observation. All news material was collected digitally. The news was sought to validate a significant event or episode presented in the respondents' narratives.

Photographs comprised pictures produced by the researcher or pictures collected digitally - *i.e.,* institutional websites and news websites. The pictures were used mainly to illustrate structures and symbologies mentioned in interviews or observed in the events in which the researcher participated as a listener.

Finally, two books cited by respondents in the Sophia Antipolis case were included in the documental basis for analysis. These books reveal the development history of the *techopole* and gather scientific articles on the collaboration and formation

of interorganizational networks in the ecosystem of Sophia Antipolis. These books were used mainly to validate data on the contextualization of the innovation ecosystem.

Paradigmatic alignment, research delimitation, and definition of data collection techniques made up the first methodological stage of this dissertation. The data analysis step unfolds into two stages: individual case analysis and comparative case analysis. Although they were carried out sequentially, stages 2 and 3 are recursive.

4.2 Individual case analysis

In line with the objective of this research as to provide a framework of practices endeavored by organizational actors aiming at fostering collaboration inside innovation ecosystems, the second stage of the methodological protocol stands for the analysis of both cases separately. The objective of this stage is to promote an initial perspective of causal explanations embedded in institutional contexts.

The literature highlights the content analysis as a technique to analyze institutional work practices (*i.e.,* Zietsma & Lawrence, 2010; Empson, Cleaver & Allen, 2013; Sthyre, 2014). Its enlightening potential is capable of defining not only the practices themselves but the intentionality, reflexivity, and effort of individuals in achieving them. Furthermore, as the most substantial volume of data in this dissertation comprised the transcripts of semi-structured interviews, the content analysis technique makes it possible to understand in-depth how respondents interact between their actions and their perception of reality.

The data were analyzed according to their content (Bardin, 2011), as a set of techniques for analyzing communications, through systematic and objective procedures for describing the content of messages. Among the proposed techniques, Bardin (2011) identifies the categorical analysis as the one referring to the discourse of the subjects researched in categories, whose criteria of choice and delimitation are guided by the dimension of the investigation of the themes related to the research object. This study claimed to use categorical analysis.

The operationalization of the content analysis technique comprised three phases: a) pre-analysis; b) material exploration and; c) treatment and interpretation of results. The pre-analysis aimed to organize the data obtained, choosing the recurrence rules and defining the analysis categories, the latter being the central point of the content analysis. The category analysis was done by differentiating the constituent

elements of the research object and their regrouping considering common characteristics of these elements (Bardin, 2011).

In the phase of the material exploration, the researcher organized the primary and secondary data. The recorded interviews were transcribed into individual text files for each of the respondents. Then, the secondary data were grouped according to their profile: institutional websites, managerial reports, news, pictures, and books. This data set was inserted in the WebQDA software to support the analysis.

The last phase – *i.e.,* treatment and interpretation of results – was combined with the technique of analyzing narratives (Gioia, Corley & Hamilton, 2013). Once the respondents brought narratives about fostering collaboration within the innovation ecosystems, the researcher sought to identify through these narratives, firstly concepts and finally theoretical constructs in coherence with the structure of theoretical-conceptual axes presented in table 07. This combination of techniques finds a parallel in the literature on institutional work (*e.g.,* Mc Givern et al., 2015).

In this phase of individual case analysis, the narratives split into two groups, according to each case. Table 11 provides examples of the theorizing process based on narratives in both cases.

Table 11 - Theorization through narratives

Example of narrative about Sophia Antipolis	First-order concepts	Second-order construct	Aggregate codes	Case
"At this table [committee of the Syndicat Mixte de Sophia Antipolis], all decisions that will impact Sophia Antipolis are made out."	Governing	Advocacy	Social structuring	Sophia Antipolis
"[the project for launching an AI center] was taken to the SYMISA committee for political support. The technical details of the project were not discussed there, but certainly, the committee played an important role in legitimizing the project."	Defining strategic drivers			
"The incubator is responsible for the first step in hosting the innovative idea that might come from researchers and entrepreneurs from public universities and research centers or the private market."	Chaining	Connection among actors with distinct positions		
"The Secretary of Science and Technology of the State Government has a program of parks and incubators in the Rio Grande do Sul, so there is a way to be part of it. Public policies that can help facilitate business are built there."	Building public policies	Advocacy	Social structuring	Tecnosinos
"When space is lacking or when someone wants to expand [...], negotiations begin to make investment feasible. This process is long but resolute."	Governing			

Source: elaborated by the author.

The individual analysis of the Sophia Antipolis case distinguished nine narratives that demonstrate how practices carried by organizational actors led to an institutional environment that fosters collaboration in the innovation ecosystem. These narratives bring about the construction and use of ecosystem integration structures; and the definition of normative or cognitive limits that guarantee the identity and uniqueness of the ecosystem. It is worth mentioning that the narratives were relevant in the definition of institutional work practices and their impact on collaboration in the field.

At the end of the individual analysis of the Sophia Antipolis case, it was possible to observe the linking of theoretical and conceptual axes from the level of definition of the concepts. Figure 07 illustrates this binding.

Figure 7 - Categorial analysis of the case Sophia Antipolis
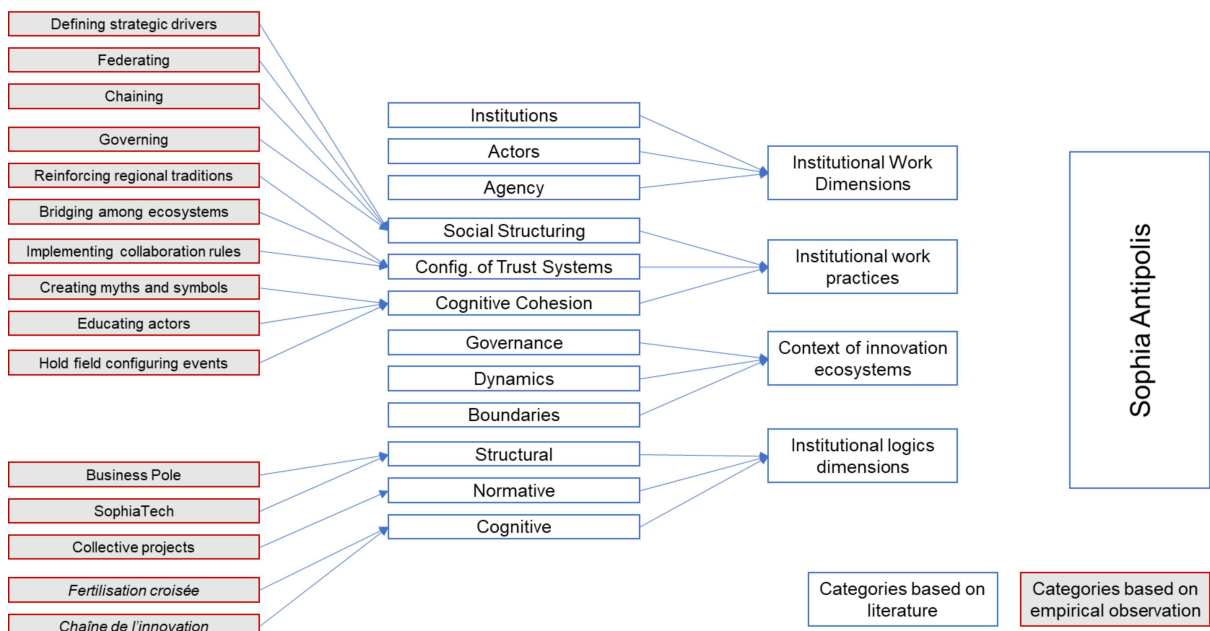
Source: elaborated by the author.

The narratives of the Sophia Antipolis case allowed the identification of concepts (first-order categories) of institutional work practices and dimensions of institutional logics. Ten categories linked to social structuring, the configuration of trust systems, and cognitive cohesion support evidence from institutional work practices. Also, five categories comprise evidence from dimensions of institutional logics.

In the individual analysis of the Tecnosinos case, eleven narratives stood out. Here again, the objective of the individual analysis was to identify the practices that led

to sustaining an institutional environment capable of fostering collaboration. These narratives include the construction and use of integration structures and cognitive and cultural patterns that guarantee the identity and uniqueness of the ecosystem, but also the effort on the connection between the ends of supply and demand for technological development.

The individual analysis of the Tecnosinos case produced seventeen categories based on empirical observations. Figure 08 illustrates the enchaining of the categorical analysis of the Tecnosinos case.

Figure 8 - Categorial analysis of the case Tecnosinos
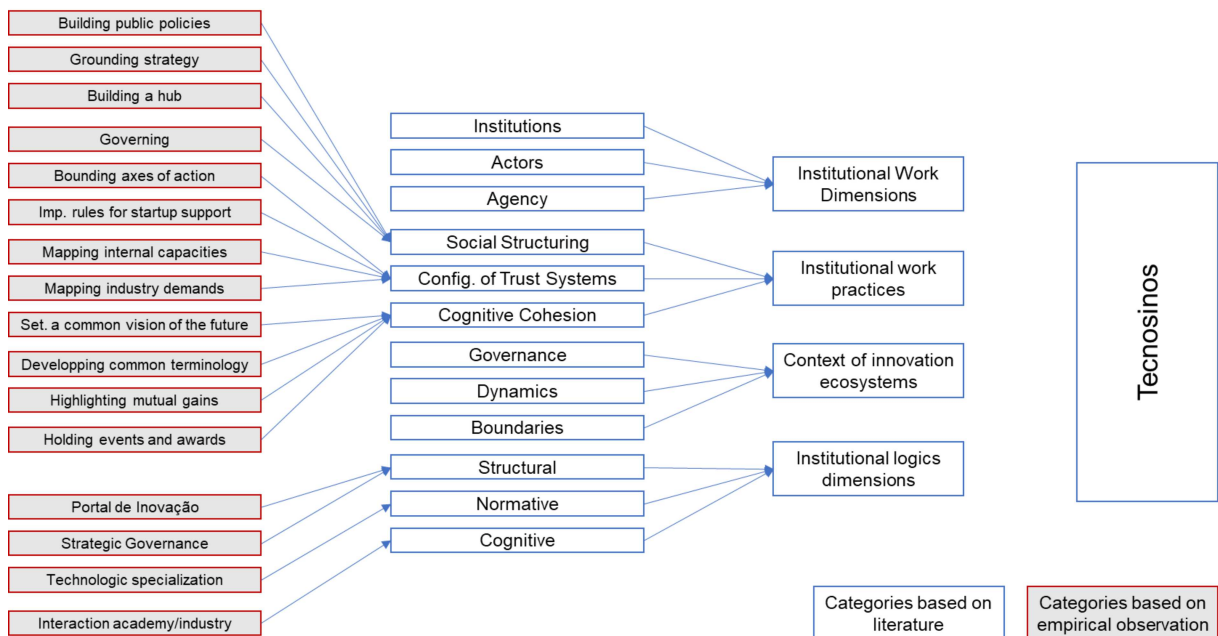
Source: elaborated by the author.

The set of concepts produced from the individual case analysis allowed the construction of a first theoretical-conceptual framework for each of the cases. Differences between cases demonstrate the impact of contextual characteristics on the causal relationships between institutional work practices and institutional logics for fostering collaboration inside innovation ecosystems. At the end of the individual analysis stage, the dissertation pointed out ten practices of institutional work potentially influencing the institutionalization of collaboration in the Sophia Antipolis ecosystem and twelve practices that are characteristically similar in the Tecnosinos case.

4.3 Comparative case analysis

In the third methodological stage, a comparative analysis between the cases was carried out. The objective of this stage was to find disparities related to the institutional context of innovation ecosystems and similarities in the dynamics of fostering collaboration within the ecosystem.

Innovation ecosystems flourish as economic development strategies in different regions of the world (Adner & Kapoor, 2010; Hwang & Horowitt, 2012). The institutional distance between different regions highlights the need to consider the cultural, normative, and cognitive context (Hotho & Pedersen, 2012) in institutional studies. For this reason, this dissertation set out to produce a contextualized explanation under the critical realism ontology (Welch et al., 2011). The comparison between cases is, therefore, opportune.

Content analysis at this stage split out into two steps. The first aimed at mapping similarities and contextual disparities. The unfolding of the theoretical-conceptual axes of institutional work dimensions and innovation ecosystem contexts – presented in table 07 – served as the basis for the analysis. The institutional distance between the cases was evident – *i.e.,* the complexity of governance structures, government participation, institutional maturity, university position, and level of technological development. The results of this analysis set at the beginning of the respective case presentation sections – *i.e.*, 6.1 Sophia Antipolis and 6.2 Tecnosinos.

The second step of comparative case analysis sought similarities between the dynamics of interaction between institutional work practices and dimensions of institutional logics. As a result, a new categorical axis emerges from empirical observations – *i.e.,* relational assets of institutional work. Figure 09 positions this new axis on the categorical analysis canvas.

Figure 9 - Categorial analysis of both cases comparatively
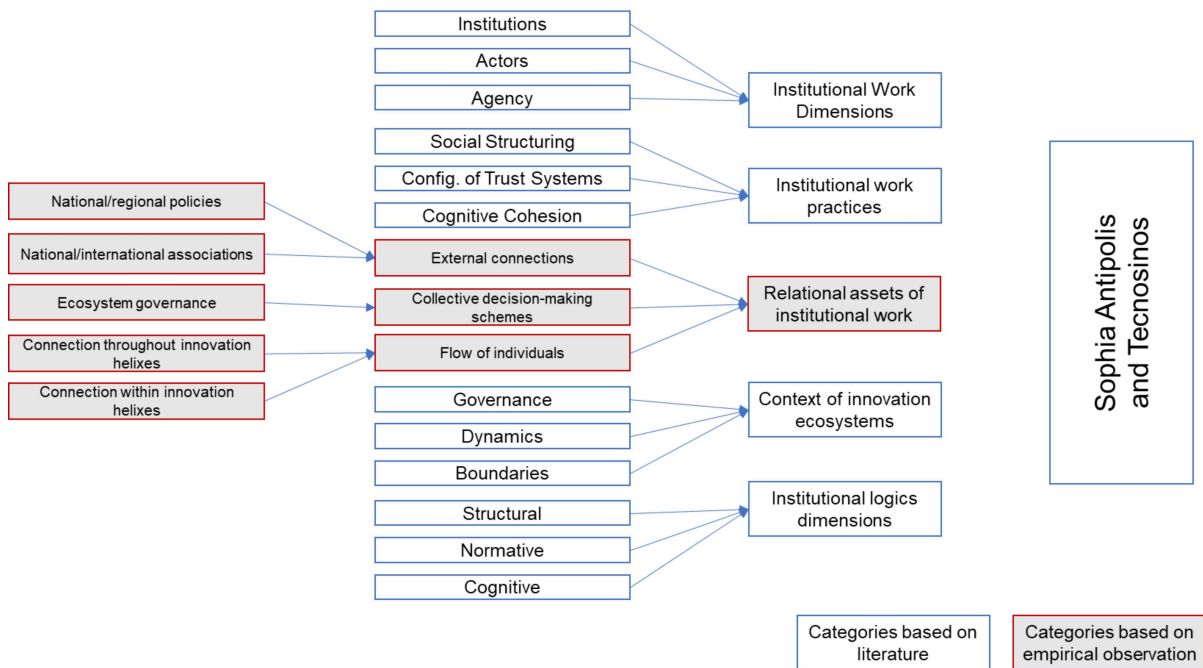
Source: elaborated by the author.

The narratives of both cases highlight the use of relational elements as a way to facilitate the implementation of institutional work practices and enhance the impact on dimensions of institutional logic. These elements, then, were proposed as assets as they are linked, albeit indirectly, and shared in the innovation ecosystem. The narratives show three relational assets – *i.e., external connections, collective decision-making schemes; the flow of individuals through organizational structures*. Examples of assets are national/regional policies, international/national associations, ecosystem governance, connection throughout innovation helixes, and connection within innovation helixes.

The categorical analysis framework is an outcome of abductive inferences conducted in this study. The research recognizes theoretical-conceptual axes mapped by the literature; however, it seeks to reflect these constructs on empirical observations. The result is a set of evidence that supports twenty-one institutional work practices and three relational assets that facilitate the implementation of these same practices and enhance their results on institutional logics.

4.4 Synthetic outcomes and conclusions

Narratives can elucidate the individual's engagement with the institutional work practices implemented in the field (McGivern, 2015). Thus, the results are presented based on the narratives brought by respondents to semi-structured interviews. The narratives are presented and connected throughout the text in order to allow the reader to understand not only which practices and which actors highlight, but how these institutional work practices are conducted and how they impact the dynamics of collaboration in ecosystems. Secondary data, as well as notes produced from non-participant observation, are brought in due time to validate narratives.

The cases are presented individually in order to demonstrate the dynamics of carrying out institutional work practices from different institutional contexts. The beginning of each section is reserved for describing the institutional context of the innovation ecosystems. Then, the practices are presented according to their impact on social structuring, the configuration of trust systems, and cognitive cohesion.

The result of the individual case analysis is a theoretical-conceptual framework that classifies institutional work practices based on their impact on dimensions of institutional logic. These frameworks highlight the role of the institutional context on the engagement and direction of practices. For this reason, a framework is produced for each case separately.

After presenting the cases individually, the later section reveals the comparative analysis of the cases. Relational assets gain emphasis in this section. Again, narratives supported the description of relational assets as enablers in the interaction between institutional work practices and institutional logics.

Due to the innovative character concerning the current literature, propositions are made about the role of each relational asset in the interaction between institutional work practices and institutional logics. Finally, a theoretical-conceptual framework capable of theorizing the empirical evidence of both cases is proposed. The final theoretical-conceptual framework demonstrates how institutional work practices, based on relational assets, foster collaboration in innovation ecosystems, achieving the general objective of this dissertation.

5 RESULTS

This chapter portrays the results of the dissertation based on the theoretical and conceptual precepts that shed light on the empirical analysis, in addition to the methodological procedures adopted. The chapter splits twofold to present the results obtained from the individual analysis of the cases. For each case, empirical evidence is brought to contextualize the innovation ecosystems, to characterize the institutionalized collaborative behavior, and also to depict the institutional work practices typified according to the framework emerging from the literature analysis: social structuring, the configuration of trust systems and cognitive coherence.

5.1 Sophia Antipolis

Sophia Antipolis is an innovation ecosystem located in the Provance-Alpes Côte d'Azur region, in the south of the French territory. Its development history, governance structure, industry expertise, and stakeholder interaction make this a representative case of the innovation ecosystem.

Sophia Antipolis arises from a public policy of regional economic matrix conversion. Until the 1960s, "the Côte d'Azur region had its economic matrix based on tourism, culture and retirement" (Interviewee – SA12). In 1969, as a policy headed by Senator Pierre Laffitte, it was launched the idea of developing a "*cartier latin aux champs*" (Interviewee – SA08), that is, space where science could develop rapidly outside urban centers (El Idrissi & Hauch, 2003).

Although near the city of Nice, Sophia Antipolis comprises an area of approximately 2,400 hectares between the sea and the mountain, until then uninhabited in its entirety. Based on a "low environmental impact urban project, where, on the horizon, buildings should not exceed the height of the nearest mountain" (Interviewee – SA16), Sophia Antipolis has, throughout its history, sought to harmonize human occupation with the natural landscape of the region. Figure 10 comprises photographs recorded at the time of field data collection and portrays the result of the urban project implemented in the ecosystem.

Figure 10 - Landscape of Sophia Antipolis

Source: elaborated by the author.

Although officially launched as an environment for innovation in 1971, Sophia Antipolis experienced significant territorial development from the decade of the 1980s on, with the establishment of public research centers and universities – *i.e.,* INRA, INRIA, EURECOM, CNRS, Université Nice Sophia Antipolis, Université Cote d'Azur. This fact is characteristic of the case since the first actors to settle in the region were not research and innovation structures, but large private companies such as IBM and Texas Instruments that sought to set up their R&D departments in regions with high-quality life index.

Sophia Antipolis currently has outstanding figures as economic activity in the region. According to official sources, approximately 2,200 companies are located in the innovation ecosystem, employing 36,000 workers (Fondation Sophia Antipolis, 2019). Besides, education and research structures hold 4,500 researchers and 5,500 students (Fondation Sophia Antipolis, 2019). Figure 11 seeks to synthesize the plurality of actors that make up the innovation ecosystem, with some examples of private and public organizations. The actors spread across three major innovation

networks: research and education, entrepreneurial, and institutional. At the heart of the ecosystem is the governance committee of the Syndicat Mixte Sophia Antipolis – SYMISA. This governance body has decision-making power on infrastructure and ecosystem maintenance issues, as well as political lobbying to raise public fund investment in the region.

Figure 11 - Innovation Ecosystem Actors in Sophia Antipolis
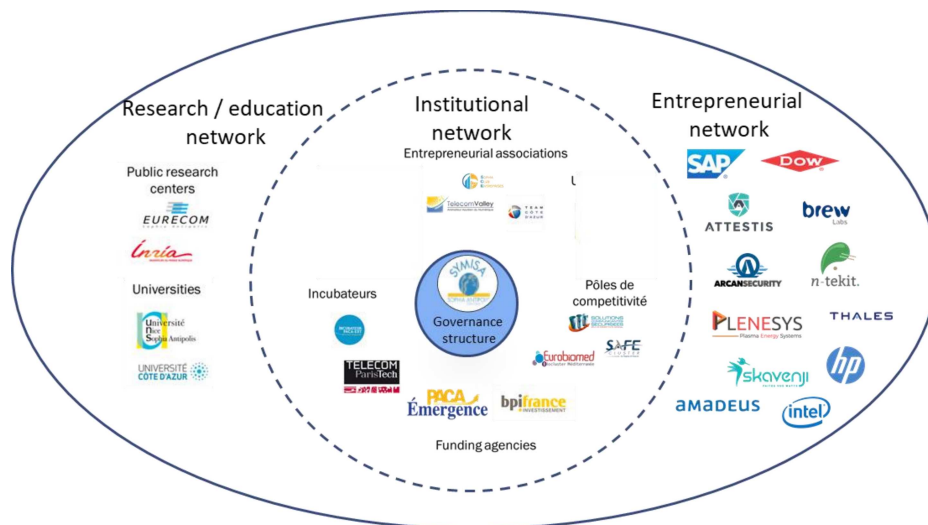
Source: elaborated by the author.

These actors, through recurrent and purposeful collaboration (Song, 2016), are responsible for the outcomes of technological development in the environment. Throughout the data collection, evidence portrayed the institutionalization of collaboration in the field.

5.1.1 Collaboration in Sophia Antipolis

The initial project of Sophia Antipolis grounded on the concept of *fertilisation croisée* as a way to foster an environment of recurrent and initially informal interaction between actors in the innovation ecosystem (El Idrissi & Hauch, 2003). The combination of informality and recurrence of interactions may lead to unexpected discoveries (Carayannis, 2008). Based on this attempt, Sophia Antipolis raised in 1969 (Rasse, 2008). Today, the term *fertilisation croisée* is still recurrent in the key actors' discourse as a way of "getting big companies, startups and universities to work together on common issues" (Interviewee – SA14).

The culture of cross-fertilization is institutionalized in the field. As a representative of the governance body stands: "the *technopole* needs to be grounded on the *fertilisation croisée*, on sharing, and institutional connections to companies" (Interviewee – SA16). Moreover, in the actual presentation to external actors, the term is used to explain the meaning of the innovation ecosystem. Team Côte d'Azur, responsible for promoting the innovation ecosystem in France and abroad, uses the term *fertilisation croisée* in its promotional materials.

Cross-fertilization reflects the formation of interorganizational networks in the field. Formal and informal networks run through governance structures, such as the SYMISA committee, where "all major institutional actors in the field have a bearing on *technopole* decisions" (Interviewee – SA14) and reach collaborative practices in the collective projects supported by the *pôles de competitivité*. A representative of the governance body stands that: "basically, because of their constitution format, the networks actually support Sophia Antipolis" (Interviewee – SA08).

Under the perspective of collaboration between companies, the collective projects supported by the *pôles de competitivité* gain prominence. Although shaped according to a national public policy, the *pôles de competitivité*, as public organizations, connect national and international funding to collective technological development projects. These projects, however, must adhere to guidelines, as they "must necessarily involve a large company, a small company, and a research center" (Interviewee – SA02). The two *pôles de competiitivité* operating in the Sophia Antipolis ecosystem currently have "approximately 300 members, of which 70% are SMEs" (Interviewee – SA01). Collaborative programs, such as the collective projects, ensure that "technology transfer from academia to industry is relatively strong in Sophia Antipolis, comparing to other regions in France" (Interviewee – SA10).

In addition to research centers, universities also support programs that seek technological development. The Pépite PACA Est program is a partnership between the Université Côte d'Azur and the Incubateur PACA Est that seeks to bring innovative ideas that emerge from research at the university level to entrepreneurship support structures.

Social structures (Song, 2016), rule systems ensure trust, and cognitive coherence (Hwang & Horowitt, 2012) underpin the collaborative initiatives in the field. The following sections stress the pillars of collaboration in innovation ecosystems.

5.1.2 Social Structuring in Sophia Antipolis

Cooperation inside innovation ecosystems ground on a tripod of enabling elements, *per se* connection structures, rules and norms for exchange, and mutual understanding (Hwang & Horowitt, 2012). The enabling elements of collaboration might fit into three essential characteristics of the organizational field. The definition of connectors, in addition to diversity, responds to the social structure characteristic of the organizational field. The elements of rules definition and trust enablement are directly related to the feature of the rules system of the organizational field. Finally, motivations and the interpretation of rules integrate the characteristic of understandings of the organizational field.

For instance, platforms as connection structures capable of connecting individuals, organizations, or projects (Autio & Thomas, 2014; Adner & Kapoor, 2010) depend on the development of formal social structures that might guarantee the association of diverse actors. Also, the formation of a heterogeneous group in cultural and technological profiles ends up defining the diversity of entrepreneurs that will lead and respond to the effectiveness of the ecosystem (Song, 2016). Heterogeneity in innovation ecosystems is essential for the dynamics of the environment since homogeneous groups tend to restrict the space for the complementarity of resources (Pfeffer & Salancik, 2003), discouraging the interaction between actors.

Sophia Antipolis presents structures capable of receiving and connecting new business ideas, aiming to generate innovation through the collaboration process. Sophia Antipolis, as a platform-structured ecosystem, is organized through two centers: le *Business Pôle Sophia Antipolis* and *SophiaTech*. These centers are connecting infrastructures responsible, on the one hand, for physically connecting start-ups and large companies, and on the other, public research and development assets and private companies.

The *Business Pôle* hosts all main support agents for entrepreneurship development in the park. The *pôles de competitivité* SCS and Eurobiomed, the Telecom ParisTech and PACA-Est incubators, the Agence Régionale d'Innovation et d'Internationalization (ARII), the Communauté d'Agglomeration Sophia Antipolis (CASA), the Com4Innova platform, in addition to the Côte d'Azur Chamber of Commerce and Industry (CCI) and the Telecom Valley trade association have all offices inside the *Business Pôle*. In terms of structures for entrepreneurship, "the

existence of public service desks for all these entities facilitates and speeds up the processes of creating new ventures (Interviewee – SA04)".

The *Business Pôle* is a complex of offices and administrative infrastructure to enhance the startup supporting process. Its structure brings together the incubators, a *pepinère d'entreprise,* and accelerators. As a director of an incubator sustains: "the incubator is responsible for the first step in hosting the innovative idea that might come from researchers and entrepreneurs from public universities and research centers or the private market." (Interviewee – SA09). Once the idea had become a formal company, it might be host by the *pepinière d'entreprise*, "with the primary function of welcoming entrepreneurs through a collaborative process" (Interviewee – SA14). The *pepinière d'entreprise* is particular to the French supporting process for startup development; it sets between the incubator and the accelerator. This way, the "*pepinière d'entreprise* plays the role of fostering access to market to new ventures" (Interviewee – SA11). Once the startup had matured its connections to the market, it may receive investment from venture capitalists. Connecting entrepreneurs to venture capitalists is the role of incubators. The representative of an accelerator says the: "in Sophia, there are acceleration structures that deal with the process of connecting start-ups to venture capital, such as Village by CA. The Crédit Agricole network makes the connection between entrepreneurs and investors" (Interviewee – SA06).

The startup supporting chain in Sophia is a clear practice of connecting actors with different social positions (Empson, Cleaver & Allen, 2013). By doing so, the actors replace the sets of social connections and promote social mobility to entrepreneurs (Waldron et al., 2015).

While the Business Pôle represents Sophia Antipolis's entrepreneurship center, Sophia Tech represents its academic and research center. Inaugurated in 2012, Sophia Tech is a campus dedicated to the training and development of Information and Communication Technologies. Its structure is the outcome of a partnership between universities and research laboratories: Polytech Nice Sophia, Eurocom, Telecom ParisTech, INRIA, CNRS, INRA. According to official data (Fondation Sophia Antipolis, 2019), Sophia Tech hosts 3,000 students and 800 professors/researchers.

The coexistence of several organizational actors with the power to influence the territory development headed to the creation of structures of governance. These structures, in particular, the Syndicat Mixte de Sophia Antipolis - SYMISA, seek

convergence of objectives in the diversity of existing actors in Sophia Antipolis, with a direct impact on the social structure of the ecosystem.

5.1.2.1 Governance in the ecosystem of Sophia Antipolis

Since its foundation as a research and development space in 1969, Sophia Antipolis has been experiencing different governance structures. A representative of the governance body reckons that: "as new organizations and new sectors of the economy settle in Sophia, the greater the need for governance structures" (Interviewee – SA08). Besides the fact of bringing together different sectors of the economy, the territorial layout of the technology park enhances complexity. There are five cities – communes – that house Sophia Antipolis as part of their territory, *per se* Antibes, Biot, Mougins, Valbonne, and Vallauri.

The main governance structure of Sophia Antipolis nowadays is the Syndicat Mixte de Sophia Antipolis – SYMISA. A representative of the governance body recalls the "French law enables the formation of this legal personality to address issues of shared territorial ownership" (Interviewee – SA16). Of the five cities to which the territory of Sophia Antipolis spreads, Antibes, Biot, Valbonne, and Vallauri are part of Communauté d'Agglomeration Sophia Antipolis, while Mougins is part of the Communauté d'Agglomération Cannes Pays de Lérins. Thus, under the French law (Article L5216-1 of the General Code of Territorial Activities), questions of intercommunity cooperation relating to the territory of the Sophia Antipolis Technology Park cannot be dealt with in a single *communauté d'agglomeration*. In response to this challenge, SYMISA has gained strength as the park's primary governance entity since 1999 (Grondeau, 2006). This feature is typically French in one respondent's view: "It is very complex, and, like all French institutions, instead of shutting down something, they create something else that's adding to all the complexity, it is always like this." (Interviewee – SA10).

SYMISA currently comprises representatives of "Communauté d'Agglomération Sophia Antipolis, the department of the Alpes Maritimes, the Nice Côte d'Azur Chamber of Commerce and Industry, the Provence Alpes Côte d'Azur region and the city of Mougins" (Interviewee – SA16). A representative of a development agency stands that: "at this table, all decisions that will impact Sophia Antipolis are made" (Interviewee – SA14). The SYMISA meets monthly to "address infrastructure issues

such as highways, lighting, mail, etc. and all administrative matters" (Interviewee – SA08).

The diversity of actors at the table for decision making in Sophia Antipolis has an ambivalent character. On the one hand, it is positive as it "centralizes and gives a tone of validity to all decisions taken within the *Syndicat*" (Interviewee – SA16). On the other hand, "decisions are time-consuming when there are this many voting actors" (Interviewee – SA08). Thus, SYMISA is a fertile territory for institutional work practices of advocacy, where there is a constant search for political support for the implementation of individual objectives (Lawrence & Suddaby, 2006).

Governance structures are essential in validating strategic drivers in innovation ecosystems. A representative of the governance body sustains that "every actor in Sophia Antipolis has a vision of the future, however setting parameters for investment should go through SYMISA, and it is important to have this body that will say 'ok let's look together and make a decision'" (Interviewee – SA08). In addition to the institutional advocacy work, this fact observed in Sophia Antipolis's social structure underscores the shared nature of the agency in institutional work (Empson, Cleaver & Allen, 2013). Actors seek already established networks to garner support for their institutionalization efforts, such as the decision by strategic drivers who will define the direction of investment in the innovation ecosystem.

In 2018, a new technology sector gained strength in Sophia Antipolis. The Université Côte d'Azur responded to a call from the French Government to set up large centers specialized in Artificial Intelligence. The project, although initially designed and coordinated by Université Côte d'Azur "was taken to the SYMISA committee for political support. The technical details of the project were not discussed there, but certainly, the committee played an important role in legitimizing the project." (Interviewee – SA13). As a result, Sophia Antipolis launched with significant government funding in 2019 the 3IA Côte d'Azur, an interdisciplinary institute for the development of artificial intelligence technologies for the healthcare and smart territories segments.

The legitimacy of governance structures in an innovation environment recalls three pillars of recognition: 1) form, 2) entity, and 3) space for interactions (Berthinier-Poncet, 2014). In this perspective, SYMISA has an established form, including the leading decision-makers in the ecosystem. It holds recognition as an entity given the group's search to support initiatives to develop new ventures in the ecosystem. In time,

the SYMISA committee is a recurring space for interaction, with periodic meetings to validate ideas and make decisions.

In addition to SYMISA, another body that brings together decision-makers on the direction of the innovation ecosystem is Sophia Club Entreprises. While SYMISA stands as the park's administrative and infrastructure decision-making body, Sophia Club Entreprises directs the organization of informal exchange and knowledge activities among large companies, startups, researchers, and public agents in the ecosystem. A director of a development agency tells that "Sophia Club Entreprises is a leading corporate club for the organization of conferences and events that enable ecosystem exchanges" (Interviewee – SA03).

Sophia Club Entreprises' flagship product is Jeux de Sophia. A representative of the club explains that "this event takes place between May/June; it works like the Olympic Games" (Interviewee – SA20) Informal communication and interaction structures allow serendipity discoveries to take place, as a relevant factor in the innovative oxygenation of ecosystems (Carayannis, 2008). A director of a development agency still reckons that "teams of employees and entrepreneurs of different companies register in several sports. This event is recognized and emblematic in Sophia." (Interviewee – SA03).

Even though governance structures can settle conflicts and direct efforts to achieve strategic gains (Dyer & Singh, 1998), Sophia Antipolis brings together a unique variety of actors with legitimacy to bring about institutional change. Thus, the case presents a latent dispute for central positions in the innovation ecosystem and also in the park's strategic direction.

5.1.2.2 Struggle for leadership

The perspective of leadership in the organizational field is not consensual among interviewees. Under the perspective of platform-structured innovation ecosystems (Autio & Thomas, 2014), Sophia Antipolis presents at least two organizations that seek to connect, or, according to interviewees, to "federate" (Interviewee – SA07) other institutional actors: French Tech Côte d'Azur and Université Côte d'Azur.

Overlapping objectives highlight potential conflicts over the field centrality. One interviewee uses the analogy of a ship with several captains to illustrate what happens

in Sophia Antipolis. A representative of the governance body makes the analogy: "[…] If you have many captains on the boat, where is the boat going? If you have one captain, then the tenants are going to follow his orders, but if you have many captains, maybe one captain is going to come out because he hit one of the captains, but is it the right captain or not?" (Interviewee – SA08). This account makes clear the struggle for leadership in terms of the strategic direction of the field. The actors seek higher centrality of the field in typical institutional work of social mobility (Waldron et al. 2015).

In 2014, the French Government launched the French Tech program, which foresees the installation of centers capable of bringing together key players in the promotion and development of startups, based on the economic matrix of each region. Thus, French Tech Côte d'Azur sets in the region based on technologies for education, entertainment, mobility, security, and privacy. Due to its technological development, Sophia Antipolis also receives an office from French Tech Côte d'Azur.

Since Sophia Antipolis, unlike other regions in France, already has an institutional structure to support and develop innovation, the French Tech Côte d'Azur seeks to use existing structures and organize the service for entrepreneurs in the region. Looking ahead, French Tech Côte d'Azur seeks to "[...] become the one-stop *guichet* for entrepreneurs in innovation in digital technologies seeking development and hyper-growth" (interviewee – SA07). For this, "it is not necessary to create new associations since this would be redundant" (Interviewee – SA07).

French Tech Côte d'Azur's developmental narrative in Sophia Antipolis highlights the institutional work of social mobility (Waldron et al. 2015) and the connection between actors from different positions in the organizational field (Empson, Cleaver & Allen, 2013). Until 2016, the French Tech program was an external actor, with the possibility of only indirect influence, when associate members from other regions sought relationships with companies based in Sophia Antipolis. From 2016, when Télecom Valley demonstrates an "enormous openness to French Tech" (Interviewee – SA07), the institutional actor penetrates the organizational field. From this moment, the French Tech Côte d'Azur seeks to bridge the gap between existing ecosystem associations – *i.e.,* Pôle SCS, Incubateur PACA-Est, Accelerator Village by CA, Pepinière CASA – and potential entrepreneurs and researchers seeking development of new technologies. This movement reinforces the actor's legitimacy at two ends of the organizational field and positions it more centrally.

For collaboration in the ecosystem, platform building is positive as it helps in connecting different stakeholders in technological development (Song, 2016). French Tech Côte d'Azur "allows the entrepreneur who joins the program to access a community that is visible in France and abroad" (Interviewee - SA07).

The university also plays an essential role in building bridges between entrepreneurs and researchers. Some interviewees believe that universities in Sophia Antipolis could play the role of connecting center in this ecosystem. A representative of the governance body reveals that "the university is a research stronghold that has to be open to market needs" (Interviewee – SA08). The university gains importance in "[...] the development of technological disruptions, as the university is a testing, prototyping environment where market demands can be received, and responses can be tested" (Interviewee – SA15).

The narrative of seeking for the centrality of the university in Sophia Antipolis involves strengthening the research and education network. According to a professor: "recently, the University of Nice has become the University of Cote d'Azur, and the University of Cote d'Azur is now gathering all research for education and institutions of the Cote d'Azur together, it is becoming one big, strong and visible university. While before it was all separated, researching different areas, now, it is all the University of Cote d'Azur, and it has given it more visibility." (Interviewee – SA10). Unlike French Tech's centrality-seeking narrative, Université Côte d'Azur sought to reinforce the connection between like-minded actors in the organizational field. The adhesion of local actors makes it possible to build legitimacy from the reinforcement of trusting relationships and the capillarity of institutional work practices (Barin Cruz et al., 2016). By adopting this practice, Université Côte d'Azur can reinforce its presence in the innovation ecosystem and coordinate actions to stimulate collaboration between marketing and research agents, through its different education and research agencies.

Table 12 summarizes the institutional work practices identified in the case of Sophia Antipolis that lead to social structuring capable of supporting collaborative events in technological development. Table 12 exposes four narratives exemplify practices of advocacy (Lawrence & Suddaby, 2006), the connection between actors with different positions in the organizational field (Empson, Cleaver & Allen, 2013) and social mobility (Waldron et al. 2015).

Table 12 - Narratives of institutional work to social structuring in Sophia Antipolis

IW Practice	Narrative	Excerpt
Advocacy	Governance	"At this table [committee of the Syndicat Mixte de Sophia Antipolis], all decisions that will impact Sophia Antipolis are made out" (Interviewee – SA14). "[the committee] centralizes and gives a tone of validity to all decisions taken within the *Syndicat*" (Interviewee – SA16).
	Strategic drivers definition	"Every actor in Sophia Antipolis has a vision of the future, however setting parameters for investment should go through SYMISA, and it is important to have this body that will say 'ok let's look together and make a decision'" (Interviewee – SA08). "[the project for launching an AI center] was taken to the SYMISA committee for political support. The technical details of the project were not discussed there, but certainly, the committee played an important role in legitimizing the project." (Interviewee – SA13).
Connection among actors with distinct positions	Startup supporting chain	"The incubator is responsible for the first step in hosting the innovative idea that might come from researchers and entrepreneurs from public universities and research centers or the private market." (Interviewee – SA09). "[the] *pepinière d'entreprise* plays the role of fostering access to market to new ventures" (Interviewee – SA11). "[…] The Crédit Agricole network makes the connection between entrepreneurs and investors" (Interviewee – SA06).
Social mobility	Federating process	"[the French Tech Côte d'Azur seeks to] become the one-stop *guichet* for entrepreneurs in innovation in digital technologies seeking development and hyper-growth" (interviewee – SA07) "it is not necessary to create new associations since this would be redundant" (interviewee – SA07). "Recently, the University of Nice has become the University of Cote d'Azur, and the University of Cote d'Azur is now gathering all research for education and institutions of the Cote d'Azur together, it is becoming one big, strong and visible university. While before it was all separated, researching different areas, now, it is all the University of Cote d'Azur, and it has given it more visibility." (Interviewee – SA10).

Source: elaborated by the author.

Sophia Antipolis is a representative case in terms of social structures capable of promoting the connection between dispersed actors in the innovation ecosystem. However, it is necessary for the actors installed there to be able to share the same rules of conduct and to rely on the ecosystem's mutual gain relationships so that they are effectively willing to collaborate (Hwang & Horowitt, 2012). The configuration of trust system supports social structures that will ensure the recurrence of exchanges between ecosystem agents (Song, 2016).

5.1.3 Configuration of trust systems in Sophia Antipolis

Three groups of institutional work practices are capable of configuring trust systems in an organizational field: definition; guarantees (Lawrence & Suddaby, 2006); and configuration of limits (Zietsma & Lawrence, 2010). The first group deals with practices related to the foundation of rule systems that will give identity status, the definition of participation, and hierarchy in the field. The practices of guarantee deal with the creation of rules on property rights. Finally, practices of the configuration of limits will define the spaces and rules of conduct and action.

Trust systems in Sophia Antipolis arrange around the definition of technological development drivers. There was no evidence sustaining the set of innovation ecosystem rules guaranteeing specific property rights in the ecosystem, only those already guaranteed by federal law and international agreements. For this reason, the reports presented in this section deal with institutional work practices of defining and configuration of limits (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010).

Sophia Antipolis is an innovation ecosystem based on technological development into two primary markets: digital technologies and biotechnology. Collaborative narratives for both markets follow the same structure. For emerging businesses – startups – the actors responsible for the startup support chain select projects according to the economic sectors installed in the ecosystem. Regarding large companies, the only restriction is that the activities developed in the ecosystem must be services. Thus, "Sophia Antipolis is today a big research and development park" (interviewee – SA04).

The incubation process, as the first step in the startup supporting chain, is responsible for defining which segments of the economy will be acceptable for technological development in Sophia Antipolis. The director of an incubator recalls that: "projects are accepted according to their technological profile. We have companies from various segments of the economy here, but they always use digital technologies or biotechnology as components of their products." (Interviewee – SA09). This delimitation ensures that the companies installed in the ecosystem share the same technologies and may eventually share and collaborate for joint development. By adopting this practice, the actor Incubateur PACA Est is delimiting the organizational field (Ziestma & Lawrence, 2010) and defining which companies will participate in the ecosystem.

Sophia Antipolis was planned in 1969 to house companies that could develop low environmental impact technologies. Thus, "[...] there are no industries in Sophia Antipolis, large industrial companies such as Dow Chemical bring here only their R&D departments. This is a restriction." (Interviewee – SA04). Once again, constraints act as institutional work practices to configure the limits of the organizational field (Ziestma & Lawrence, 2010). It is noteworthy that SYMISA is the body that restricts manufacturing activities inside the ecosystem, as it is responsible for administrative governance.

In terms of rules for collaboration in the ecosystem, the collective projects of the *pôles de competitivité* gain prominence. Products of national public policy, these organizational entities have a strong influence on the technological development path in Sophia Antipolis, especially under collaborative perspectives.

5.1.3.1 Collective projects of the *pôles de competitivités*

Pôles de competitivité, as a national public policy, plays an acknowledgeable role in the development of collaboration inside the ecosystem of Sophia Antipolis. Based on the objective of "supporting collective projects with three forms of funding: local, national and European level" (Interviewee – SA02), the activities of the *pôles de competitivité* merge efforts between research agents, start-ups and large companies. Collective projects can bring together structures and professionals with different profiles around common goals in a clear example of institutional work connecting actors with different positions in the social structure of the organizational field (Waldron et al., 2015).

The *pôle de competitivité* SCS has been set in Sophia Antipolis since 2005 and organizes the distribution of resources and rules of service for its projects according to the region's development strategy. Priorities consider the level of project integration, whether local, national, or European. According to a representative of a development agency, "a specific budget is set for each level, and a center is responsible for selecting and evaluating projects according to its competitiveness" (Interviewee – SA02). Besides, the project approval depends on having "at least three participants: a large group, a public research laboratory, and an SME." (Interviewee – SA03). Thus, the implemented policy, as an ecosystem rules framework (Lawrence & Suddaby, 2006),

supports the integration between dispersed actors in the organizational field (Waldron et al., 2015). Both practices mapped in the institutional work of social structuring.

Collective projects consider pre-established axes as strategic channels for ecosystem development. The director of a development agency stands that: "the participant actors have to propose a collaborative project that is interactive and within the four main development axes, which in Sophia's case are: artificial intelligence, internet of things, microelectronics and security." (Interviewee – SA03). In addition to ensuring collaborative dynamics, when defining the lines of action, the *pôles de competitivité* implement the institutional work practice of definition (Lawrence & Sudabby, 2006). This practice provides for the foundation of rules capable of guaranteeing identity and delimitation of the organizational field.

Collective projects also have a secondary objective of providing access to public and private financing for technological development. A representative of a development agency reckons: "we [*pôle de competitivité*] will work on R&D and innovation through calls for funding from European, national, or regional projects, or even between two countries." (Interviewee – SA01). This practice is also foreseen in the institutional work of connecting actors dispersed in the organizational field (Waldron et al., 2015) and ensures that the financial flow of investment can follow with greater assertiveness in the field.

Another *pôle de competitivité* in Sophia Antipolis is Eurobiomed. According to a representative of a development agency, "unlike the SCS pôle, which is truly based on a technology line, the Eurobiomed pôle is based on a market" (Interviewee – SA01). Eurobiomed is a competitiveness center focused on the development of health solutions, established in Sophia Antipolis since 2006.

A relevant feature of competitiveness hubs is their ability to connect geographically dispersed innovative environments. As an example, the Eurobiomed hub operates both in the Provence, Alpes, Cotê d'Azur, and Occitaine regions. A representative of a development agency reckons: "there are currently three offices in Marseille, Montpellier, and Sophia Antipolis and we maintain the same rules for supporting collective projects no matter what office the entrepreneur applies" (Interviewee – SA01). Although Ziestma & Lawrence (2010) has demonstrated the strength of external actors in the institutionalization process, the way through which the *pôles de competitivité* operate demonstrates a new form of institutional work,

capable of not only connecting local and external actors to the field but generate synergy between distinct organizational fields.

Table 13 summarizes the institutional work practices of configuring trust system in Sophia Antipolis. Although the case does not evince practices of guarantees, the bridge-building narrative between Sophia Antipolis and other innovation ecosystems in France and abroad draws attention to an institutional work practice not previously identified in the literature. In seeking to build this bridge, the *pôles de competitivité* standardize rules of collaboration between distinct organizational fields.

Table 13 - Narratives of institutional work to configuring trust systems in Sophia Antipolis

IW Practice	Narrative	Excerpt
Definition	Implementing collaboration rules	"[the project] must have at least three participants: a large group, a public research laboratory, and an SME" (Interviewee – SA03). "The participant actors have to propose a collaborative project that is interactive and within the four main development axes, which in Sophia's case are: artificial intelligence, internet of things, microelectronics and security." (Interviewee – SA03).
Configuration of limits	Reinforcing regional traditions	"Projects are accepted according to their technological profile. We have companies from various segments of the economy here, but they always use digital technologies or biotechnology as components of their products." (Interviewee – SA09). "[...] there are no industries in Sophia Antipolis, large industrial companies such as Dow Chemical bring here only their R&D departments. This is a restriction." (Interviewee – SA04).
Standardization between organizational fields	Bridge-building among distinct ecosystems	"We [pôle de competitivité] will work on R&D and innovation through calls for funding from European, national, or regional projects, or even between two countries." (Interviewee – SA01). "There are currently three offices in Marseille, Montpellier, and Sophia Antipolis, and we maintain the same rules for supporting collective projects no matter what office the entrepreneur applies." (Interviewee – SA01).

Source: elaborated by the author.

Cognitive coherence is the third element that may foster collaboration in innovation ecosystems. While connection frameworks may define the boundaries of collaboration (Adner & Kapoor, 2010), and ecosystem rules can ensure trust-building (Hwang & Horowitt, 2012), individuals must share common understandings to ensure continuity of interactional processes (Schwartz & Bar-El, 2015).

5.1.4 Cognitive coherence in Sophia Antipolis

At least four institutional work practices potentially influence the construction of cognitive coherence. The practice of reconfiguring belief systems ultimately reshapes the moral and cultural foundations of individual actions envisaged in the field (Lawrence & Suddaby, 2006). Under constructing sense-making schemes, institutional work stimulates the convergence between cultural and cognitive patterns in the field (Topal, 2015). A third practice is the development and specification of abstractions and the elaboration of cause and effect schemes (Lawrence & Suddaby, 2006). Finally, the practice of education leads actors to develop the skills and knowledge necessary to support the new institution (Lawrence & Suddaby, 2006).

The case of Sophia Antipolis presents two highlighted narratives under the perspective of cognitive coherence. Two terms are exhaustively repeated both during the interviews and in the empirical literature on the innovation ecosystem: *fertilisation croisée and chaîne de l'innovation*. Both terms translate the individual willingness in the field to promote interaction and collaboration between actors.

The term *fertilisation croisée* is at the heart of the constitution of Sophia Antipolis in the year 1969. The initial understanding that the creation, innovation, and development of high-tech product lines requires not only proximity between educational, research, investment agents, but also an environment conducive to informal sociability (Rasse, 2008) remains up to the present day, according to the interviewees' narrative. A director of a development agency sustains: "*fertilisation croisée* is about getting companies, big groups, start-ups and universities working on common topics and getting the best out of it" (Interviewee – SA11).
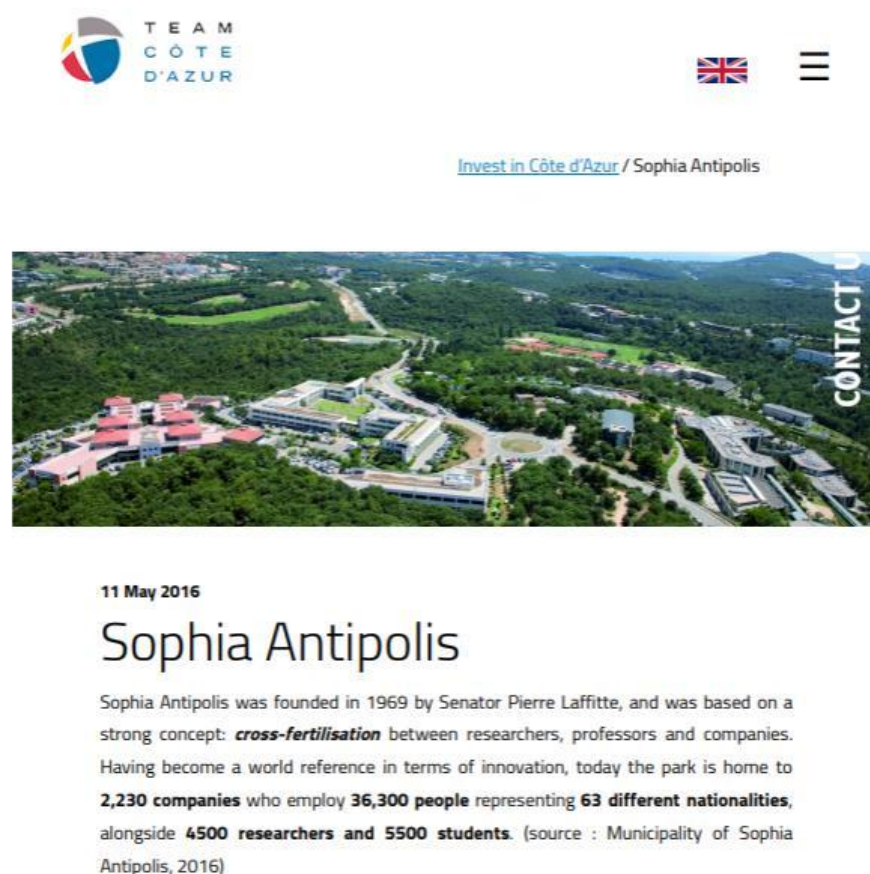
Several actors work to reinforce the spirit of cross-fertilization in the territory of Sophia Antipolis. The *pôles de competitivité*, while bringing within the schemes of cooperation represented by the collective projects of national politics, reinforce the chorus for cross-fertilization, as it is their responsibility "[...] to make it emerge, having all competencies into one place – whether industrial, academic and educational – so that the cross-fertilization can be effectively carried out" (Interviewee – SA02). This process recognizes "the idea of profusion and complementarity that is sought to develop in Sophia" (Interviewee – SA01).

The role of the *pôles de competitivité* in enhancing cross-fertilization in Sophia Antipolis refers to the institutional work practice of education (Lawrence & Suddaby,

2006). Actors seek to develop skills and knowledge to support the new institution. In this case, cross-fertilization reinforces collaboration in the environment.

Another relevant actor in the education of the concept of cross-fertilization is Team Côte d'Azur. A director of a development agency brings that: "the main objective of this organization is to attract investments to the Côte d'Azur region and, of course, to Sophia Antipolis" (Interviewee – SA05). Another representative of other development agency complement: "companies that settle in here, when quickly getting to know the park, are introduced to the concept of *fertilisation croisée* and its impact on the development of technological innovation" (Interviewee – SA17). Figure 12 shows an excerpt from the organization's website, which presents Sophia Antipolis based on cross-fertilization to potential international investors. Once again, the institutional work of education highlights, where new concepts that reinforce the institution are presented not only to actors in the field itself but also to external actors.

Figure 12 - Text Presenting Sophia Antipolis to Foreign Investors

Source: http://www.investincotedazur.com/en/sophia-antipolis/

The reproduction of concepts in ecosystem structures is another evidence of institutional work for enhancing cross-fertilization. According to a representative of a development agency, "the ecosystem governance was created to have everyone around the table, all representatives of each territory in the spirit of *fertilisation croisée*" (Interviewee – SA14). Besides, the physical layout of the territory, blending office, and lab buildings with informal living spaces allows cross-fertilization to occur (El Idrissi & Hauch, 2003). This reproduction of concepts in concrete symbols is related to the institutional work of defining sense-making schemes (Topal, 2015). The main objective of this practice is to build schemes of cognitive and cultural convergence between actors, and the proposed structure seeks precisely that.

Finally, the recurrence of quotations of the term *fertilisation croisée* is illustrative. Of the 20 actors interviewed, 14 cited it to characterize Sophia Antipolis's innovation ecosystem culture. Symbolism remains entrenched, even after 50 years of the founding of the technology park, as an example of institutionalizing collaboration in the ecosystem (Mazza & Pederson, 2004).

Another narrative that highlights the institutional work to build cognitive coherence is the application of the *chaîne de l'innovation*. This concept represents the linkage of institutional actors in the promotion and accompaniment of entrepreneurship in the park. A director of a development agency recognizes that: "the objective is to cover the entire development phase of the entrepreneur, that is, the *chaîne de l'innovation* that integrates: *Incubateur, Pepinière,* and *Accélérateur*" (Interviewee – SA11).

The innovation chain is mainly represented by the incubator, the *pepinière,* and the accelerator, since "innovation projects are generally linked and accompanied by one of these structures" (Interviewee – SA09). However, several actors transit around the chain. The Chambre de Commerce et d'Industrie - CCI - Nice Côte d'Azur sees that its acting is "throughout the innovation chain" being present "from the beginning to the end of a company's life" (Interviewee – SA05). Also, business associations participate in supporting the entrepreneur linked to the innovation chain. According to the director of a development agency, "Télecom Valley is an association that holds training events, workshops on advanced and technical subjects that will strengthen the innovation chain" (Interviewee – SA05).

The narrative of the *chaîne de l'innovation* brings together practices of the institutional work of configuration of belief systems (Lawrence & Suddaby, 2006). The

binding of activities is typical of the constitution of cognitive systems, where actors know precisely what to expect at each stage of the process. Within cognitive systems, cultural and moral patterns take on importance. Thus, "all [actors] can work together, with each in his or her *métier* and type of entrepreneurial support" (Interviewee – SA05). Belief systems are built and reinforced by institutional work (Lawrence & Suddaby, 2006).

Henceforth, actors use narrative propagation tools such as field configuration events (Hardy & Maguire, 2010) to implement the practice of theorizing (Lawrence & Suddaby, 2006). Since cognitive systems define the binding of activities, the practice of theorizing creates abstractions as concepts – *per se* the *chaîne de l'innovation* – to reinforce institutional standards (Lawrence & Suddaby, 2006). Events such as those held by Télecom Valley and spread throughout the territory are tools where actors seek to theorize – *per se* create abstractions – for the way of acting inside the field (Hardy & Maguire, 2010).

Table 14 summarizes the institutional work practices to enhance cognitive coherence inside Sophia Antipolis. All four institutional work practices suggested by literature find a parallel in the filed with the two narratives of *fertilisation croisée* and *chaîne de l'innovation*.

Table 14 - Narratives of institutional work to cognitive coherence in Sophia Antipolis

IW Practice	Narrative	Excerpt
Definition of sense-making schemes	*Fertilisation croisée*	"Ecosystem governance was created to have everyone around the table, all representatives of each territory in the spirit of *fertilisation croisée*" (Interviewee – SA14).
Education		"Companies that settle in here, when quickly getting to know the park, are introduced to the concept of *fertilisation croisée* and its impact on the development of technological innovation." (Interviewee – SA17).
Configuration of belief systems	*Chaîne de l'Innovation*	"all [actors] can work together, with each one in their *métiers* and their kind of entrepreneurial support" (Interviewee – SA05).
Theorization		"Télecom Valley is an association that holds training events, workshops on advanced subjects, and technicians that will strengthen the innovation chain." (Interviewee – SA05).

Source: elaborated by the author.

The empirical observations of Sophia Antipolis allow positioning institutional work practices and their impact on enabling elements for collaboration. The theoretical-conceptual framework seeks to compile these observations graphically.

5.1.5 Theoretical-conceptual framework

Narratives from the case Sophia Antipolis elucidate the set of institutional work practices that might foster collaboration in the innovation ecosystem. Figure 13 portrays these practices and their impact on the three dimensions of institutional logics to enable collaboration in the ecosystem.

Figure 13 - Theoretical-conceptual framework Sophia Antipolis
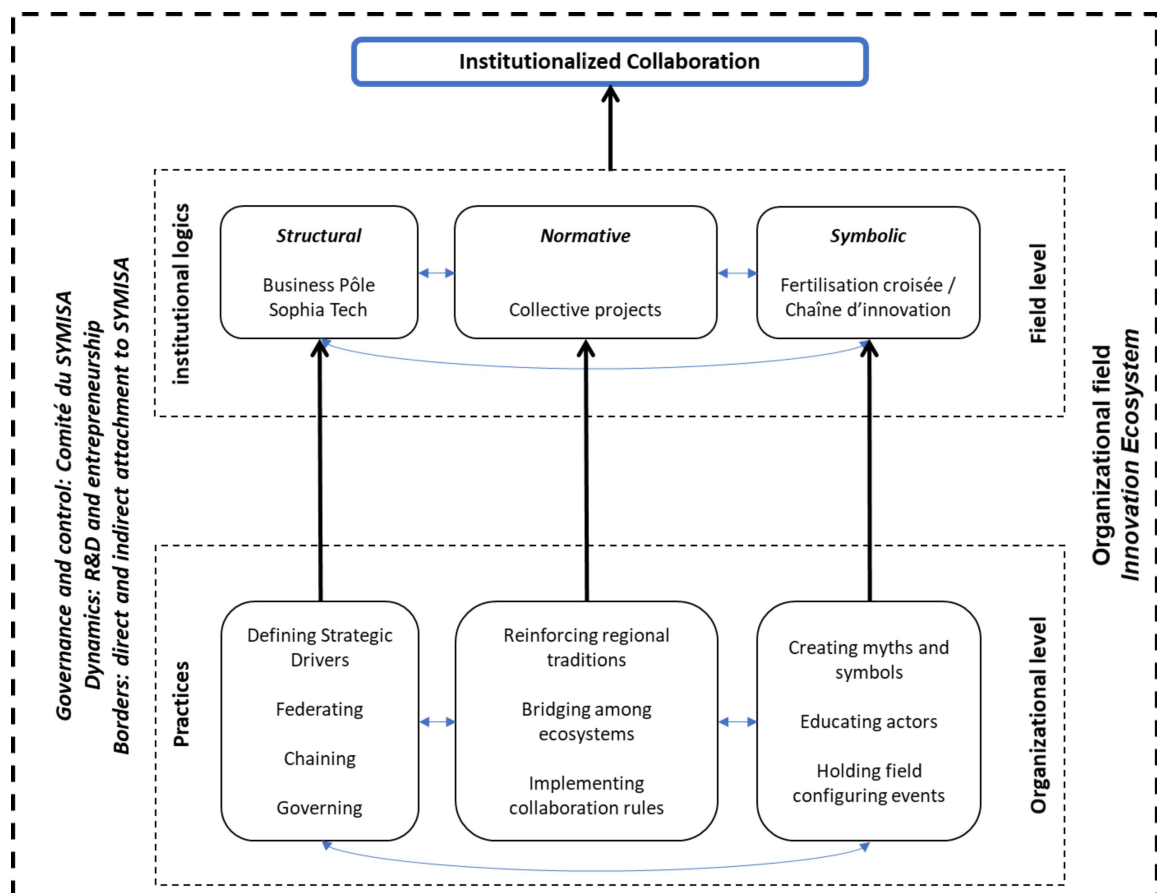
Source: elaborated by the author based on empirical observations and Lawrence and Suddaby, 2006; Empson, Cleaver and Allen, 2013; Thronton and Ocasio, 2008; Thomas & Autio, 2014.

Collaboration, as an institutionalized behavior in Sophia Antipolis is set within an organizational field reflecting structures for governance and control, dynamics for

technological development and environmental borders (Mazza & Pedersen, 2004; Thomas & Autio, 2014). The governance of the ecosystem stands as the *comité* du SYMISA, capable of embracing representatives from public entities, development agencies, industry and academia. Technological development relies on the proximity between R&D departments of corporations and research institutes, and, more recently on entrepreneurship. As a metaphor of the innovation ecosystem as a platform (Autio & Thomas, 2014), the *comité* du SYMISA also defines the borders of the ecosystem since it is acknowledgeable the organizational actors directly or indirectly – *i.e.* represented by associations – attached to the governance body.

Practices befall at the organizational level and reflect in the construction and maintenance of logics, such as models of action and cognition at the institutional level (Willmott, 2011). The first set of practices brings social structuring as the primary objective. These practices reflect political and regulatory mobilization (Lawrence & Suddaby, 2006), as well as the connection among actors with distinct positions in the organizational field (Empson, Cleaver & Allen, 2013) and social mobility (Waldron et al., 2015).

These theoretical reflections allow to empirically identify four social structuring practices conducted by institutional network actors in Sophia Antipolis's innovation ecosystem. *Defining strategic drivers* brings the work of social persuasion conducted by internal actors to the organizational field in order to take the drivers of technological development forward, *i.e.,* Artificial Intelligence in Sophia Antipolis. *Federating,* as a practice of institutional work, seeks to bring together actors from different positions in the organizational field around common goals - *i.e.,* device French Tech Côte d'Azur. *Chaining* is the practice of connecting among initially dispersed actors responsible for specific stages of the same process - *i.e.,* construction of the *chaîne de l'innovation* at Sophia Antipolis. Finally, the practice of *governing* reflects the construction of schemes for collegiate decision making - *i.e.,* comité du SYMISA.

The second set of practices seeks to build trust systems. The literature brings the foundation of rule systems that may confer identity and status (Lawrence & Suddaby, 2006) as well as the definition of boundaries and hierarchies in the field (Zietsma & Lawrence, 2010). The empirical case presents three practices with the power to configure trust systems. *Reinforcing regional traditions* is a practice for implementing strategic drivers. Once defined – *e.g.,* prioritization of businesses related to the development of technologies for artificial intelligence – a new set of rules must

be proposed to effectively implement the strategic driver – *e.g.,* regulations for access to public funds. *Bridging among ecosystems* is a practice of connecting with actors outside the field, where relationship schemes are brought in from other innovation ecosystems - *e.g.,* enforcing rules for collaborative projects of the *pôles de competitivité. Implementing collaboration rules* is the practice driven to demarcate rules that will ensure interaction among actors within the ecosystem - *e.g.,* rules of the collaborative projects of the *pôles de competitivité.*

The third set of practices seeks to build cognitive cohesion in the organizational field. These practices reflect the construction of shared moral and cultural patterns in the field (Topal, 2015) through the creation of myths and symbols, theorizing, and education of actors (Lawrence & Suddaby, 2006). *Creating myths and symbols* appears in the Sophia Antipolis case in the construction of discourses that reinforce the history of the ecosystem development – *e.g.,* discourses on *fertilisation croisée. Educating actors* is the practice of informing and disseminating knowledge about coexistence rules and ecosystem structures – *e.g.,* Team Côte d'Azur's investor reception work. *Holding field configuring events* is the practice of organizing and conducting internal and external ecosystem events, intending to communicate ecosystem structures and rule systems – *i.e.,* workshops and lectures held by Télecom Valley.

Practices, although classified into three distinct groups, occur concurrently and complementarily. The above examples reflect the proximity among the practices. It worth noting the recursive characteristic among the three groups of practices. While social structuring practices reinforce cognitive coherence in the field, the latter, in turn, allows actors to communicate and exchange knowledge as an essential path to jointly build social relationships. Still, the product of each group of practices is distinct.

Social structuring practices reflect on the construction of connection structures in the innovation ecosystem. In Sophia Antipolis, these connection structures account for the Business Pôle – a space that brings together actors from the institutional network, startups and large companies – and for Sophia Tech – a space that connects universities and research centers.

Practices of trust systems lead to the definition of rules and standards that will support interaction in the ecosystem. These rules are exemplified by collective project regulations that limit access to resources, whether financial, technical or infrastructure.

Practices for building cognitive coherence emphasize the production of mutual understanding in the ecosystem. In Sophia Antipolis, the narratives of *fertilisation croisée* and *châine de l'innovation* elucidate the shared understanding in the ecosystem. The terms appear in external communication about the ecosystem, empirical publications, and the interviews.

Finally, the interrelationship among practices is reflected in the dimensions of institutional logics for collaboration since they are also complementary and recursive. Connection structures facilitate the application of norms and rules, while materialization reinforces discourse. At the same time, the discourse on *fertilisation croisée* and the *chaîne de l'innovation* reinforce the existing structures and rules of collective projects developed within the ecosystem.

5.2 Tecnosinos

Tecnosinos is an innovation environment set in southern Brazil, in the city of São Leopoldo. Although administratively linked to the Universidade do Vale do Rio dos Sinos, its governance takes place in a triple helix, with the participation of the São Leopoldo City Hall and associations that represent the companies fiscally set in the ecosystem. Its development history, although recent compared to Sophia Antipolis, reflects the technological development processes in Brazil.

Initially founded as the IT Business Center (*Polo de Infomática*) in 2001, Tecnosinos was founded as an attempt to change the economic matrix of the region known as the Vale do Rio dos Sinos. Traditionally, this region, with a predominance of European immigrants, has developed with a close relationship with the footwear industry. With economic pressures from imports from Southeast Asian countries, especially from China, the "Vale [do Rio] dos Sinos has begun to lose market ... and this has created a difficulty for this leather and footwear sector" (Interviewee – TS08).

In response to this scenario of competitive pressures, a group of entrepreneurs from the IT sector found in the university the necessary opening to build a space that could foster technology development. According to the manager of a mature company in the park, "this group of entrepreneurs, who have been politically working with the city since the early 1990s, sought the university for the assignment of a place that could house the São Leopoldo IT Center" (Interviewee – TS07). This developmental history highlights, on the one hand, the intentionality of actors in the creation of a new

institution characterized by the region's economic reconversion (Zietsma & Lawrence, 2010), and on the other, the reflexivity on the impact of these actions on the organizational field (Lawrence & Suddaby, 2006).

The case Tecnosinos highlights the central role of private initiative, initially set on individuals and in an earlier moment organized in class associations, in the process of institutionalization of the innovation environment. According to a university director, "It was not UNISINOS that started the process; it was the entrepreneurs who came, UNISINOS understood the movement and the Mayor also understood" (interviewee – TS02). This feature differentiates the case Tecnosinos from Sophia Antipolis. Since in the French case, the construction of the ecosystem was pulled by public entities. This fact reflects on both infrastructure and current governance of the ecosystem.

Tecnosinos is an ecosystem that comprises a university, technology transfer institutes, entrepreneurship support structures, as well as startups and large companies. The territorial space of Tecnosinos is inserted in São Leopoldo – the city is located 35km away from Porto Alegre, the capital of the Brazilian state of Rio Grande do Sul, hosting a population of around 215 thousand people. The ecosystem expands to approximately 35 thousand m², holding 90 companies and approximately 6 thousand jobs. A professor highlights that: "of the ten largest contributors in the city of São Leopoldo, five are in Tecnosinos" (Interviewee – TS01). This fact underscores the economic reconversion of the region. Figure 14 illustrates the configuration of actors in Tecnosinos' innovation ecosystem, classified according to their performance in the field.

Figure 14 - Innovation Ecosystem of Tecnosinos
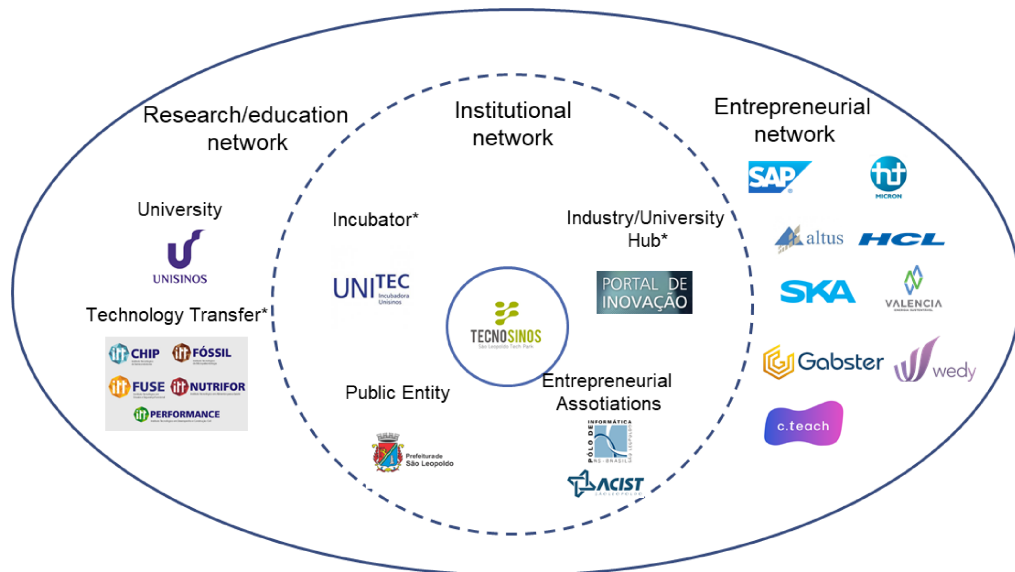
*structures administratively attached to UNISINOS University

Source: elaborated by the author.

At the heart of the ecosystem is the operational governance structure. A university director stands that, "Tecnosinos is composed of two types of governance, one strategically speaking, which takes place in triple helix - Business Association, São Leopoldo City Hall and the University - and an operational governance, a group of professionals with the task of dealing with all themes of the technology park development" (Interviewee – TS02). The administrative structure is directly linked to the university since the compensation of the team is made entirely with resources from UNISINOS. This structure, identified in figure 14 with the "Tecnosinos" logo, is responsible for "fostering and attracting startups [...], infrastructure management and attracting new investments" (Interviewee – TS02).

Within the institutional network of Tecnosinos is the strategic governance structure of the ecosystem. São Leopoldo City Hall represents the public decision-making body, whereas the industry is represented by two associations "with the power of only one vote" (Interviewee – TS02), the Innovation Pole Business Association (Associação do Polo de Inovação) and the Association Leopoldo Commerce, Industry and Technology (Interviewee – TS03). The latter has as associates not only companies located inside the territorial boundaries of the park but of the whole territory of the municipality. Its objective is to "provide measures to ensure the competitiveness of São Leopoldo companies" (Interviewee – TS13). Strategic governance is then completed with the participation of UNISINOS. In this group, "strategic actions of the park are

discussed and validated, such as the definition of technological axes, subsidies to companies and institutional projects" (Interviewee – TS02).

Still, as part of the institutional network, two parallel structures are responsible for promoting the connection between industry and academic research. Unitec is the incubator responsible for hosting and monitoring startups in the environment. According to a university director, "there is a space for new companies; it is an important space where the company can start its activities with the support of the university" (Interviewee – TS08). Another structure cited during data collection is the Portal de Inovação. Its main objective "is to be a link between university and society that seeks new technologies" (Interviewee – TS09). This link involves understanding the university's research capabilities and industry demand.

Tecnosinos' research and education network is formed by the university, its research laboratories, and technological institutes. Among these structures, there are researchers from sectors of technologies for health, renewable and socioenvironmental energies, engineering, information technology, communication, and digital convergence. UNISINOS is a private university ran by a nonprofit philanthropic religious association. The university began its teaching activities in 1974, and throughout its development, it moved from directing its activities to the formation in areas of the humanities for the development of technologies, especially information and communication technologies. As a result of this conversion, the Technological Institutes were founded with the objective of "translating academic research for applicability in the industry" (Interviewee – TS09). There are currently five institutes focused on "application of technologies in semiconductors, micropaleontology, functional safety, health and food, and construction" (Interviewee – TS08).

Finally, the network of business actors mixes big companies with startups. A university director reckons that: "there are 96 companies set in the ecosystem, of which 40 are mature companies" (Interviewee – TS02). The operating sectors of the companies set in the park follow strategic drivers: automation and engineering, communication and digital convergence, renewable energy, social and environmental technologies, information technology, health technologies. It is noteworthy that these axes reflect the research areas of the technological institutes. Thus, there is the "expectation that technology institutes will be able to provide technology development solutions for companies in the park" (Interviewee – TS01).

Although governance in triple helix is evident (Etzkowitz & Leydesdorff, 1995), the case of Tecnosinos presents a disparity in stakeholder participation. The university plays a central role in the development path of Tecnosinos (Bittencourt, 2019). The innovation ecosystem has its development history linked to the creation of the Computer Science Center and later the Tecnosinos Technology Park. Both structures are attached to UNISINOS. Also, the technological institutes, the Innovation Portal and the Unitec incubator are legally attached to the university. This feature is relevant because it highlights the university's power of action in different networks within the innovation ecosystem.

The structure of institutional, business, and research and innovation networks underpin interaction and collaboration between actors in the innovation ecosystem (Song, 2016). Although restricted to little evidence, it is possible to observe examples of collaboration in the Tecnosinos innovation ecosystem.

5.2.1 Collaboration in Tecnosinos

Data collected points that Tecnosinos' main attractiveness point is its proximity to the university to supply qualified workforce needs. Entrepreneurs interviewed indicate that their companies seek "access to qualified personnel from UNISINOS Engineering and Technology Schools" (Interviewee – TS04). Another entrepreneur points out that "most of the company's employees have studied or are studying at UNISINOS" (Interviewee – TS11). This organizational connection through the transit of individuals assists in the institutional reinforcement of the field (Barin Cruz et al. 2015), as individuals may conduct practices to maintain institutionalized standards (Lawrence, Suddaby & Leca, 2009).

The qualification of the workforce is in the development guidelines of the technology park, according to the relevance of human capital to the attractiveness of the ecosystem. This need makes the university seek to develop collaborative actions to integrate the educational chain with organizations close to the ecosystem. A director from the university explains that: "the Talent Program works with high schools in the region [...] where we receive students to get to know Tecnosinos, and we plant a seed of entrepreneurship, technology, and the future" (Interviewee – TS02). Although not directly linked to the development of technologies, these actions allow values that represent the institution, such as entrepreneurship, to be reinforced through the

education of the actors that will make up the organizational field in the future (Lawrence & Suddaby, 2006).

Collaboration for technological development purposes also points out in the case Tecnosinos. Manager of the technology park interviewed emphasizes the role of "open innovation projects with traditional economy companies that want to innovate using startups" (Interviewee – TS01). Project carried out with a local hospital is an example that seeks to develop technologies through collaboration with startups set in the ecosystem.

Events and awards held within the ecosystem are experienced in conducting the collaboration. Hackathons are held as "events that seek to involve startups, civil society, and academia for problem-solving through technology development" (Interviewee – TS02). These events are organized periodically by the technology park management body. Besides, awards assist in structuring collaboration. The *Roser* prize "fosters the emergence of matrix content ideas within the university [...] it is suggested that IT students and pharmacy students, for example, come together to come up with some business idea involving new technologies" (Interviewee – TS02). These practices assist in the construction of belief and value systems within the organizational field (Lawrence & Suddaby, 2006).

Although the urgency and need for interaction between companies in the ecosystem are evident in the view of respondents, examples of effectiveness are scarce. A director from the university explains that: "there is a movement to try to bring the companies in the park closer and make them synergistic [...], but in practice, this does not happen much" (Interviewee – TS08). This view is corroborated by another interviewed entrepreneur whose startup is incubated at Unitec: "here in the building I know few companies and I believe we could work together to develop new products, but the interaction is very little" (Interviewee – TS05). The misconnection between intention and outcomes is characteristic of an emerging organizational field since the need for change – *i.e.,* developing the culture of collaboration – is latent and some proposals for institutional change – *i.e.,* open innovation projects, hackathons – are apparent (Zietsma & Lawrence, 2010).

The collaboration between academia and industry is also observed from practices in the case Tecnosinos. In this collaboration profile, the Portal de Inovação has a fundamental role, because its goal is precisely to connect academia and industry through collaborative projects. Among the observed practices, the Innovation Academy

(Academia da Inovação) program stands out. This program comes from a public policy of the Federal Government that seeks to foster the Academic Doctorate for Innovation. In this program, "the fellows have a university advisor and a company advisor and develop their theses on the problems of the participating company" (Interviewee – TS08). Also, technological institutes "develop projects with park and non-park companies with the aim of solving company problems with university research capabilities" (interviewee – TS10). Although evidence exists, the feeling is that "despite all this, interaction is still scarce" (Interviewee – TS02).

The main problem observed as a barrier to university-industry interaction is cognitive dissonance. Although efforts point out, the distance of the mindset between academia and industry is a concern on both sides of the collaboration. An entrepreneur points out that "the language of the university is different from ours; we seek practical application in 100% of cases and there, there is a great concern with the publication" (Interviewee – TS15). On the other hand, a representative from the university notes that "companies cannot bring problems that may be clear enough that researchers can work on developing solutions" (Interviewee – TS10). This feature once again reinforces the existence of an organizational field in transition, where different parts hold different views on the same theme (Zietsma & Lawrence, 2010).

Even though UNISINOS holds different structures to act on the ecosystem directly – *i.e.,* Technology Institutes, Portal de Inovação, Unitec – the collaboration within its complexity is evident. The Portal de Inovação sought to bring the university's services closer by creating project offices. In these offices, "lawyers, supply technicians, administrative technicians, and researchers are together in the same space, they know the importance of what they are doing, so this has shortened the lead time, shortened the time for bureaucratic processes to serve the industry" (Interviewee – TS08). Physical structures capable of connecting actors in the ecosystem form one of the enabling elements of collaboration inside the ecosystem (Song, 2016).

Although evidence of collaboration in the Tecnosinos innovation ecosystem is scarce, there is a noticeable perception of a business-friendly environment. An interviewee linked to the Portal de Inovação points out that "society understands that it is important, […] we have had much demand from companies seeking support in the technology park, in the university's science and technology system, and this took a long time" (Interviewee – TS08). This perception is complemented by an entrepreneur

who reflects that "our company's performance in the park is positive, we have already gone through two stages of expansion and we are under the construction of the third" (Interviewee – TS04)

Positive results regarding ecosystem collaboration found on elements of social structuring, trust system configuration, and cognitive coherence. Subsequent sections highlight the practices of actors that lead to the construction of these elements.

5.2.2 Social Structuring in Tecnosinos

Narratives that reinforce the use of innovation infrastructure, startup supporting process, and interaction between academia and industry demonstrate social structuring in Tecnosinos. The narratives highlight practices analogous to institutional work of searching political and regulatory support, and connection between actors with distinct positions in the organizational field (Lawrence & Suddaby, 2006; Empson, Cleaver & Allen, 2013). Based on the typology of practices proposed in the literature, no evidence could sustain the existence of institutional work of social mobility (Waldron et al., 2015) in the Tecnosinos case.

UNISINOS mainly conduct the institutional work practices that lead to social structuring for collaboration in Tecnosinos. By establishing different agencies – *i.e.,* Portal de Inovação, Technology Institutes, Unitec – the university may implement its strategic vision of innovation ecosystem development as it expands its power on the field. According to a university director, "the university decided to make that influence not only on education but also on education through technology. It changes the way the university behaves." (Interviewee – TS08). This view is complemented with the report of one of the university-linked respondents: "the business and technology schools, the park, the Technology Institutes, the Portal de Inovação, the incubator, all that is there, is understood as important to spread the innovation culture in the ecosystem." (Interviewee – TS09).

The narrative of the employment of Tecnosinos' innovation infrastructure goes through the definition of the main tools that allow the development of creativity within the field. A representative of the Portal de Inovação points out that "in the park, there are auditoriums, laboratories, FabLabs, equipment such as 3D printers, laser cutting […] companies have all this structure available" (Interviewee – TS08). These structures have their shared use among ecosystem participants. Another director sustains that:

"the main structures needed for prototyping are common use, everyone can use it" (Interviewee – TS02).

In addition to prototyping structures, the Technology Institutes represent a relevant structure within Tecnosinos' innovation ecosystem. The Technology Institutes are installed "with state-of-the-art equipment in their laboratories that allow researchers to develop technology innovations in their field" (Interviewee - TS09). The creation purpose of the Technology Institutes was to "promote the applicability of scientific research to assist in the development of new products for companies in the market" (Interviewee – TS10).

The integration between actors highlights the institutional work of connecting actors with different social positions. This practice reflects joint and shared action among actors positioned at different points in the social hierarchy (Empson, Cleaver & Allen, 2013). The Innovation Portal, the Unitec incubator, the Technology Institutes, and the executive governance body of Tecnosinos maintain the ecosystem innovation infrastructure.

Unlike the practice of connecting actors with different social positions observed in Sophia Antipolis, the network of actors that maintains innovation structures at Tecnosinos is directly linked to the university. By highlighting UNISINOS as an organizational actor in the field, it worth noting that the university shapes its network with the creation of different agencies positioned at different points in the organizational field. The Portal de Inovação holds a position of direct contact with companies outside the field. The Unitec incubator deals directly with startups and entrepreneurs installed or who will physically settle within the boundaries of the innovation ecosystem. Finally, the Technology Institutes holds a position in direct contact with researchers linked to the university. Thus, the creation of this network reflects an institutional working practice that seeks to increase the capillarity of the organizational actor to implement its strategy. This practice is proposed as *grounding strategy*.

The second narrative brings the use of connection structures between academia and industry. This narrative highlights the Portal de Inovação and the Technology Institutes. According to a university director, "the Portal de Inovação was built to be the link between university and society" (Interviewee – TS08). As the Portal de Inovação is directly linked to UNISINOS, the construction of this structure reflects the university's intentionality in seeking to get closer to the market. A representative of one of the structures to connect academia and industry highlights that: "the Portal de Inovação is

a hub between business, government, and the university, the technological research part of the university" (Interviewee – TS10).

The narrative of the use of connection structures between academia and industry also reflects the building of bridges between the ecosystem and external actors. An interviewee linked to the Technology Institutes points out that "most of the companies that hire our services are not settled in Tecnosinos" (Interviewee – TS09). This dynamic of action demonstrates the willingness of the actor to work on the margins of the organizational field (Zietsma & Lawrence, 2010), seeking its expansion through the promotion of ecosystem capacities. Another interviewee linked to the Portal de Inovação highlights the change in behavior concerning the market. A director form university reckons: "we realized the need to work prospectively, looking for industries that can bring their R&D needs into our ecosystem" (Interviewee – TS08). Here again, the actor's narrative brings the willingness to promote and transform local reality through a process of institutionalization (Lawrence & Suddaby, 2006; Jepperson, 1991).

The practices for connecting academia and industry in Tecnosinos evoke the institutional work for connecting actors with different positions in the organizational field (Empson, Cleaver & Allen, 2013). As specific to the case, the actors endeavor this practice to build a hub among actors positioned inside and outside the boundaries of the organizational field. Then, this practice is proposedly named as *building a hub*.

In time, the Portal de Inovação also appeals to materiality for institutionalizing the academy/industry relationship. A university director stands: "in our society, it is physically important to have a building, because people only believe in what they see" (Interviewee – TS08). Materials mark essential steps in the institutionalization process (Mazza & Pederssen, 2004). Also, infrastructure is an integral part of the formation of connectors that facilitate collaboration in innovation ecosystems (Hwang & Horowitt, 2012). The Portal de Inovação has a hybrid structure, connecting academia and industry through digital tools and providing physical space to house joint R&D project teams.

> "We [Portal de Inovação team] identify the need of some company, we identify who at the university might solve this problem, we build a proposal, this project is approved, and if it needs a space to be developed, the team can use the structure of the building" (Interviewee – TS08).

The third narrative evident in the Tecnosinos case is the use of startups' supporting structures. A director from the university assumes that: "Tecnosinos is a large ecosystem, within this ecosystem, we have our incubator, with a physical incubation structure of up to 60 companies" (Interviewee – TS02). The incubation process at Unitec involves monitoring up to 3 years of startups. The relevance of this process is evident: "It is an important space where the company can start its activities with the support of the university; this is the role of the incubator that is next to the park." (Interviewee – TS01). The university uses startups' follow-up structures to stimulate interaction between companies with "informal living spaces, coworking offices, and shared auditoriums" (Interviewee – TS01).

The use of the startup supporting structure involves institutional work practices seeking political and regulatory support (Lawrence & Suddaby, 2006). According to a director from the university, "the Secretary of Science and Technology of the State Government has a program of parks and incubators in Rio Grande do Sul, so there is a way to be part of it. Public policies that can facilitate business are built there." (Interviewee – TS02). Institutional actors use this space to validate the structures and installed capacity in the innovation ecosystem. The connection between parks and incubators is also represented by the agency of REGINP – Network of Innovation Environments, formed with the "objective of representing and leading the development agenda of technology parks for political discussion" (Interviewee – TS12). The seek for political and regulatory support is evidence of the institutional work for *building public policies* that will complement the institutionalization process.

5.2.2.1 Governance in the ecosystem of Tecnosinos

Tecnosinos' governance dynamics bring the fourth practice of institutional work that impacts on social structuring of the innovation ecosystem. Ecosystem governance occurs in two complementary stages. In a first stage, of strategic nature, the constituents are UNISINOS (university), the City Hall of São Leopoldo (government) and the associations ACIST-SL and Associação do Polo de Informática (industry). All ecosystem guidelines come from the strategic governance: "decisions need to reach a consensus among all the three entities to go forward" (Interviewee – TS03). In a second stage, of executive nature, UNISINOS fully assumes the actions concerning the administrative processes of maintaining the innovation ecosystem. A director from

the university states: "this group of professionals [linked to UNISINOS] has the task of addressing all topics concerning the development of the technology park, [...] from fostering and attracting startups to infrastructure management, attracting new investments, all this is on the agenda of this executive group "(Interviewee – TS02).

Within the governance structure, the institutional work of advocacy is remarkable (Lawrence & Suddaby, 2006), since the search for political support will reflect on the ecosystem dynamics. A representative from an entrepreneurial association recognizes that: "working on consensus among all parts of the triple helix is no simple task" (Interviewee – TS03). The difficulty in producing consensus is even more relevant when it comes to investment and expansion decisions concerning the park. Tecnosinos' geographic territory is "partly owned by private companies, partly owned by the municipality and partly owned by the university" (Interviewee – TS06). This complexity in sharing spaces depends on concessions from each party. A director from the university highlights that: "when space is lacking or when someone wants to expand [...], negotiations begin to make investment feasible. This process is long but resolute." (Interviewee – TS02). This consensus-building practice around strategic decisions is proposed as *governing*.

Table 15 summarizes the evidence observed in the Tecnosinos case for institutional work practices that impact social structuring. The institutional work of advocacy (Lawrence & Sudaby, 2006) and connecting actors with different social positions in the field (Empson, Cleaver & Allen, 2013) support the observed practices.

Table 15 - Narratives of institutional work to social structuring in Tecnosinos

Institutional Work	Narrative	Practice	Excerpt
Connection among actors with distinct positions Social mobility	Innovation structures	Grounding strategy	"The business and technology schools, the park, the Technology Institutes, the Portal de Inovação, the incubator, all that is there, is understood as important to spread the innovation culture in the ecosystem." (Interviewee – TS09). "The main structures needed for prototyping are common use, everyone can use it" (Interviewee – TS02).
	Connection industry/ academy	Building a hub	"The Portal de Inovação is a hub between business, government, and the university, the technological research part of the university" (Interviewee – TS11). "The Portal de Inovação was built to be the link between university and society" (Interviewee – TS08).
Advocacy	Startup supporting structures	Building public policies	"The Secretary of Science and Technology of the State Government has a program of parks and incubators in Rio Grande do Sul, so there is a way to be part of it. Public policies that can help facilitate business are built there." (Interviewee – TS02). "[The Network of Innovation Environment – Reginp] has the objective of representing and leading the development agenda of technology parks for political discussion" (Interviewee – TS12).
	Governance	Governing	"Decisions need to reach a consensus among all the three entities to go forward" (Interviewee – TS03). "When space is lacking or when someone wants to expand [...], negotiations begin to make investment feasible. This process is long but resolute." (Interviewee – TS02).

Source: elaborated by the author.

In addition to social structuring, the configuration of trust systems is another enabler of collaboration in the Tecnosinos innovation ecosystem. The subsequent section reports evidence of institutional work practices for building trust.

5.2.3 Configuration of trust systems in Tecnosinos

The case Tecnosinos portrays four practices related to institutional work to configure trust systems as an enabler of collaboration in the innovation ecosystem. These practices echo the institutional work of definition – *i.e.,* the foundation of rule systems that give identity status (Lawrence & Suddaby, 2006) – and the institutional

work of configuration of limits – *i.e.,* constructing organizational field boundaries that define space, and rules of action and conduct (Zietsma & Lawrence, 2010).

The four practices all together may define the technological specialization of the ecosystem as a sponsor of trust among participants. A representative from an entrepreneurial association stands: "besides the geographical boundary, there is also a boundary by company type, because, in Tencosinos, there is no manufacturing. Only technology-related services are allowed to be installed in the ecosystem." (Interviewee – TS06). Although practices may differ, the product of technological specialization is similar between the cases Tecnosinos and Sophia Antipolis. Through specialization, "entrepreneurs, researchers and teachers who relate or will relate to Tecnosinos already know which lines of work are developed here" (Interviewee – TS01).

Three narratives support evidence of institutional work practices to configure trust systems in Tecnosinos: startup support dynamics, rules for exchanges between academia and industry, and the discourse on *portadores de futuro*. The first narrative reflects Unitec's efforts as a central actor, accompanied by the executive governance of the technology park, ACIST-SL, and Portal de Inovação, to promote the development of startups in the ecosystem. The second narrative has the Portal de Inovação as its central actor and reflects the institutional work to ensure best practices between private companies and research centers in the development of joint projects. In the last narrative, with no specific focus on a single actor, the reports bring the definition and support of the strategic axes that give identity to those companies and research centers that make up the ecosystem.

The first narrative brings the dynamics of support to startups in the innovation ecosystem. It is worth the recall that the main supporting structure for this process is the Unitec incubator, linked to UNISINOS. Entrepreneurs are encouraged to bring their ideas for developing managerial skills in the incubator. The incubation process can take up to 3 years of follow-up and subsidy to the entrepreneur. A professor from the university highlights: "from incubation, we have a training program that is mandatory for the entrepreneur" (Interviewee – TS01). This first aspect of obligation reflects the intentionality and coercive power of the institutional actor (Singh & Jayanti (2013). An entrepreneur recognizes that: "the incubation program deals with management skills, such as training in financial management, use of corporate typologies, taxation, branding, and patents" (Interviewee – TS14). By defining the themes of entrepreneurial

managerial skills formation, the actor assumes the institutional work of definition, since it determines the limits of participation in the field (Lawrence & Suddaby, 2006).

In addition to managerial skills, the dynamics of support to startups seek to prepare the emerging company to seek interrelationship with actors inside the innovation ecosystem or even outside its boundaries. An entrepreneur reckons that: "during the incubation program, we participated in exchange actions with other incubated companies, such as pitch rounds, or even the preparation of fundraising projects" (Interviewee – TS05). These actions foster the setting of identity in the organizational field. Another interviewee comments that "one of the reasons that bring small companies to settle here is the possibility of bringing Tecnosinos on the business card, almost like a company surname" (Interviewee – TS05). These actions are proposedly named as practices of *implementing rules for startup support*.

The second narrative deals with the definition of rules that will regulate the interaction between academia and industry. In this narrative, two practices are observable: the mapping of internal capacities of the innovation ecosystem and the mapping of market demands for technological development. Both practices complement each other and are enacted by the Portal de Inovação.

The Portal de Inovação holds processes aimed at mapping capacities installed inside the Tecnosinos ecosystem boundaries. The search considers the university's formation structures: "we look this way: which schools form students with this characteristic of having integration with companies for technological development? Then we come to some areas, for example, information technology, engineering, management, and so on" (Interviewee – TS09). By taking this mapping action, the institutional actor delimits the areas of interaction between academia and industry in an institutional work of configuration of limits (Zietsma & Lawrence, 2010). Within these limits, the action of the field participants is modeled to allow interaction that might take place. This practice is proposed as *mapping internal capabilities*. Thus, the role of the Portal de Inovação is twofold, "[...] on the one hand, it seeks to compile the internal capabilities of ecosystem researchers and developers and, on the other hand, it prospects in the market for companies wishing to hire these R&D services." (Interviewee – TS08).

Identification and prioritization techniques endorse the action of mapping the external demands of the industry. A representative from the structures claimed to pursue the connection between academia and industry stands: "we propose an

ideation process and, from there, we often get a more assertive view of what the company needs. We can be more purposeful this way." (Interviewee – TS10). In any case, demand mapping respects the internal capacities of the ecosystem. Another representative from this same structure complements: "while we can identify exactly what the company needs in terms of R&D, we need to match with what we identify as internal service skills" (Interviewee – TS09). After mapping, the rules of interaction between academia and industry are founded. A director from the claims: "so, the company hires the university and has a scope, let's do this and that, the resources used will be these, the time used will be this, secrecy clause, intellectual property clause, all must set. It is a long negotiation." (Interviewee – TS08).

Technicians of Portal de Inovação prospect not only among companies settled in the ecosystem. As an interviewee reports, "it is expected that the companies here are those that preferentially consume the university's R&D services, but in practice, this is not what happens" (Interviewee – TS09). The primary consumers of the labs and research services provided by the technology institutes are companies that orbit the ecosystem. According to a director from the university, "usually, these companies start the relationship with the ecosystem through the Technology Institute. If the experience is positive, they may set up an office in the park" (Interviewee – TS08). An alternative is the recurrence of the relationship by complementary projects. A representative from the structures engaged in the connection between academia and industry stands: "after the industry demand was defined, the first contract was made, before finishing this contract we already made two more, before finishing these two we have five proposals that are being analyzed today" (Interviewee – TS10). Through this recurrence, the actor manages to overcome the limiting barrier of the geographical layout of the organizational field (Waldron, Fisher & Navis, 2015) and builds new limits defined by the interaction within the field. These actions are proposed as *mapping industry demands*.

It is noteworthy that the interaction between academia and industry in the Tecnosinos innovation ecosystem is based much more on commercial relationships between actors than collaboration on joint construction. A director from the university recognizes: "there are collaborative projects, university-business cooperation, or perhaps a group of companies, but this is very rare" (Interviewee – TS08). According to the interviewees, the structures that guarantee the confidentiality of the information for this type of contract exist: "[...] we have experienced professionals that guarantee

the intellectual property in joint actions in our project office" (Interviewee – TS09). However, the timing and recurrence of interactions is a relevant factor in building trust: "we have an ongoing project with a company where we spent more than a year just discussing the confidentiality clause and intellectual property. After this first contract, the others were made much faster" (Interviewee – TS10). Also, the cognitive distance between academia and industry seems to impact the construction of collaboration between these actors – a topic deepened in section 6.2.4.

The third narrative of the configuration of trust systems in Tecnosinos brings the definition of strategic axes of action of the innovation ecosystem. These axes, defined by respondents as "*portadores de futuro*" (Interviewee – TS01), are responsible for delimiting the acceptable economic sector for the establishment of companies, as well as defining the strategic drivers for technological development.

> "There was a consensus that five areas that companies are working now are the '*portadores de futuro*', that is, Tecnosinos' strategic drivers: automation and engineering; communication and digital convergence; renewable energies and social and environmental technologies; information technologies; health technologies" (Interviewee – TS02)

The strength of this delimitation is present in the ecosystem advertising materials. Figure 15 is an excerpt from the Tecnosinos presentation webpage, with emphasis on the five *portadores de futuro* to classify the companies established inside the park. This delimitation is a clear parallel with the institutional work of configuration of boundaries, where the actor builds the boundaries of the organizational field to define space and the rules of action and conduct (Zietsma & Lawrence, 2010).

Figure 15 - Tecnosinos strategic axes
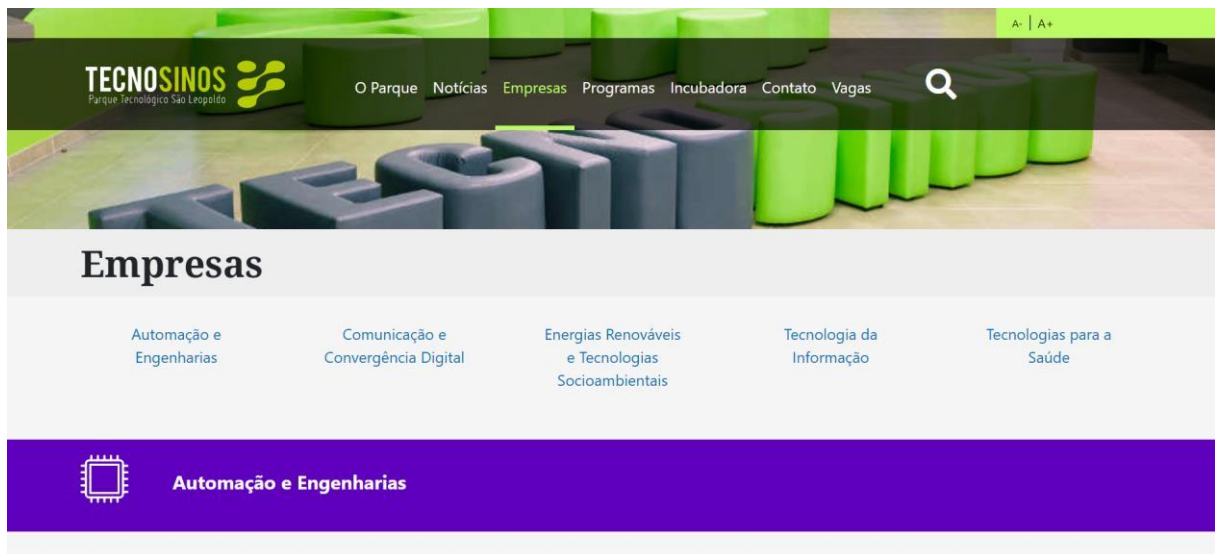
Source: elaborated by the author.

Strategic governance plays a fundamental role in defining the *portadores de futuro*. The decision on what will be the strategic axes of Tecnosinos is a "[...] decision of strategic governance, that is where the strategic drivers of the park come from: to where it will grow, what kind of company we will bring, what our focuses of action are" (Interviewee – TS03). However, the weight on the decision is not equal, according to interviewees. The decision on the strategic axes "is heavily influenced by UNISINOS, which will sustain its position from its direction in education to the technologies that should be worked on to make employability possible after graduation" (Interviewee – TS08). Also, another interviewee emphasizes the role of the industry "that is in direct contact with the market, which portrays the movement and the consumer's desire for new technologies" (Interviewee – TS06). The industry acts as a channel for understanding the consumer market.

Finally, the *portadores de futuro* play the role of rules for delimiting participation in the field. A director from the university stands: "we are a park guided by technology specialties, so we only accept companies that develop products and process services in these technology areas" (Interviewee – TS02). This excerpt highlights the intentionality and coercivity of actions, typical of institutional work (Lawrence, Suddaby & Leca, 2009). These actions are proposed as *bounding axes of action*.

Table 16 summarizes the institutional work practices observed in the case Tecnosinos for the configuration of trust systems. These practices are analogous to

institutional work of definition (Lawrence & Suddaby, 2006) and configuration of limits (Zietsma & Lawrence, 2010).

Table 16 - Narratives of institutional work to configuring trust systems in Tecnosinos

Institutional Work	Narrative	Practice	Excerpt
Definition	Startup supporting dynamics	Implementing rules for startup support	"The incubation program deals with management skills, such as training in financial management, use of corporate typologies, taxation, branding, and patents" (Interviewee – TS14).
Configuration of limits	Exchange rules for academia / industry interaction	Mapping internal capabilities	"We look this way: which schools form students with this characteristic of having integration with companies for technological development? Then we come to some areas, for example, information technology, engineering, management and so on" (Interviewee – TS09) "Our project office works twofold. On the one hand, it seeks to compile the internal capabilities of ecosystem researchers and developers and, on the other hand, it prospects in the market for companies wishing to hire these R&D services" (Interviewee – TS08)
		Mapping industry demands	"So, the company hires the university and has a scope, let's do this and that, the resources used will be these, the time used will be this, secrecy clause, intellectual property clause, all must set. It's a long negotiation" (Interviewee – TS08) "After the industry demand was defined, the first contract was made, before finishing this contract we already made two more, before finishing these two we have five proposals that are being analyzed today" (Interviewee – TS10)
	Portadores de futuro	Bounding axes of action	"There was a consensus that five areas that companies are working now are the 'portadores de futuro'." (Interviewee – TS02). "It is the decision of strategic governance, that is where the strategic drivers of the park come from: to where it will grow, what kind of company we will bring, what our focuses of action are" (Interviewee – TS03)

Source: elaborated by the author.

The configuration of trust systems allows interaction to appear in innovation ecosystems (Song, 2016). However, recurrent and purposeful interaction requires cognitive coherence between actors with distinct characteristics (Hwang & Horowitt,

2012). In the case Tecnosinos, the construction of cognitive coherence intends to mitigate the distance between the mindset of academia and industry.

5.2.4 Cognitive coherence in Tecnosinos

The Tecnosinos innovation ecosystem is a maturing organizational field (Zietsma & Lawrence, 2010; Bittencourt, 2019). Evidence points out that interaction concentrates on small groups shaped by individuals who share the same understanding (Mazza & Pedersen, 2004). Although the cognitive distance between academia and industry is a significant concern in research elsewhere in the world (Ankrah & Omar, 2015; Muscio & Pozzali, 2013), the case Tecnosinos points to this as the main challenge for building cognitive coherence in the field.

The distance of perspectives into the benefits of university-business collaboration is evident on both sides of the interaction. A university representative interviewed reports that: "there are still companies that believe that the university should work without covering its costs [...] there must be a technology transfer, but this transfer has to be paid." (Interviewee – TS09). This account goes back to the discussion between the value produced and the value perceived of research carried out within the university (Lascaux, 2019). Another respondent points out that "maybe that the projects under discussion are not on the frontier of knowledge, they are projects of a slight improvement, [...] if you do or do not, it may not make much difference to the company" (Interviewee – TS08).

There is still a distance in objectives and methods of construction and application of knowledge in the view of respondents. A mid-manager from a mature company set in the innovation ecosystem tells: "the development time of academia and industry is different. There, the appreciation for the publication makes things take longer, and here we need speed" (Interviewee – TS04). The evidence points to the distance of objectives between industry – *i.e.,* search for fast application to solving specific issues – and academia – *i.e.,* concern about the scientific validity of research. This distance leads to the understanding that "companies have a hard time thinking that the university has something to offer them, just as university researchers have a hard time understanding that companies have something to offer them." (Interviewee – TS07).

The set of evidence shows that the cognitive distance between academia and industry in the Tecnosinos innovation ecosystem is still relevant. However, a group of actors carries actions that aim at extenuating this distance. The central actor in conducting actions for this purpose is the Portal de Inovação since its main reason for existence is precisely to bring both ends together.

The case Tecnosinos presents four practices related to institutional work to build cognitive cohesion as an enabler of collaboration in the innovation ecosystem. These practices have characteristics of the institutional work of configuration of belief systems – *i.e.,* reshaping the moral and cultural foundations associated with actions of individuals in the organizational field (Lawrence & Suddaby, 2006) – definition of sense-making schemes – *i.e.,* building cognitive and cultural convergence between actors (Total, 2015) - theorization – *i.e.,* development and specification of abstractions (Lawrence & Suddaby, 2006) – education – *i.e.,* education of actors in the skills and knowledge required to support the new institution (Lawrence & Suddaby, 2006).

Four narratives highlight the practices of institutional work to build cognitive coherence in the Tecnosinos case. These practices are related to the definition of a long-term strategic plan, the connection between academia and industry, internationalization of technology park activities, and qualification of installed capacities.

The first narrative brings the construction and implementation of a long-term strategic plan. A professor brings: "we have in Tecnosinos something that guides us, and that is a strategic decision: the Masterplan of development" (Interviewee – TS01). These strategic guidelines align the vision of the future among the actors positioned at the forefront of the institutionalization process of collaboration in the innovation ecosystem. In addition to setting quantitative goals, collaboration development is envisaged in Masterplan: "[...] We have just reviewed this Masterplan and set goals for increasing the number of both startups and consolidated companies. Plus, we have qualitative goals, such as promoting collaboration and the internationalization of companies" (Interviewee – TS02).

The action of defining a joint strategic plan for ecosystem development has characteristics of the institutional work of configuring belief systems (Lawrence & Suddaby, 2006). By adopting these measures, the actors align with each other their way of action on shared guidelines. This action, therefore, is proposed as a practice of *setting a common vision of the future*.

The second practice of institutional work is acknowledged by the narrative of mutual gains from the relationship between academia and industry. This narrative is present in the discourse of actors linked to the Portal de Inovação. A director from the university stands: "the Portal de Inovação has succeeded in recent years by making companies understand that they are important to the university – and making the university understand that companies are important." (Interviewee – TS08). Another interviewee complemented this view: "We have been visited by the staff of the Portal de Inovação demonstrating the possibilities of partnership with the university and Technology Institutes" (Interviewee – TS07).

It is clear the intentionality of the institutional actor Portal de Inovação in seeking to bring academia and industry closer. By taking this action, the actor performs practices analogous to the institutional work of defining sense-making schemes (Topal, 2015). These schemes seek to converge actors around the benefits of realizing collaboration between academia and industry. Thus, these actions are proposed as practices of *highlighting mutual gains*.

The third narrative sheds light on the internationalization of the innovation ecosystem. The process of opening to the external market is already foreseen in the long-term strategic planning of the technology park. This movement meets the need to foster diversity within the innovation ecosystem (Hwang & Horowitt, 2012), yet poses the challenge of overcoming obstacles of cognitive distance in the field (Schwartz & Bar-El, 2015). Two complementary programs developed by executive governance of the ecosystem seek to promote internationalization. According to a director from the university, "'Softlanding' is a program aimed at promoting and receiving companies from abroad that will settle in Tecnosinos. The main challenge is to converge foreign culture with Brazilian culture." (Interviewee – TS02). The 'Take Off' program aims to "prepare national companies to identify opportunities in the foreign market" (Interviewee – TS02). Both programs set specific actions of cultural convergence.

Tecnosinos comprises, inside its boundaries, companies of Asian, European, and Latin American origin. The proximity between companies of different origin but clustered in a single geographic location requires the definition of shared language and terminology. A professor from the university reckons: "coexistence proposes a cutting-edge, global language, so if you talk to an Indian, Chinese company about power redundancy, everyone knows what it is; you talk about prototyping FabLab, everyone knows what it is" (Interviewee – TS01). At any rate, even though executive governance

proposes common cognitive models, international companies end up importing their models. Another interviewee sustains that "whoever is here ends up absorbing this globalization because it relates to big and small [companies], and this, in this exchange, international requirements are very present" (Interviewee – TS11).

This set of actions that seek to promote cognitive coherence in the ecosystem is analogous to institutional work of theorizing, as it seeks to define abstract models – *i.e.,* FabLab, power redundancy – that can be shared and understood among all actors in the field (Lawrence & Suddaby, 2006). Actions brought by international companies and the executive governance of the innovation ecosystem are proposed as a practice of *developing common terminology*.

The fourth narrative of building cognitive coherence in the innovation ecosystem elucidates the qualification of installed capacities. The qualification of human resources is a definite challenge in the competitiveness of the Tecnosinos innovation ecosystem. Concern about qualified personnel appears in 8 of the 15 interviews. According to a representative of an entrepreneurial association, "Part of the park's attractiveness is related to its proximity to the university, as companies understand that they will have access to qualified labor force" (Interviewee – TS06) or "there is a recurrent deficit of approximately 400 work positions that cannot be filled due to lack of staff qualification". The executive governance, to overcome this challenge, promotes events, awards, and programs aimed at stimulating the culture of entrepreneurship and technological development at all levels of education.

The program *Talentos* aims to promote Tecnosinos and career opportunities in technology development for primary and secondary students in the Vale do Rio dos Sinos region. A director from the university considers that: "the goal of the Talents program is 1,200 students and this year, we also work on diversity and inclusion as program objectives" (Interviewee – TS02). Technicians from the executive governance and even startup entrepreneurs come to schools to introduce Tecnosinos. Besides, "student-guided tours are conducted periodically so that children and adolescents can awaken to the possibilities of technological careers" (Interviewee – TS02).

In addition to programs, awards are used to reinforce the entrepreneurial culture and technological development at Tecnosinos. Like the Pépite program in Sophia Antipolis, the Roser prize aims to reward projects that present innovative solutions to problems in the university environment. The Roser prize also awards collaboration between different areas of knowledge. A professor from the university stands: "we

foster the emergence of matrix content ideas within the university, so we encourage engineering students, math students to work together with students of pharmacy, pedagogy, for example" (Interviewee – TS01).

Finally, events are also applied in the case Tecnosinos for configuring the organizational field (Hardy & Maguire, 2010). Events are held to bring academia and industry closer, such as the events promoted by the Portal de Inovação: "we invite research groups, which are linked to postgraduate programs, to make periodic presentations to society at the Portal de Inovação" (Interviewee – TS09). Events that promote exchanges between companies in the ecosystem are also highlighted: "we organize thematic events and seminars on emerging themes and invite all entrepreneurs in the park" (Interviewee – TS01).

The set of actions observed in the ecosystem's capacities qualification narrative has characteristics of institutional work of education, where skills and knowledge are passed on in the field to support the new institution (Lawrence & Suddaby, 2006). These actions are proposed as practices of *holding events and awards*.

Table 17 brings together the institutional work practices observed in the case Tecnosinos for building cognitive coherence in the organizational field. These practices are analogous to the institutional work of configuration of belief systems (Lawrence & Suddaby, 2006), the definition of sense-making schemes (Topal, 2015), theorization (Lawrence & Suddaby, 2006) and education (Lawrence & Suddaby, 2006).

Table 17 - Narratives of institutional work to cognitive coherence in Tecnosinos

Institutional Work	Narrative	Practice	Excerpt
Configuration of belief systems	Masterplan	Setting a common vision of the future	"We have in Tecnosinos something that guides us, and that is a strategic decision: the Masterplan of development" (Interviewee – TS01) "[...]we have just reviewed this Masterplan and set goals for increasing the number of both startups and consolidated companies. Plus, we have qualitative goals such as promoting collaboration and the internationalization of companies" (Interviewee – TS02)
Definition of sense-making schemes	Mutual gains	Highlighting mutual gains	"The Portal de Inovação has succeeded in recent years by making companies understand that they are important to the university – and making the university understand that companies are important" (Interviewee – TS08)
Theorization	Internationalization	Developing common terminology.	"whoever is here ends up absorbing this globalization, because it relates to big and small [companies], and this, in this exchange, international requirements are very present" (Interviewee – TS11) "Coexistence proposes a cutting-edge, global language, so if you talk to an Indian, Chinese company about power redundancy, everyone knows what it is; you talk about prototyping FabLab, everyone knows what it is" (Interviewee – TS01)
Education	Qualification of internal capabilities	Holding events and awards	"We have an award called the Roser prize, it has been eight years this year, where we foster the emergence of matrix content ideas within the university." (Interviewee – TS01) "We invite research groups, which are linked to postgraduate programs, to make periodic presentations to society at the Portal de Inovação" (Interviewee – TS09)

Source: elaborated by the author.

The empirical observations of Tecnosinos allow positioning the institutional work practices and their impact on enabling elements for collaboration. Although the evidence of collaboration is punctual, the theoretical-conceptual framework seeks to present these observations graphically.

5.2.5 Theoretical-conceptual framework

The narratives of the case Tecnosinos highlight the set of institutional work practices that have the power to stimulate collaboration in the innovation ecosystem. Figure 16 presents the practices and their outcome in building elements that enable collaboration in the innovation ecosystem.

Figure 16 - Theoretical-conceptual framework Tecnosinos
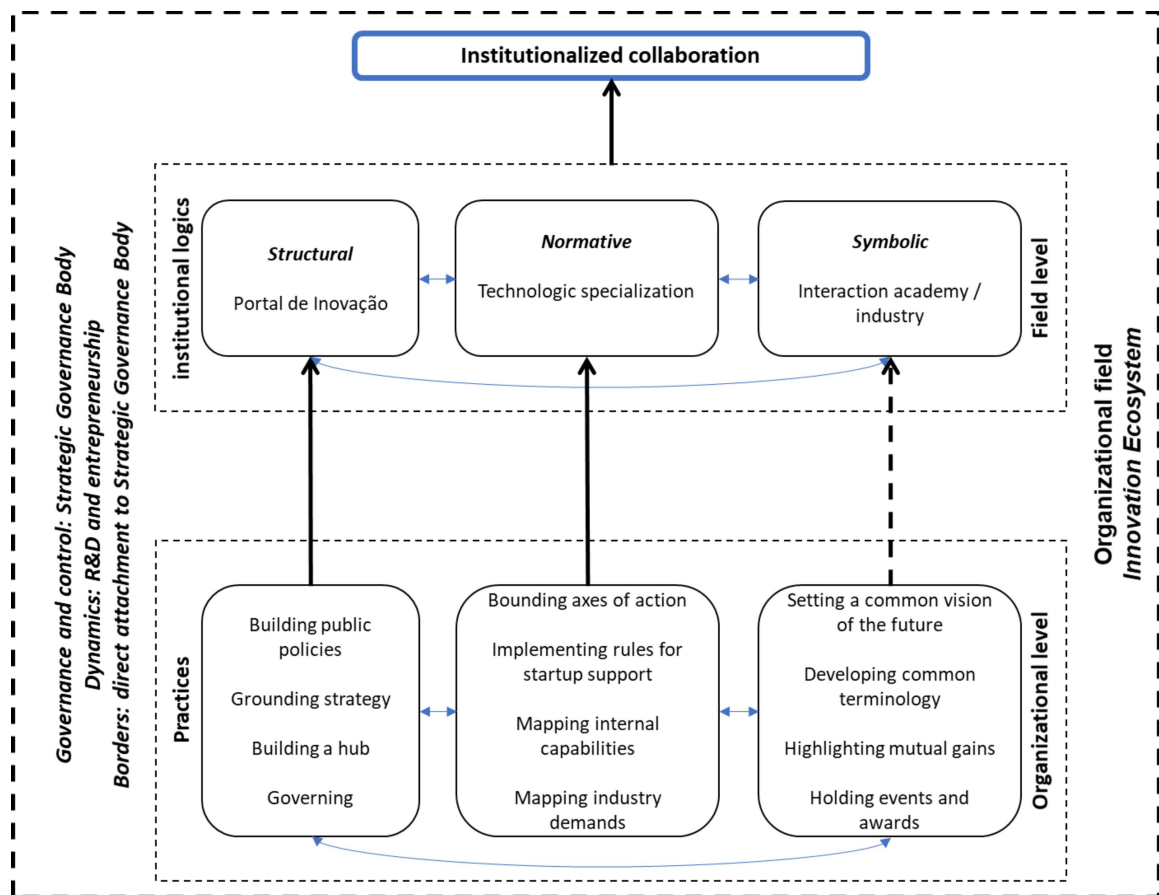
Source: elaborated by the author based on empirical observations and Lawrence and Suddaby, 2006; Empson, Cleaver and Allen, 2013; Thronton and Ocasio, 2008; Thomas & Autio, 2014.

Collaboration, as an institutionalized behavior in Tecnosinos is set within an organizational field reflecting structures for governance and control, dynamics for technological development and environmental borders (Mazza & Pedersen, 2004; Thomas & Autio, 2014). The governance of the ecosystem stands as the Strategic Governance Body, structured in triple helix with the participation of UNISINOS, São Leopoldo City Hall and industry associations. Technological development relies on the proximity between R&D departments of large and medium companies and research

institutes, and also on entrepreneurship under the incubation process. As a metaphor of the innovation ecosystem as a platform (Autio & Thomas, 2014), the Strategic Governance Body also defines the borders of the ecosystem since it is acknowledgeable the organizational actors directly or indirectly – *i.e.,* represented by associations – attached to the governance structure.

Empirically observed practices present characteristics of typification of institutional work for social structuring (Lawrence & Suddaby, 2006; Empson, Cleaver & Allen, 2013; Waldron et al. 2015), belief systems configuration (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010) and cognitive coherence (Lawrence & Suddaby, 2006; Topal, 2015). While observed at the organizational level, their impact is evident in the construction, maintenance, or disruption of institutional logics (Willmott, 2011).

Theoretical reflections allow identifying four social structuring practices in the case Tecnosinos empirically. These practices are analogous to institutional work of advocacy (Lawrence & Suddaby, 2006) and the work of connecting actors with different social positions (Empson, Cleaver & Allen, 2013). *Building public policies* reflects the effort of organizational actors such as UNISINOS and REGINP in their work of political and regulatory persuasion to influence the enactment of public policies that can benefit innovation environments in the region and the country. *Grounding strategy* is the practice adopted by UNISINOS to expand its action on the organizational field and reflects the creation of different structures – *i.e.,* Unitec, Portal de Inovação, Technology Institutes – to implement strategic guidelines such as the region's economic reconversion by technological development. *Building a hub* is the practice endeavored by the Portal de Inovação action that seeks to become a reference in the interaction academia/industry. For this, the actor applies actions seeking to map and connect supply and demand at the core of technological development. Finally, *governing* reflects the construction of collegiate decision-making schemes - *i.e.,* Tecnosinos' strategic governance.

The second set of practices seeks to build trust systems. Based on the theoretical underpinnings that reveal institutional work of definition (Lawrence & Suddaby, 2006) and configuration of organizational field limits (Zietsma & Lawrence, 2010), the empirical case produces four observable practices. *Bounding axes of action* is the practice of defining the technological lines that will be developed in the innovation ecosystem – *i.e.,* automation and engineering; digital communication and conversion;

renewable energies and social and environmental technologies; information technology; and technologies for health. *Implementing rules for startup support* is the practice of delimiting the methods of monitoring startups in the ecosystem. The Portal de Inovação conducts the last two practices as *mapping internal capacities* and *mapping industry demands* as a way to delimit the field for collaboration between academia and industry.

The third set of practices seeks to build cognitive coherence in the organizational field. These practices reflect the construction of shared moral and cultural patterns in the field (Topal, 2015) through the creation of myths and symbols, theorizing, and education of actors (Lawrence & Suddaby, 2006). Setting a *common vision of the future* is the practice that seeks to define common belief systems in the ecosystem – *i.e.,* Masterplan of development. *Developing common terminology* is the attempt to produce cognitive and cultural convergence in the environment – *i.e.,* international requirements for setting foreign companies in the ecosystem. *Highlighting mutual gains* is the practice perpetrated by the Portal de Inovçação in an attempt to bring academia and industry closer by elucidating the benefits of collaboration. Finally, the practice of *holding events and awards*, similarly to that observed in Sophia Antipolis, brings the realization of field configuration events and awards (Hardy & Maguire, 2010) to educate actors about the entrepreneurship culture, and collaboration for technological development.

These three sets of practices occur concurrently and are interrelated. For instance, practices of building public policy will carry out the axes of technological development and the actions predicted in the Masterplan of development. By *mapping* both internal environmental capacities and industry demands, the Portal de Inovação concomitantly performs actions foreseen in the practice of *highlighting mutual gains*. The interrelationship between practices is evident; however, the outcome of each group of practices is distinct.

Social structuring practices lead to building and sustaining connection structures – *i.e.*, Portal de Inovação and strategic governance committee. The Portal de Inovação is typically a hub structure that seeks to connect supply and demand in the innovation ecosystem (Autio & Thomas, 2014). Strategic governance, on the other hand, reflects the metaphor of the triple helix (Etzkowitz & Leydesdorff, 1995) in its constitution. Even though overlapping efforts are not evident in practice, the framework strengthens the institutionalization of collaboration in the field.

The practices of configuration of trust system result in proposing and sustaining ecosystem rules and standards of conduct. In the case Tecnosinos, the most apparent set of rules concerns technological specialization. Here both internal and external actors have a clear understanding of what lines of technological development are conducted in the innovation ecosystem. These limits facilitate trades, as a company that develops technologies for industrial automation, for instance, may find competitors, business partners, researchers, and the concentrated consumer market in a single space.

Finally, the group of practices concerning cognitive coherence results in the promotion of mutual understanding in the ecosystem. At this point, the case Tecnosinos reflects the characteristics of a developing organizational field, where the cognitive distance of distinct groups is still quite present (Zietsma & Lawrence, 2010). The quest about proximity between mindsets from academia and industry is relevant in this case. On the one hand, the results indicate that companies and the university have a different perspective of outcomes from this collaboration. On the other hand, respondents realize that within Tecnosinos boundaries, this distance is smaller compared to the open market. The practices conducted mainly by the Portal de Inovação seem to lead to this result.

The enabler elements of collaboration are also complementary and recursive. The Portal de Inovação, as a connecting structure, is driven by the delimitation of the axes of technological specialization and the mutual understanding of the benefits of collaboration between academia and industry. In contrast, technological specialization rules influence decision making in Tecnosinos' strategic governance and facilitate mutual understanding of collaboration for technological development. Finally, the mutual understanding about the interaction academia/industry influences the decision about the technological specialization of the field, since the industry, through direct contact with the consumer market, informs about technological development needs from the market point of view, while academy reports on scientific advances in specific fields of knowledge.

6 COMPARATIVE CASE ANALYSIS

The cases of Sophia Antipolis and Tecnosinos highlight practices of institutional work capable of developing structures, rules, and understandings as institutional logics (Thornton & Ocasio, 2008) analogous to the organizational field (Mazza & Pedersen, 2004) as enablers of collaboration in innovation ecosystems. The similarity between the cases is evident; however, particularities make these cases unique. For instance, the complexity of the institutional network that maintains governance in the Sophia Antipolis ecosystem and the university's centrality in the Tecnosinos ecosystem reinforces the discourse on unique characteristics in each case.

Although the three sets of practices predicted in literature - *i.e.,* social structuring, trust system configuration, and cognitive coherence – are observable in both cases, the shape of the actions is distinct. Only two practices are engaged in the same way in both cases. The practice of *governing*, for instance, portrays that in both cases, the actors seek to make decisions related to the strategic directions of the environment into a collegiate group. The second example is the practice of *holding events*. In both cases, events are periodically organized and held in the field to disseminate knowledge and reinforce a culture of innovation and collaboration in the ecosystem. All other empirically identified practices have context particularities.

Among similarities, the role of relationships in both contexts is highlighted. Although actors implement practices individually, they hold relational assets to ensure access and capillarity in the organizational field. These assets represent the connection with external branches or networks, collective decision-making schemes, and the flow of individuals through organizational structures. Evidence of these assets is reported in subsequent sections.

6.1 Relational asset of external connections

Legitimacy is a fundamental characteristic in the implementation of institutional work practices (Binz et al., 2016; Maguire, Hardy & Lawrence, 2004). The evidence collected in both cases analyzed points to the use of connections with actors outside the innovation ecosystem to build internal legitimacy. The bridge between different institutional contexts also highlights the support of the search for legitimacy in

institutional distance (Koskova et al., 2009). The effectiveness of institutional work practices is enhanced by the employment of these connections as relational assets.

The data analyzed point to operating dynamics of at least four networks of actors outside the field. These networks are built from public policies at the national and regional levels, or by the proximity of strategic objectives between national or international innovation environments.

The first dynamic concerns the group of accelerators installed in the ecosystem Sophia Antipolis. The ecosystem hosts at least three accelerators; however, the accelerator Village by CA is highlighted for its role in holding the continuity of the speech about the *chaîne de l'innovation*. As a recall, the *chaîne de l'innovation* is one of the pillars of mutual understanding in Sophia Antipolis.

The accelerator Village by CA is linked to the financial institution Crédit Agricole, a French-based financial cooperative with international operations. The representative of an accelerator tells: "Village by CA started five years ago in Paris [...] Today there are already about thirty. [...] In Sophia, there are twenty-three hosted companies, but it could reach thirty next year." (Interviewee – SA06). Figure 17 depicts the network of the accelerator Village by CA across French territory. This structure, with connections in other regions of the country, allows the accelerator to assume a prominent position in the context of Sophia Antipolis. A representative from an incubator reckons: "in the last stage of the *chaîne de l'innovation*, the startup can be settled in an accelerator; here we have Village by CA as a good example, where the entrepreneur will test and directly access the consumer market" (Interviewee – SA19).

Figure 17 - Village by CA network

Source: https://levillagebyca.com/fr/le-reseau
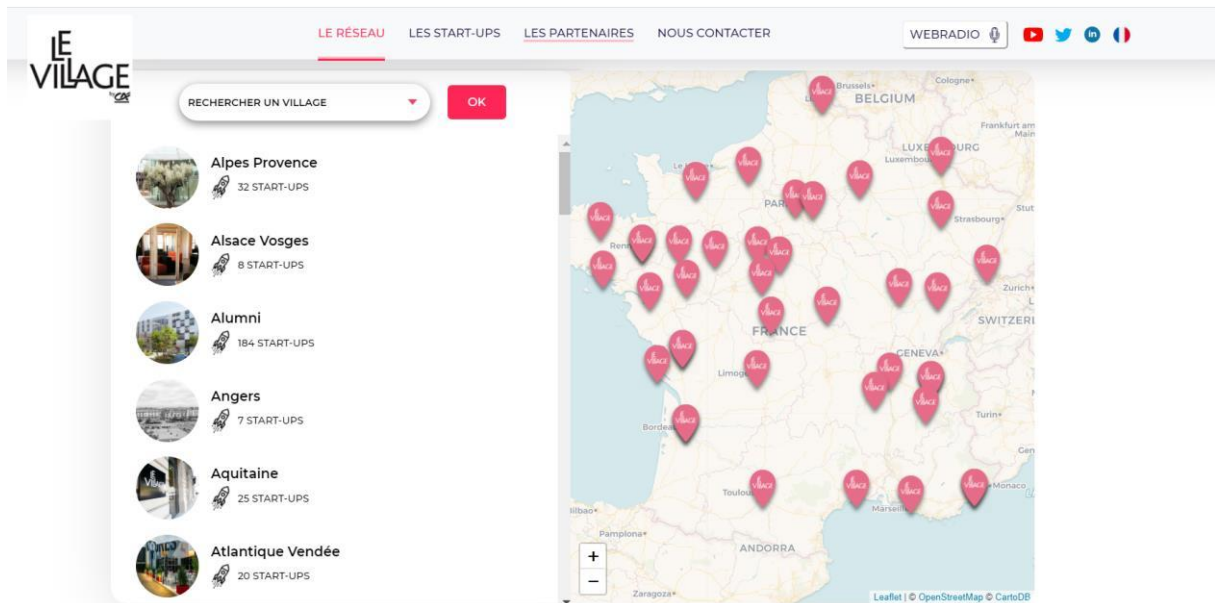
The actor uses the national network to enhance its attractiveness in the field and, consequently, expand its power of action. The representative of an accelerator tells: "the accelerator uses its national network to allow participating companies to access national financing or bank-related experts in other regions" (Interviewee – SA06). The accelerator's main lines of action in the ecosystem are linked to access to risk investment and prototyping access to the consumer market. In both cases, the external network is relevant, given that the accelerator becomes a guarantor of the startup's business model and allows access to investors and specialists in other regions of the country. According to a representative of an incubator, "startups seek the accelerator for the knowledge and market access it provides through the Crédit Agricole network" (Interviewee – SA19).

The second dynamic brings the use of national and international associations of parks and innovation environments to build legitimacy within the field and implement the institutional work practices of social structuring. It is noteworthy that both innovation ecosystems are linked to the IASP - International Association of Science Parks and Areas of Innovation. Actors use this link with associations to strengthen internal connection structures (Song, 2016) and seek political support to sustain the attractiveness of companies that ensure innovative diversity in the ecosystem (Hwang & Horowitt, 2012).

Organizational actors use regional associations to bring to the political discussion an agenda of demands of the innovation ecosystem. REGINP, a regional network of innovation environments to which Tecnosinos is linked, is organized as a "forum for discussion and exchange of good practices between innovation environments in Rio Grande do Sul" (Interviewee – TS12). University-linked technicians point out that "although initial, REGINP's association movement can serve as a channel to influence government policies for technology parks in our state" (Interviewee – TS02).

The actors use international associations as an instrument of internal and external legitimacy of the innovation ecosystem. A director of the university explains that: "Tecnosinos today is a park linked to IASP [...] it is recognized in Brazil as one of the most important technology parks" (Interviewee – TS02). "International associations form a showcase for Sophia Antipolis. We participated in the founding of several associations; IASP is one of them" (Interviewee – SA08). This way, *building public policies* and *governing* practices are enhanced by the legitimacy of the actors who might build and maintain social structures – *i.e.,* Portal de Inovação, Business Pôle, and Sophia Tech.

The third dynamic of external networks portrays the French Tech network as a national public policy that spans the boundaries of innovation ecosystems. The French Tech policy "is a national movement created in 2014 by the government of the time [...] its goal was to shed light and bring French innovation to the market in the country and abroad. Then, several French Tech metropolises were created" (Interviewee – SA07). Sophia Antipolis was one of thirteen territories directly impacted by this public policy, with the establishment of a physical office at the Business Pôle. Figure 18 depicts the distribution of French Tech metropolises in French territory.

Figure 18 - French Tech network
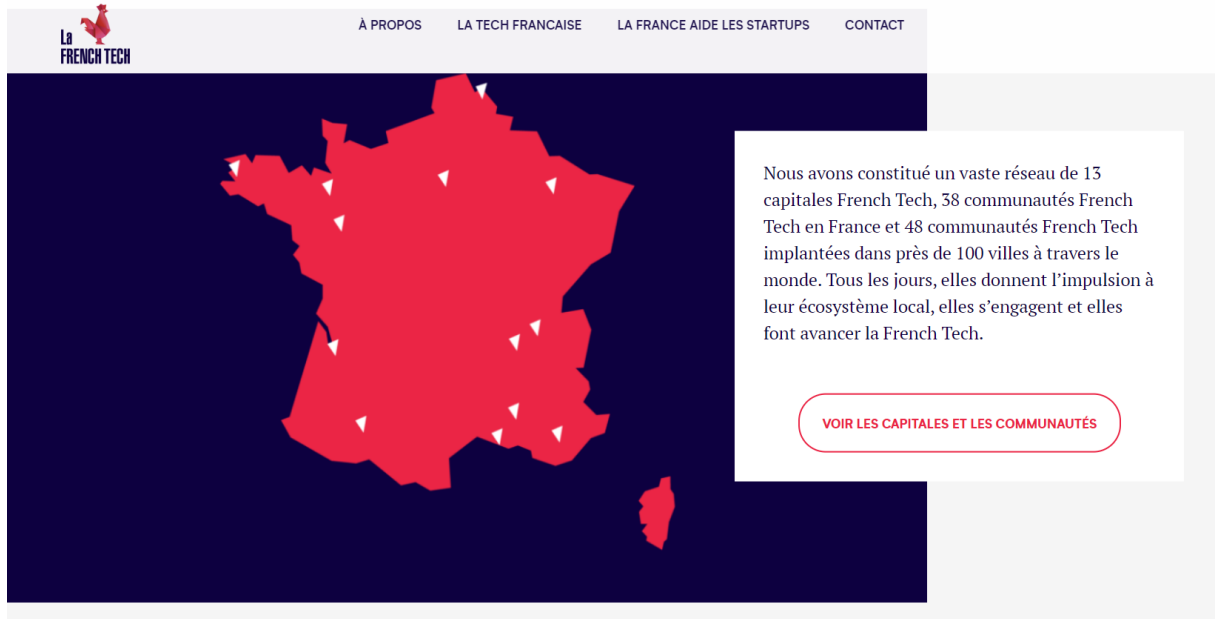
The use of the *metropolises* French Tech network throughout the French territory is an argument of legitimacy in the search for influence on the Sophia Antipolis ecosystem. A representative from a development agency explains: "companies that join French Tech end up joining a community that is visible in France and abroad, visible in French Tech Salons, French Tech Pavilions" (Interviewee – SA14). This public policy foresees the holding of national fairs and the support for participation in international events for those startups that join the program. This way, French Tech Côte d'Azur eventually becomes a portal of visibility and access to the market for Sophia Antipolis ecosystem startups.

In addition to the communication and marketing objectives already foreseen in the French Techs constitution, in Sophia Antipolis, the French Tech also holds the goal of "federating associations and actors already settled in the field to facilitate the access of services offered in Sophia for entrepreneurs" (Interviewee – SA07). The actor seeks legitimacy and representativeness through the national network of actors to implement these actions, proposed as an institutional work practice of *federating*. The result of this practice is the maintenance of the social structure in a cohesive and active platform in the innovation ecosystem – *i.e.,* Business Pôle.

The fourth network dynamics identified brings another public policy at the national level and its deployment in regional actions. *Pôles de competitivité* are claimed

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to defining collaboration rules in the Sophia Antipolis ecosystem through collective projects. It is noteworthy that collaboration does not occur exclusively within the collective projects of the SCS and Eurobiomed poles, but it is this model that highlights the impact of the set of rules on the effectiveness of collaboration for the development of technological innovation.

Pôles de competitivité have geographical boundaries – more extensive than the boundaries of innovation ecosystems – and boundaries set by technological development markets. The *pôle* Eurobiomed operates in the Provence-Alpes-Côte d'Azur and Occitanie regions through companies focused on the development of health technologies. The SCS hub operates in the Provence-Alpes-Côte d'Azur region through companies focused on the development of communication technologies. By having a broader geographical delimitation, the *pôles de competitivité* bridge the gap between interregional and intraregional innovation environments. Similar to other models of external networks that cross the boundaries of the innovation ecosystem, the *pôles de competitivité* increase legitimacy and influence over the strategic drivers of the innovation ecosystem.

In addition to connecting poles from other regions of the country, the public policy boundaries reinforce and validate the implementation of rules for collaboration in the innovation ecosystem. According to a representative from a development agency, "we have the job of networking actors where we will allow, for example, industrial actors to work with academic actors through collective projects" (Interviewee – SA01). For projects to be implemented, especially with the investment of monetary resources, the rules must be respected. A representative of a development agency brings: "we support the search for investment by applying to regional, national or European projects, where our adherents must respect the partnership models and project construction" (Interviewee – SA02). The actor justifies the use of rules to make viable exchanges between actors internal to the field and actors linked to other *pôles de competitivité* throughout the country.

This set of evidence brought by observations in both cases supports proposition 4 of this dissertation.

Proposition 4 - *Connections with external actors (national / international associations; public policies at national level, networks at national level) ease institutional work*

practices to impact on dimensions of institutional logics of collaboration in innovation ecosystems

External connections, therefore, is the first relational asset that eases the implementation of practices in all three sets of practices of institutional work predicted in literature. Actors use national and international associations to leverage the results of social structuring practices (Lawrence & Suddaby, 2006; Empson, Cleaver & Allen, 2013). National public policies deployed in regional agencies facilitate the implementation of trust-building practices (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010). Finally, nationwide networks help reinforce rhetoric and symbology as a result of cognitive cohesion practices. (Lawrence & Suddaby, 2006; Topal, 2015). In establishing external connections, actors use institutional distance in their favor (Koskova et al., 2019), since they use external legitimacy to justify and gain notoriety about their institutional work practices implemented internally in the organizational field. Table 18 summarizes the evidence collected in the field.

Table 18 - Relational asset of connections with external actors

Relational asset	Dynamics	Excerpt
External connections	Village by CA network	"Village by CA started five years ago in Paris [...] Today there are already about thirty. [...] In Sophia, there are twenty-three hosted companies, but it could reach thirty next year." (Interviewee – SA06). "The accelerator uses its national network to allow participating companies to access national financing or bank-related experts in other regions" (Interviewee – SA06). "Startups seek the accelerator for the knowledge and market access it provides through the Crédit Agricole network" (Interviewee – SA19)
	French Tech network	"The French Tech is a national movement created in 2014 by the government of the time [...] its goal was to shed light and bring French innovation to the market in the country and abroad. Then, several French Tech metropolises were created" (Interviewee – SA07) "Companies that join French Tech end up joining a community that is visible in France and abroad, visible in French Tech Salons, French Tech Pavilions" (Interviewee – SA14).
	Pôles de competitivité network	"We have the job of networking actors where we will allow, for example, industrial actors to work with academic actors through collective projects" (Interviewee – SA01). "We support the search for investment by applying to regional, national or European projects, where our adherents must respect the partnership models and project construction" (Interviewee – SA02)
	Associations of technology parks and innovation environments	"International associations form a showcase for Sophia Antipolis. We participated in the founding of several associations; IASP is one of them" (Interviewee – SA08). "Tecnosinos today is a park linked to IASP [...] it is recognized in Brazil as one of the most important technology parks" (Interviewee – TS02) "Although initial, Reginp's association movement can serve as a channel to influence government policies for technology parks in our state" (Interviewee - TS02).

Source: elaborated by the author.

In addition to the relational asset of connecting external actors, a second asset is identified from observations of both innovation ecosystems. The existence of decision-making schemes depicts a way to align objectives in the field and to join forces to implement the necessary practices to institutionalize collaboration in the innovation ecosystem.

6.2 Relational asset of collective decision-making schemes

The search for coordination between organizational actors leads to the definition of governance structures (Provan & Kenis, 2008). Literature sees the schemes that regulate collective decision-making as inducers of institutional environments that ease the innovation process (Berthinier-Poncet, 2014). Both cases of innovation ecosystems, Sophia Antipolis and Tecnosinos, bring evidence of collective decision-making schemes.

Although the complexity of governance differs between Sophia Antipolis and Tecnosinos, collective decision-making schemes perform similar functions in the field. At least 16 actors participate directly in the strategic decisions of the ecosystem Sophia Antipolis as participants of the SYMISA committee. As reported in an interview, "as more actors came, more governance came in" (Interviewee – SA08). On the other hand, the committee for strategic governance in Tecnosinos hosts four actors representing the university, the city hall, and industry associations. In any case, these schemes are responsible for sustaining ecosystem connecting structures, defining and legitimizing strategic guidelines, and reflecting cultural patterns in the field.

The SYMISA committee stands as the governance in Sophia Antipolis as an associative structure capable of bringing together public and private entities representing cities, universities, research laboratories, class associations, as well as entities responsible for encouraging entrepreneurship. SYMISA is based on a legal provision that allows the regulation of intercommunal decisions in French territory (Article L5216-1 of the General Code of Territorial Activities). The decision-making scheme is regulated by the formation of a committee to "ensure that all actors responsible for the dynamics of technopole's operation might be represented" (Interviewee – SA16).

The actors rely on the collective decision-making scheme to implement their objectives in the field. The director of an incubator says: "we rely on a partner network in Sophia Antipolis to support entrepreneurs in their development process" (Interviewee – SA09). The search for partners in the implementation of institutional practices reflects the reinforcement of agency distribution in the organizational field (Empson, Cleaver & Allen, 2013). In addition to the development of entrepreneurship, actors who seek to encourage collaboration between academia and industry, or collaboration between large and small companies, reinforce the discourse on the use

of collective decision-making schemes. The representative of an accelerator stands: "we seek to structure our team of experts by being close to business associations in Sophia Antipolis" (Interviewee – SA06).

The SYMISA committee also responds to the role of validating the infrastructure and investment actions in the ecosystem Sophia Antipolis. Through periodic meetings, the actors "handle the roads, the lighting, the mail, the administrative issues" (Interviewee – SA08). These actions impact on ecosystem connection structures, as the Business Pôle and Sophia Tech as ecosystem platforms (Autio & Thomas, 2014) are impacted by infrastructure maintenance.

Organizational actors use the collective decision-making scheme to legitimize their actions. "[…] If at the partner level there are ideas that stand out, things can go back up, and we try to work together and have meetings around the table with the people concerned, to make the decisions on it" (Interviewee – SA14). Primary decisions, such as the application to national programs, are brought to the committee to seek cohesion among stakeholders. The interviewee reports on the committee's role in building projects submitted to the central government. The claim foresees funding aimed at building Artificial Intelligence laboratories in Sophia Antipolis. A representative of the governance body stands that: "the committee is a place where everyone in the technopole is meeting and gathering, so we discussed the Trois I.A in the committee. It's not like deciding, it's more like talking. Like legitimizing." (Interviewee – SA16). Thus, the committee acts as a bridge between institutional work practices and the construction of infrastructure capable of connecting actors around technological development.

Organizational actors also use collective decision-making schemes to reproduce cultural patterns of the field. A representative of a development agency highlights that "all the municipalities are represented around the table as well as the chamber of commerce and industry, the prefecture and the universities precisely to meet this fertilisation croisée" (interviewee – SA14). *Fertilisation croisée* is impacted by the institutional work practice of *creating myths and symbols*, as well as *educating actors* and *holding field configuring events*. Actors use the decision-making scheme to reproduce the patterns of *fetilisation croisée* and thus reinforce the perpetuity of this behavioral pattern in the field.

Organizational actors use governance as a collective decision-making scheme to build and validate strategic guidelines in the field. The Sophia Antipolis case

highlights practices of institutional work of *defining strategic drivers* for building connectors among organizational actors in the innovation ecosystem. For the alignment between different visions and goals, decision-making schemes must be effective (Berthinier-Poncet, 2014). A representative from the governance body stands that: "if you listen to one entity, they are going to tell you 'well, the future is this', another one will tell you 'It's me, the future is this'. So, you got to have a body to say, 'Okay, let's analyze this together'". (Interviewee – SA08). This way, decision-making schemes act as a model for joint analysis of future strategic possibilities.

In the Tecnosinos case, the strategic governance of the ecosystem is reached through a collective decision-making scheme analogous to the triple helix model (Etzkowitz & Leydesdorff, 1995). According to a director from the university, "in strategic terms, governance takes place in a triple helix, with the participation of business associations, São Leopoldo City Hall and the university" (Interviewee – TS02). It is noteworthy that the strategic governance structure in Tecnosinos does not display the overlap of actions and resources between the three helixes as proposed by the literature (Etzkowitz & Leydesdorff, 1995). Still, the triple helix is brought as a metaphor in 11 of the 18 interviews conducted to elucidate the governance dynamics of Tecnosinos. Figure 19 shows the representation of the metaphor used in Tecnosinos digital advertising material.

Figure 19 - Governance of Tecnosinos

Source: https://www.tecnosinos.com.br/governanca/
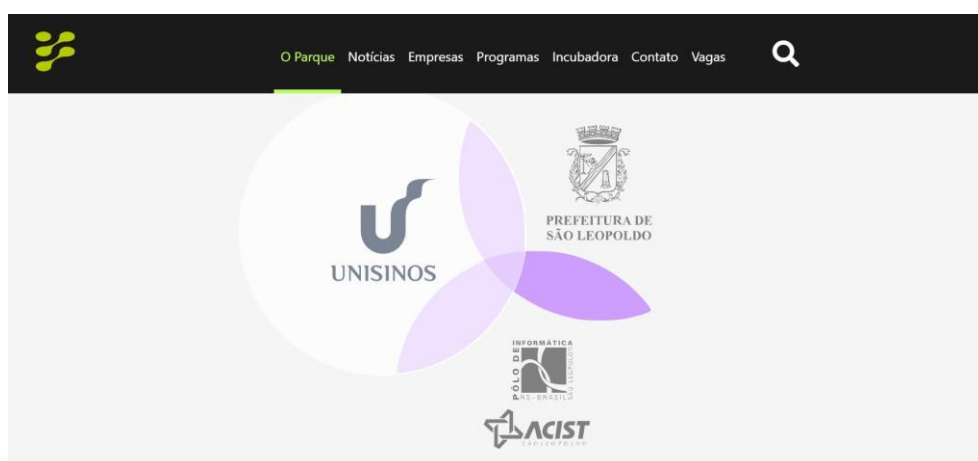
The ecosystem Tecnosinos similarly reflects the appreciation of governance as a space for a joint definition of strategic drivers of the ecosystem. It is worth mentioning

that in this case, the strategic drivers act as axes of action and impact the technological specialization as a set of rules that seek to build trust in the ecosystem. According to a professor, "defining the technological axes is a governance decision, in the main aspects" (Interviewee – TS01). However, these drivers are mainly based on proposals by UNISINOS, "in accordance with the educational direction it [university] wants to give to promote the employability of its graduates" (Interviewee – TS02). Thus, the strategic governance of the ecosystem assumes the primary role of locus of validation and legitimacy of the guidelines proposed by the university.

The university is responsible for the executive management of the innovation ecosystem Tecnosinos. A director from the university stands: "the park's strategic governance delegates the executive function to UNISINOS. This is a very relevant remark about Tecnosinos." (Interviewee – TS08). Thus, UNISINOS, as the actor responsible for implementing most of the institutional work practices observed in the case, is subordinated to the collective decision-making scheme. Another director sustains that: "the ecosystem management is directly influenced by strategic governance" (Interviewee – TS02).

Four actors establish the strategic governance of Tecnosinos – *i.e.* UNISINOS, São Leopoldo City Hall, ACIST-SL and the Associação do Polo de Informática. Compared to the SYMISA committee, the complexity of relationships for building cohesive decision-making is reduced. With this, there is a clear definition between the role of strategic governance and the park's executive management body. According to a director from the university, "management is traditionally from the university, but for strategic decisions to be implemented, a consensus between the four is required" (Interviewee – TS08).

Organizational actors also apply the collective decision-making schemes to moderate actions in a territory where ownership is shared. In Sophia Antipolis, complexity brings the dynamics sharing the territorial space among five cities. "This is why the governance was created, to have everyone around the table, representatives of each territory in the spirit of *fertilisation croisée*" (Interviewee – SA14). Moreover, within the Tecnosinos territorial space, there are lots owned by the university, city hall, state government and private companies. This complexity means that "every movement of expansion of the territory, with the construction of new real estate developments, passes through strategic governance" (Interviewee – TS02).

This set of evidence brought by observations in both cases supports proposition 5 of this dissertation.

Proposition 5 – *Collective decision-making schemes ease institutional work practices to impact on dimensions of institutional logics of collaboration in innovation ecosystems.*

Decision-making schemes thus, shape the second relational asset that eases the implementation of all three sets of institutional work practices. Practices of *governing*, common to both cases, are carried out through decision-making structures and impact definitions of ecosystem infrastructure investment. All three observed connection structures in the field – *i.e.*, Business Pôle, Sophia Tech, and Portal de Inovação – are the result of validated strategies within collective decision-making schemes. Also, collective decision-making schemes validate the strategic axes that impact on connection structures (Autio & Thomas, 2014) and set of rules for building trust systems (Hwang & Horowitt, 2012). Governance structures also reproduce behavioral patterns observed in the field and reinforce the construction of cognitive cohesion in innovation ecosystems (Hwang & Horowitt, 2012). Table 19 summarizes the evidence collected in the field.

Table 19 - Relational asset of collective decision-making schemes

Relational asset	Dynamics	Excerpt
Decision-making schemes	SYMISA committee	"We rely on a partner network in Sophia Antipolis to support entrepreneurs in their development process where we could intervene at any moment and give them good advices" (Interviewee – SA09) "All the municipalities are represented around the table as well as the chamber of commerce and industry, the prefecture and the universities precisely to meet this fertilisation croisée" (interviewee – SA14). "If you listen to one entity, they are going to tell you 'well, the future is this', another one will tell you 'It's me, the future is this'. So, you got to have a body to say, 'Okay, let's analyze this together'". (Interviewee – SA08).
	Tecnosinos strategic governance	"Tecnosinos is a technology park that has a triple helix standard, in Brazil, there are few, I think it may be a unique case, where there is a participation of the city hall of São Leopoldo, UNISINOS and associated entrepreneurs" (Interviewee – SA01). "Defining the technological axes is a governance decision, in the main aspects" (Interviewee - TS01). "The park's strategic governance delegates the executive function to UNISINOS. This is a very relevant remark about Tecnosinos." (Interviewee – TS08). "Management is traditionally from the university, but for strategic decisions to be implemented, a consensus between the four is required" (Interviewee – TS08).

Source: elaborated by the author.

In addition to the relational asset of collective decision-making schemes, a third asset is identified from observations of both innovation ecosystems. Individuals transit between the organizational structures of the innovation ecosystem and thus might take cognitive and action patterns between one structure to another. Evidence indicates that these relationships between individuals ease the implementation of practices to institutionalize collaboration in innovation ecosystems.

6.3 Relational asset of the flow of individuals through organizational structures

The innovation ecosystem is made up of organizational structures traditionally studied in the innovation literature, such as government, universities, research laboratories, large corporations, and startups (Etzkowitz & Leydesdorff, 1995;

Dahlman, Ross-Larson & Westphal, 1987). However, human capital present in the environment is responsible for the flow of knowledge and technological development within the boundaries of the innovation ecosystem (Song, 2016; Adner and Kapoor, 2010). Thus, the flow of individuals between the organizational structures of the field shapes a channel of institutionalization in the innovation ecosystem. Evidence from both cases analyzed corroborates this statement.

Before reporting the evidence collected in the field, it is worth mentioning the understanding of practices and actors according to institutional work (Lawrence & Suddaby, 2006). Organizational fields are underpinned by a set of practices that lead to the creation, maintenance, or disruption of institutions (Lawrence, Suddaby & Leca, 2009). The process of institutionalization is told through these practices and their effects on institutional logics (Thornton & Ocasio, 2008). However, practices do not occur spontaneously. They are products of the action endowed with intentionality and effort brought by individual or collective actors (Lawrence, Suddaby & Leca, 2009).

The research identified a set of 21 practices conducted by collective actors with academic, business, and institutional profiles in both cases analyzed. However, the flow of individuals between the organizational structures of these actors becomes relevant as it might tacitly transmit cultural patterns propagated through institutional work practices. Three interaction dynamics – *i.e.,* academia/industry; among large companies; large companies/startups – evince the catalyst effect of the flow of individuals through organizational structures in the innovation ecosystem.

The first dynamic depicts the flow of individuals between academic and industrial structures. In Sophia Antipolis, public research laboratories and centers – *i.e.,* INRIA, INRA, CNRS – produce research and development of new technologies focused on the strategic axes of the innovation ecosystem. The alignment of research structures to innovation axes allows researchers to develop knowledge in line with the market needs of the industry settled in the environment. As a result, the flow of individuals is observed between the structures of the research laboratories and the large companies settled there. A director from a development agency stands: "there are often people who worked in research labs and move on to companies and then take this connection with the labs. This allows partnerships to be created." (Interviewee – SA03). The flow enables the collaboration standards of laboratories and research centers to be adequately understood by industry.

Sharing cultural and cognitive patterns also benefits from the flow of individuals between academic and industrial structures. In Tecnosinos, the practice of *highlighting mutual gain* depicts as a way to build the alignment of vision between academia and industry. The organizational actor Portal de Inovação seeks to build its technical team by hiring individuals who have had work experiences in industries. A director from the university recognizes: "we seek to hire people who have had industry experience, as we believe that living there facilitates understanding about the advantages of academia/industry interaction" (Interviewee – TS08). Thus, individuals carry with them an understanding of different perspectives on interaction.

The flow of individuals who continuously move across educational and business structures is another relevant feature in the innovation ecosystems. Tecnosinos draws on the proximity of technology companies to engineering and technology schools. UNISINOS, as the only university physically settled within the limits of the ecosystem Tecnosinos, seeks to guide the training of professionals according to the demand of the companies settled there. A director from the university reckons: "our main challenge is to provide qualified labor to fill constantly open vacancies at Tecnosinos" (Interviewee – TS02). Also, companies rely on a relevant part of their staff as university students. The director of a mature company set in Tecnosinos assumes: "we also provide students for UNISINOS; we have between thirty-five and forty percent of our workforce as university students" (Interviewee – TS07). This proximity seeks to allow problems of the field that might be taken to the classroom and eventually might be treated through scientific research.

A second dynamics of the flow of individuals is observed between the structures of large companies. The example of absorbing labor force within the ecosystem boundaries from companies that, for any reason, decide to leave the ecosystem into new companies that settle their operations in the ecosystem is relevant. According to the director of an entrepreneurial association, "Texas Instruments, for instance, shut down its operations in Sophia in one day. Within two weeks, all its 700 former employees were all relocated. Companies can create new opportunities, take advantage of the job offer you have here." (Interviewee – SA04). Then, individuals might transport cultural and cognitive patterns from one organizational structure to another. The labor market constantly feeds through technological transition movements. "What happened to Texas Instruments is cyclical, some companies strategically understand that the place is no longer attractive, while others experience

market opportunities coming to Sophia Antipolis" (Interviewee – SA04). This movement stimulates the flow of individuals between large companies while maintaining active symbolic standards such as *fertilisation criosée*.

Choosing to hire individuals who share the cultural and cognitive patterns of the field also reinforces the flow of individuals between organizational structures as a relational asset. In the case of Tecnosinos, it is also relevant the exchange of professionals between companies. According to a representative from a development agency, "there is an interesting flow of talent among the companies here at Tecnosinos. There are constantly open vacancies, and this encourages technicians to switch companies." (Interviewee – TS01). Although this flow is seen not only on its positive side, as "a competitive market for talent in Tecnosinos has been created" (Interviewee – TS04), the flow of individuals reinforces the development of shared understandings in the field. "Whenever we can, we hire people who have worked here at Tecnosinos. Not for the sake of competition – because we have no direct competitor here – but because this professional already knows the park, the culture of innovation." (Interviewee – TS07).

The flow of individuals is also reflected in the social structuring of the innovation ecosystem. Through knowledge acquired by the flow between organizational structures inside the ecosystem, individuals develop the ability to propose connections in the field. A representative from a development agency recognizes: "I consider myself a networking man. My experience in Sophia Antipolis accredits me in helping startups and large companies to match technology offer and demand." (Interviewee – SA04). This capability reflects the effectiveness of institutional work practices of *chaining* and *federating* that result in the structuring of platforms such as the Business Pôle in Sophia Antipolis.

The third dynamic of the flow of individuals occurs through structures of large companies and startups. A relevant movement is observed in Sophia Antipolis. The representative of an entrepreneurial association stands: "large companies encourage their employees to create startups to develop technological solutions that might enhance their processes" (Interviewee – SA04). This movement reflects a way to outsource the risk of innovating and entrepreneurship. The technical alignment between individuals and organizational structures eases the creation and development of startups.

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Connecting startups with the market is a significant challenge in the Sophia Antipolis case. The representative from an entrepreneurial association reckons: "Sophia is a research and development hub, not necessarily a business hub. Entrepreneurs are not really entrepreneurs, they have a very good idea, they can develop very good ideas, but they can't sell it." (Interviewee – SA04). However, startups made up of entrepreneurs who already had technical expertise shared with organizational structures of large companies may connect markets and ensure the perpetuity of collaboration. "There are several startups here in the park that were founded by former employees of Amadeus, SAP, Thalles, etc. and today they are suppliers of these same companies" (Interviewee – SA14).

This evidence of the flow of individuals through the organizational structures of innovation ecosystems supports proposition 6.

Proposition 6 – *The flow of individuals through organizational structures ease institutional work practices to impact on dimensions of institutional logics of collaboration in innovation ecosystems.*

The flow of individuals through organizational structures, therefore, portrays the third relational asset that eases the implementation of institutional work practices. Practices of *chaining* and *governing* that lead to the construction of ecosystem connection structures (Autio & Thomas, 2014) are enhanced by the flow of individuals between organizations – *i.e.,* individuals' experience and networking may lead to the effectiveness of the Business Pôle and Sophia Tech. The flow of individuals through academic and industry structures connects the practice of *bounding axes of action* with the outcomes of technological specialization. Also, the flow of individuals eases the propagation of myths and symbols – *i.e.,* reinforcement of the discourse on *fertilisation croisée* in Sophia Antipolis – for the construction of cognitive cohesion (Hwang & Horowitt, 2012). Table 20 summarizes the evidence collected in the field.

Table 20 - Relational asset of the flow of individuals through organizational structures

Relational asset	Dynamics	Excerpt
The flow of individuals between organizational structures	Academia/ industry	"There are often people who worked in research labs and move on to companies and then take this connection with the labs. This allows partnerships to be created." (Interviewee – SA03). "We seek to hire people who have had industry experience, as we believe that living there facilitates understanding about the advantages of academia/industry interaction" (Interviewee – TS08). "We also provide students for UNISINOS, we have between thirty-five and forty percent of our workforce as university students" (Interviewee – TS07).
	Throughout large companies	"Texas Instruments, for instance, shut down its operations in Sophia in one day. Within two weeks, all its 700 former employees were all relocated. Companies can create new opportunities, take advantage of the job offer you have here." (Interviewee – SA04). "I consider myself a networking man. My experience in Sophia Antipolis accredits me in helping startups and large companies to match technology offer and demand." (Interviewee – SA04). "Whenever we can, we hire people who have worked here at Tecnosinos. Not for the sake of competition – because we have no direct competitor here – but because this professional already knows the park, the culture of innovation." (Interviewee – TS07).
	Large companies/ startups	"Here in Sophia, there is an interesting dynamic of startup creation. Large companies encourage their employees to create startups to develop technological solutions that might enhance their processes" (Interviewee – SA04). "There are several startups here in the park that were founded by former employees of Amadeus, SAP, Thalles, etc. and today they are suppliers of these same companies" (Interviewee – SA14).

Source: elaborated by the author.

The evidence points to the existence of three relational assets in the interrelationship between institutional work practices and the institutional logics of positions, rules, and understanding of the organizational field (Mazza & Pederson, 2004). From the joint analysis of the ecosystems Sophia Antipolis and Tecnosinos, this dissertation proposes a new theoretical-conceptual framework capable of replying to how institutional work practices foster collaboration in innovation ecosystems.

6.4 Proposition of a joint theoretical-conceptual framework

The cases of innovation ecosystems Sophia Antipolis and Tecnosinos point to a set of institutional work practices (Lawrence & Suddaby, 2006) that lead to the

construction of structural, normative and symbolic dimensions of institutional logics (Thornton & Ocasio, 2008) that support the institutionalization of collaboration inside the innovation ecosystem as an organizational field (Thomas & Autio, 2014; Mazza & Pedersen, 2004). The interaction between institutional work practices and logics is eased by the existence of relational assets that reflect connections with actors outside the ecosystem, collective decision-making schemes, and the flow of individuals through organizational structures of the ecosystem.

The analysis takes place on three levels. The organizational level allows observing the practices, given that collective actors are assigned with intentionality and effort to the agency for the creation, maintenance, or disrupture of institutions (Lawrence, Suddaby & Leca, 2009). The relational level allows the observation of relational assets, according to the distribution of agency among individual and collective actors (Empson, Cleaver & Allen, 2013). Finally, the field level allows the observation of institutional logics regarding positions, rules, and understandings (Mazza & Pedersen, 2004; Thornton & Ocasio, 2008).

The analysis of collaborative behavior as institutionalized patterns of action and cognition sets within the organizational field of the innovation ecosystem. As a contextualized explanation, this dissertation considers three elements to distinguish the innovation ecosystem as and organizational field (Thomas & Autio, 2014; Mazza & Pedersen, 2004): a) structures for governance and control; b) dynamics for technological development; and c) environment borders. The existence of platforms as structures for governance and control, the innovation as an open process, and the attachment of organizational actors to inner platforms characterize the innovation ecosystems Sophia Antipolis and Tecnosinos.

This research underscores the claim for working on the interplay between institutional work (Lawrence & Suddaby, 2006) and institutional logics (Thornton & Ocasio, 2008), through a *figure and ground* perspective (Zilber, 2013). The focus of the analysis is on the practices, with the institutional work as *figure*, however, without letting aside the institutional logic as *ground*. Relational assets are positioned between these two ends, and this dissertation sustains their role as facilitators. Figure 20 portrays the theoretical-conceptual framework of the dissertation after the joint analysis of the innovation ecosystem Sophia Antipolis and Tecnosinos.

Figure 20 - Theoretical-conceptual framework on institutional work practices to foster collaboration in innovation ecosystems
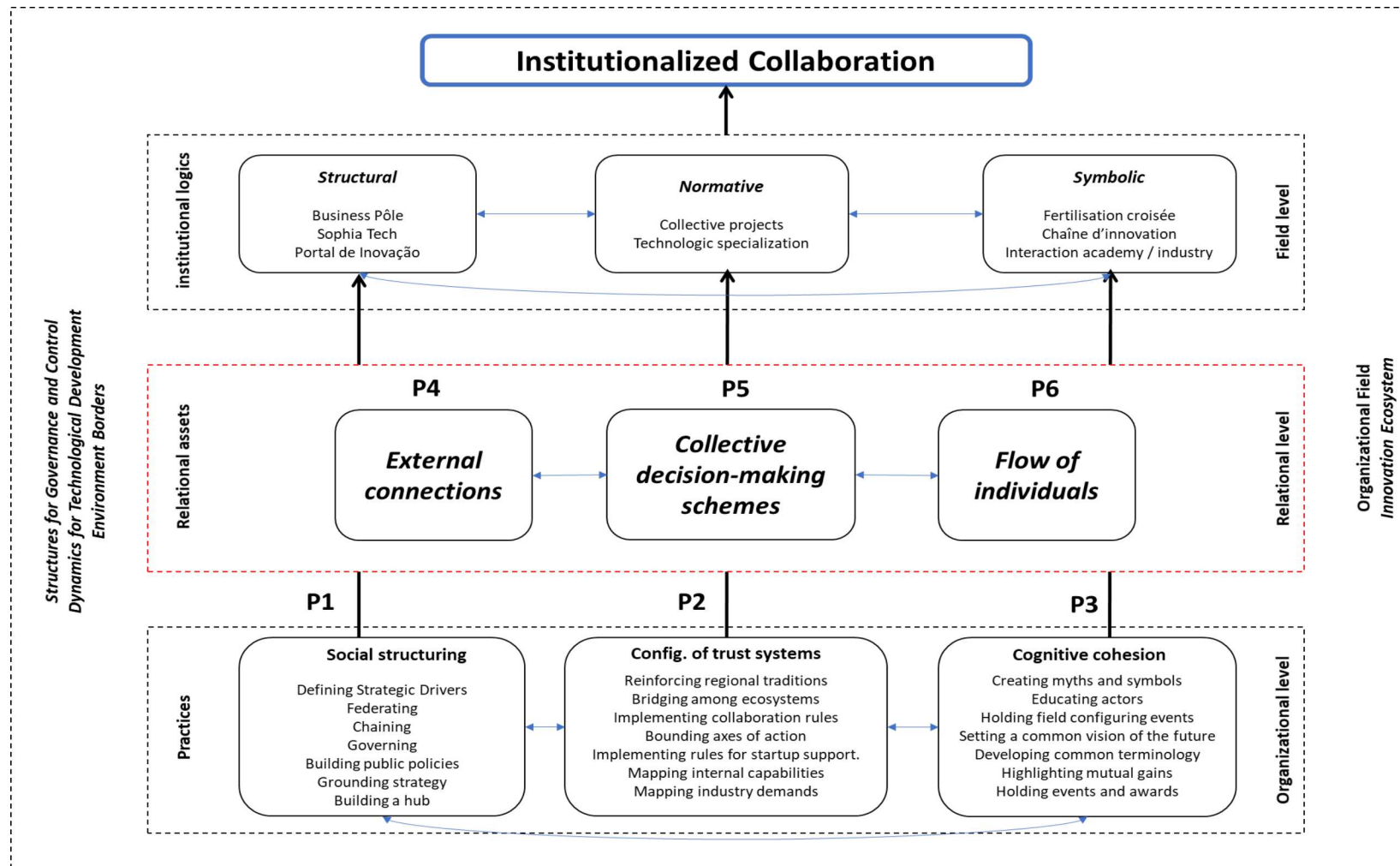
Source: elaborated by the author based on empirical observations and Lawrence and Suddaby, 2006; Empson, Cleaver and Allen, 2013; Thronton and Ocasio, 2008; Thomas & Autio, 2014.

The analyzed cases illustrate the practices with the potential to institutionalize collaboration in the ecosystem. Narratives that reflect the operating dynamics of the innovation ecosystem supported the identification of 21 institutional work practices. The practices were classified according to their potential impact on institutional logics. Institutional work practices of social structuring (Lawrence & Suddaby, 2006; Empson, Cleaver & Allen, 2013; Waldron et al. 2015) reflect the mobilization of political support, development of coalitions, leverage of public policies, and the pursuit of common goals that may influence the creation and maintenance of connection structures in the innovation ecosystem. The practices which are analogous to the institutional work of configuring trust systems (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010) highlight asset mapping and the definition of strategic drivers and acceptable cultural patterns that allow the construction of rules and norms for exchange in the innovation ecosystem. Finally, institutional work practices of cognitive cohesion (Lawrence & Suddaby, 2006; Topal, 2015) bring the use of myths, symbols, events, awards, and discourse that may lead to the construction of shared understanding about moral standards of the innovation ecosystem.

Practices do not occur in isolation. Institutional work highlights the need to understand the institutionalization process as an engendered set of practices (Lawrence, Suddaby & Leca, 2011). The evidence points to the complementarity and recursiveness of practices. The practices of *chaining – i.e.,* seeking to connect different actors on a common goal of tracking startups on their development trail – is complemented by the practices of *implementing collaboration rules – i.e.,* actors build and apply acceptable parameters for building collaboration – and *creating myths and symbols – i.e.,* discourse on *fertilisation croisée* supports the cohesion of the stakeholder group to accompany startups.

The cases also depict relational assets that will ease the implementation of institutional work practices. The interaction dynamics inside the field point to the existence of three relational assets. Organizational actors use external connections, either by subsidiaries or partner organizations in outer regions, to ensure legitimacy and recognition of their influence over the field. Collective decision-making schemes support in aligning actors within the organizational field. Actors use these schemes to build their support base as well as to develop the necessary cohesion to implement institutional work practices. Finally, the flow of individuals through the organizational structures of the field enables the transposition and exchange of cognitive and cultural

patterns in the innovation ecosystem. The three elements are proposed as assets according to their power of easing practices and their linkage to organizational structures. The propositions 4, 5 and 6 of this dissertation sustain the easing role of relational assets.

Among the three relational assets, the central role of collective decision-making schemes stands out. The interaction among collective decision-making schemes and the other two is recursive. Collective decision-making schemes will allow or restrict the participation of actors with connections outside the organizational field, while this participation indicates the porosity of field boundaries and openness to external influence on strategic decisions of the innovation ecosystem. On the other hand, decision-making schemes can limit or stimulate the flow of individuals across organizational structures through rules, while individuals with expertise and thorough knowledge of the ecosystem structures may influence the construction of this same decision-making schemes.

Empirical evidence points out that institutional work practices, eased by relational assets, will outcome in the construction of institutional logics. Three dimensions of complementary and necessary institutional logics underpin institutions: structural, normative, and symbolic (Thornton & Ocasio, 1999). Narratives reflect these dimensions in both cases of innovation ecosystems. Under the structural dimension, this research stands for the understanding that innovation ecosystems have their interaction dynamics based on connection structures, such as platforms (Autio & Thomas, 2014). Under the normative dimension, innovation ecosystems need rules and norms that can guarantee exchanges among academia, industry, and government (Hwang & Horowitt, 2012). Finally, symbology is understood in innovation ecosystems as a set of discourses, symbols, myths that guarantee mutual understanding among actors (Schwartz & Bar-El, 2015).

The three dimensions of institutional logics are observed in both cases of innovation ecosystems. Connection structures are observed from the infrastructure and operating dynamics of Business Pôle and Sophia Tech in Sophia Antipolis and the Portal de Inovação in Tecnosinos. Rules and norms for exchanges are reflected from the rules of collective projects in Sophia Antipolis and the technological specialization in Tecnosinos. Finally, the mutual understanding reflects the sustaining discourses of the *fertilisation croisée* and *chaîne de l'innovation* in Sophia Antipolis and the academy/industry interaction in Tecnosinos.

The structural, normative, and symbolic dimensions are complementary institutional logics based on the empirical observations of this research. The coexistence of the three dimensions is mutually reinforced. Connecting structures will only be used to foster collaboration when norms and rules that guarantee fair and mutually beneficial exchanges are observed. Nonetheless, when academic, business and governmental entities align their understanding of potential gains from collaboration, the connection structures are empowered.

Institutional logics allow the understanding of the institution's support dynamics (Zilber, 2013; Thornton & Ocasio, 2008). Thus, when the research identifies structures, norms, and symbols in complementarity, it may characterize the institution (Thornton & Ocasio, 1999). Recalling the institution as a set of elements of social life with the potential to shape beliefs and behaviors of individual and collective actors (Lawrence, Suddaby & Leca, 2011), it is possible to identify in both cases patterns that lead to the understanding of collaboration as an institution. The collective projects developed from the interaction between large companies, startups, and research laboratories within the *pôles de competitivité* shape evidence. Other examples include collaboration among large companies and startups for technology development in Sophia Antipolis or the partnership between the Technological Institute and HT Micron in Tecnosinos for the joint development of semiconductor technologies.

The evidence responds to the proposed problem by demonstrating how institutional work fosters collaboration in innovation ecosystems. This research sustains the thesis that *relational assets ease the implementation of institutional work practices that foster collaboration as an institutionalized organizational behavior inside innovation ecosystems*.

CONCLUDING REMARKS

Institutional work practices foster collaboration for technological development in innovation ecosystems. The dynamics of development and support of collaboration in the cases Sophia Antipolis and Tecnosinos support this statement. Institutional work (Lawrence & Suddaby, 2006) is articulated with the perspective of institutional logics (Thornton & Ocasio, 1999) to compose the theoretical framework that supports field analysis, leading to contributions to literature and practitioners. Nevertheless, concluding remarks are relevant.

Sophia Antipolis, as an innovation ecosystem, has been developing and transforming over the last five decades. Its trajectory led to the construction of complex governance structures. A new R&D-based economy has developed in a region traditionally recognized for tourism, culture, and entertainment. The proposal of an analysis of practices that lead to the institutionalization of collaboration in the field demonstrated a plurality of actors and actions.

Although recent, Tecnosinos' trajectory as an innovation ecosystem also portrays the economic reconversion of a region. In just over 20 years, Tecnosinos' innovation ecosystem has enabled the development of a new technology-based economy in a region recognized for low value-added industry and services. Under the perspective of institutionalization of collaboration, the data analyzed indicate that Tecnosinos is a maturing organizational field, with evidence of distinct institutional work practices.

The comparison between cases raises at least two discussions about innovation ecosystem models and their impact on institutional dynamics. The distribution of responsibility for maintaining the attractiveness of the ecosystem, as well as the balance between public and private entities, are illustrative of these discussions.

In terms of agency distribution, the cases are distinct. Sophia Antipolis, as a result of its developmental trajectory, hosts a complex network of organizational actors, At least 16 organizations actively participate in the construction of strategic ecosystem decisions. Whereas in Tecnosinos, the governance structure is mainly used to validate and align the strategies proposed by UNISINOS. Thus, actions with a direct impact on the institutionalization process are mostly conducted by the university in Tecnosinos, while there exists a plurality of actors conducting similar actions in Sophia Antipolis.

A second distinguishing feature between the cases is the balance in the participation of public and private actors. Sophia Antipolis is created as a technopole under a public policy framework. Thus, the participation of public entities in the economic life of the innovation ecosystem is evident throughout its trajectory. In the recent scenario, the presence of public entities is relevant in conducting institutional work practices. In contrast, the flow of private financial resources led to the development path of Tecnosinos. The university itself, a central actor in the ecosystem, is a private nonprofit entity. Public funding comes from financing infrastructure for expansion projects and occasionally subsidizing scientific research. Also, the results point to the inexistence of public entities physically settled in Tecnosinos. As a reflection, the prominent actors conducting institutional work practices are mostly private entities.

It is noteworthy that the analysis does not encompass this dichotomy between centrality/plurality in decision making and public/private resources in financing actions. However, the reader might be aware of these characteristics to understand the cases. Thus, the contributions to both literature and practitioners are set.

Contributions to literature

This dissertation articulates between perspectives of institutional theory based on the organizational bias (Selznick, 1948; DiMaggio & Powell, 1983). The perspective of institutional work is positioned as central to the analysis since the study sought to demonstrate how a set of practices leads to the institutionalization of collaboration in innovation ecosystems. Anyhow, the dissertation meets the invitation to integrate institutional work (Lawrence & Suddaby, 2006) and institutional logics (Thornton & Ocasio, 1999) in the same analysis (Zilber, 2013). In response to this call, the dissertation supports the application of an intermediate level of analysis – *i.e.,* relational level – that might translate the dynamics of practices endowed with intentionality, effort, and reflexivity (Lawrence, Suddaby & Leca, 2009) into structural, normative and symbolic dimensions of institutional logics (Thornton & Ocasio, 1999).

Inherent elements of relationships between organizational actors are proposed as relational assets that might ease the implementation of institutional work practices. Both Sophia Antipolis and Tecnosinos cases are pragmatic in demonstrating how actors use these assets to implement practices that lead to the institutionalization of

collaboration in innovation ecosystems. The connection with actors outside the field underscores the distribution and positioning of actors (Zietsma & Lawrence, 2010; Barin Cruz at al., 2016) as an asset for the development of internal legitimacy. Collective decision-making schemes highlight structures that support institutional work (Lawrence, Leca & Zilber, 2013) and become an asset as actors use these schemes to validate undertaken practices. In time, the flow of individuals across the organizational structures of the field underscores the characteristic of agency distribution (Empson, Cleaver & Allen, 2013) and becomes an asset for the spreadability and reproduction of institutional patterns within the field.

Thus, the contribution to the institutional theory is twofold. On the one hand, it informs the perspective of institutional work on relational elements with the potential to ease the effectiveness of practices in the field. It demonstrates that the inclusion of the relational perspective into the framework of institutional work practices helps to elucidate the microdynamics that leads to the institutionalization process (Hallett, 2010; Empson, Cleaver & Allen, 2013). On the other hand, this dissertation contributes to the discussion about the interplay between institutional work and logics (Zilber, 2013). By proposing the relational level as a mediator between the two ends of neo-institutionalist currents, this dissertation seeks to define elements that can translate the dynamics of institutional work into dimensions of institutional logic. The connection between institutional work and institutional logics responds to the provocation of aggregating both perspectives in a single analysis (Zilber, 2013).

In addition to contributions to institutional theory, this dissertation sought to contribute to the literature on innovation ecosystems. Although authors agree around the prominent role of free, purposeful, and recurring interactions on the development of innovation in ecosystems (Carayannis & Campbell, 2009; Song, 2016; Autio & Thomas, 2014), the dynamics of fostering collaboration within this same context still puzzles. The dissertation demonstrates how a set of actors might promote practices aimed at institutionalizing collaboration in the field.

The approach with the institutional perspective also allows dimensions of institutional logics to reflect pillars for supporting collaboration in the field. Thus, the literature on innovation ecosystems is informed about structures, rules, and symbology that lead to collaboration in the field. Table 21 summarizes the contributions of this dissertation to the literature.

Table 21 - Contributions to literature

Literature	Literature gap	Findings	Contribution
Institutional work	Need to include relational aspects as supporting structures for institutional work practices (Lawrence, Leca & Zilber, 2013)	Relational assets	Actors do not perform institutional work practices in isolation but rely on relational assets to ease the implementation of these actions.
Institutional work / Institutional logics	Need to place the boundaries between the perspectives of institutional work and institutional logics, while demarcating ways for discussion between both (Zilber, 2013)	Relational level of analysis	The relational level of analysis might portray a bridge between a deterministic perspective of the effects of structure and an unrestricted power perspective of the agency of individual or collective actors on these same structures.
Innovation ecosystems	The dynamics of collaboration development in innovation ecosystems need further analysis (Song, 2016; Autio & Thomas, 2014)	Institutional work practices	Institutional work practices demonstrate how collaboration is institutionalized in innovation ecosystems.
		Dimensions of Institutional logics	Dimensions of structure, regulation, and symbology of institutional logics underpin institutionalized collaboration in innovation ecosystems.

Source: elaborated by the author.

In addition to the contributions to the literature, the findings of this dissertation indicate managerial contributions.

Managerial contributions

This dissertation aims to demonstrate how institutional work practices foster collaboration in innovation ecosystems. Innovation environments - *i.e.,* technology parks, entrepreneurial ecosystems, regional innovation systems – has recently spread as a strategy driven by universities, research centers, public managers, or large corporations to attract innovative economic activity. The results of this research supply the public endowed with intentionality and effort to conduct actions that lead to the attractiveness of a locality. It is noteworthy that there is no pretense of making this research prescriptive, delivering a manual for building collaboration in innovation ecosystems to organizational actors. However, it is sought that this dissertation becomes a tool capable of subsidizing the decision-making process of these same

actors. For this, the framework of practices, relational assets and institutional dimensions emerges.

The practices of institutional work point that organizational actors may conduct actions aimed at building social structures for connection, delimiting norms and rules for exchanges, as well as promoting cognitive cohesion in the field. It is remarkable that these practices happen at the same time, sometimes competitively and sometimes complementary. Thus, this dissertation demonstrates that the organizational actor must not only define which practices will be conducted by it but identify those practices conducted by other actors in the field that may complement its efforts or mitigate its results.

The relational assets observed in the dissertation point to the need to identify characteristic elements of the innovation ecosystem that may promote the actor's internal legitimacy, cohesion in decision making, and the spreadability of cultural and cognitive patterns. By identifying assets that promote these elements, the practices managed by the organizational actor gain prominence and effectiveness in the field.

Finally, institutional dimensions inform actors about structures, norms, and symbology as support for collaboration in the innovation ecosystem. Organizational actors with the ability to identify these dimensions in the field may support their action by choosing to construct, reinforce, or reformulate these elements.

Thus, bringing the institutional perspective to the analysis of collaboration in innovation ecosystems is the main managerial contribution of this dissertation. However, there are specific recommendations for each of the analyzed cases.

Empirical data indicate that the main obstacle to collaboration for technological development in Tecnosinos resides in the cognitive distance between academia and industry. Interviews on both sides of the interplay point to the difficulty in developing common perspectives that can mediate collaboration. It is noteworthy that Tecnosinos presents characteristics of a maturing organizational field, precisely because of the distance between cultural patterns observed in academia and industry. The institutional dimension of symbology is the most fragile in the Tecnosinos case.

As a recommendation, organizational actors, especially UNISINOS, because of their central position in the field, might use relational assets to enhance cognitive cohesion practices and strengthen the other dimensions of ecosystem structure and rules. It is possible to intensify the flow between students and researchers through university structures and companies settled in the ecosystem. It is also recommended

to strengthen the governance of the ecosystem, opening for the active participation and not only validation of the public and business entities represented there. Overlapping functions according to the triple helix precepts is an alternative (Etzkowitz & Leydesdorff, 1995). In time, UNISINOS' external connections should translate into opportunities for entrepreneurs and researchers within the ecosystem.

Regarding institutional logics dimensions, the Portal de Inovação has the characteristics to become a hub between academia and industry (Autio & Thomas, 2014), and should eventually enhance R&D partnerships. Strategic specialization assists in defining which initiatives can be developed in the field, but a framework of rules that encourages collaboration between research institutes, large companies, and startups, such as the collective projects of the *pôles de competitivité*, may enhance the attractiveness of collaboration between academia and industry.

In Sophia Antipolis, the distance between entrepreneurial activity and the market makes the environment an R&D park, not an entrepreneurial one. The bloom of startups in Sophia Antipolis is centered on creating R&D outsourcing microsystems around large companies such as Amadeus. The outsourcing scheme makes it difficult for startups to interact because they are tied strictly to the structure of the large company.

As a recommendation, organizational actors responsible for the attractiveness and maintenance of the park – *i.e.,* actors integrating the comité du Symisa – may use relational assets as a connection channel between demand and supply of technological development. Sophia Antipolis is traditionally far from local demands for technological improvement. Cities surrounding the ecosystem benefit little from the technology developed there. Mission-oriented policies (Mazzucato, 2018) and connecting with communities surrounding Sophia Antipolis (Carayannis & Rakhmatullin, 2014) can be answers to the challenges of making Sophia Antipolis not just an R&D environment, but an entrepreneurial one.

Relational assets play an essential role in the endeavor of connecting community needs to research structures of Sophia Antipolis. The empirical observations of the dissertation argue that connections outside the field are naturally feeding channels of the ecosystem with external perceptions. As there is openness for external actors, such as community associations, to connect to the field, opportunities for technological development may appear. Also, decision-making schemes might validate and sustain mission-oriented innovation policies.

Research limitations

This dissertation proposes to answer how institutional work practices foster collaboration in innovation ecosystems. Through the analysis of the cases of Sophia Antipolis and Tecnosinos as an innovation ecosystem, it was possible to respond to the initial research problem by proposing a theoretical-conceptual framework (Figure 12). Notwithstanding, it is timely to note the limitations of the study and actions to mitigate its impact on dissertation results.

The articulation between French and Brazilian cases brings cultural and linguistic complexity as challenges to the accomplishment of a research that claims to be based on critical realism, where the context plays an essential role in the explanation of causality. The language barrier is the first limitation of this study. Semi-structured interviews were conducted in three languages - English, French, and Portuguese – according to the preference of the interviewees. Although the analysis conducted has focused on the content of interviews, specific terms of the mother language are relevant, especially from a theoretical perspective that values actions embedded in cultural and cognitive patterns (Lawrence & Suddaby, 2006). In response to this challenge, some terms have been preserved in their original language – *e.g., fertilisation croisée, portadores de future* – in order to preserve the sense of application in the field.

The geographical distance and the researcher's access to the field is another limiting factor of the research. For the Sophia Antipolis case, the researcher made two 15-days immersions respectively in September and December 2018. During this period, the researcher participated in public events conducted by organizational actors included in the analysis. Also, field notes were produced about the researcher's perceptions about the context in which the ecosystem is inserted. Nevertheless, to overcome the challenge of the short time for immersion in the field, at the end of the interviews, contact data were collected from the interviewees to validate and deepen specific themes.

Innovation ecosystems comprise a wide range of organizational actors. Approximately 2,200 organizations are settled in the Sophia Antipolis ecosystem, while approximately 120 organizations are settled in the Tecnosinos ecosystem. The snowball technique was endeavored to delimit the scope of the research. The focal point to start interviews was defined from the literature review of the cases. Three

actors were selected in the case of Sophia Antipolis and two other actors in the case Tecnosinos. From these initial interviewees, the indication was stimulated according to the alignment with the dynamics of promoting collaboration in the innovation ecosystem. Although necessary for scoping, this technique limits the plurality of field perceptions, especially in complex structures such as Sophia Antipolis.

Suggestions for future research

While responding to gaps proposed by the literature, this dissertation opens the way for new research that may advance knowledge about collaboration in innovation ecosystems. The indications for future studies point to the application of different methodological approaches, different scopes for analysis, and new interactions between theoretical perspectives within neo-institutionalism.

This dissertation adopts a dynamic approach to observe narratives (Gioia, Corley & Hamilton, 2013) that carry the institutional work practices (McGivern, 2015). With this approach, it was possible to observe three levels of analysis – *i.e.,* organizational, relational, and field. However, an invitation is made for temporal approaches to be applied to this analysis and thus to elucidate the evolution of practices, relational assets, and dimensions of institutional logics over time. Also, the typical juxtaposition of practices in process approaches (Zietsma & Lawrence, 2010; Sthyre, 2014) helps to understand the interaction between practices throughout time.

Under the aegis of the method, this dissertation also calls for research aimed at comparatively analyzing the fostering of collaboration for technological development inside and outside innovation ecosystems. It was not the scope of this dissertation to make such a comparison, as the proposal focused on in-depth analysis of the impact of institutional work practices on fostering collaboration. However, comparative analyses reinforce external validity and may contribute to building knowledge about collaboration in innovation environments.

From the theoretical perspective, the dissertation accepts the challenge of bridging the perspectives of institutional work and institutional logics, while reflecting the interplay between focal and complementary perspective – *i.e.,* figure and ground interplay (Zilber, 2013). As a result, this dissertation argues that relational assets may ease the dialogue between practices and logics. There remains the challenge of inverting the relationship, a shift between figure and ground (Zilber, 2013), where the

focus might be on institutional logics and their impact on institutional work practices. This new study may validate whether relational assets remain as facilitators between the two ends.

Finally, this dissertation invites researchers to include dichotomous variables such as centrality/plurality or public/private in the analysis of the participation of organizational actors in institutional work. Analyzes that might include these characteristics may position the agency's intensity and direction in future studies on institutional work.

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APPENDIX A – SEMISTRUCTURED QUESTIONARY IN PORTUGUESE

Esta pesquisa parte do tema da inovação e dos ecossistemas inovadores. As políticas de desenvolvimento dos ambientes de inovação, como os parques tecnológicos, geralmente descrevem uma rede complexa e dinâmica de organizações que trabalham para manter o ambiente atraente e produtivo.

O histórico do Tecnosinos parece seguir essa tradição. Esta pesquisa visa mapear essa rede de práticas conduzidas por esta diversidade de atores, a fim de tornar o Tecnosinos em um ambiente favorável à colaboração.

Como a organização que você representa é um ator importante na dinâmica do Tecnosinos, você está convidado a participar desta pesquisa. Como resultado, sua organização poderá obter uma visão geral dessa rede e identificar oportunidades de desenvolvimentos de acordos de colaboração ainda mais produtivos dentro do ecossistema.

Assim, estas questões que proponho dizem respeito a práticas desenvolvidas individualmente ou em grupo por atores públicos, privados ou da academia que respondem por facilitar a colaboração no Tecnosinos. Vale ressaltar que colaboração aqui se refere às interações propositivas entre empresas, institutos tecnológicos, universidade, prefeitura, etc., que levam à inovação tecnológica.

Apenas um lembrete, temos o acordo de confidencialidade que garante que sua identidade será preservada em todas as publicações provenientes desta tese.

CONTEXTO DO ECOSSISTEMA DE INOVAÇÃO
Governança – dinâmica – limites

1. O que é o Tecnosinos?
2. Qual o principal objetivo de sua existência?
3. Na sua visão, quais são os principais atores desse ambiente?
4. Você poderia nomear as principais universidades, centros de pesquisa, entidades governamentais, representantes da sociedade civil e agências de fomento?
5. Qual é a principal expertise reconhecida no Tecnosinos?
6. O que o diferencia de outros parques tecnológicos ou ambientes de inovação no Brasil ou no exterior?

7. Essa expertise é baseada em uma tradição regional ou foi desenvolvida nos últimos anos?
8. Como é a governança do Tecnosinos?
9. Como o Tecnosinos é organizado administrativamente?
10. E sobre as principais decisões, como definir prioridades para infraestrutura ou grandes eixos de desenvolvimento tecnológico, a estrutura de governança é a mesma?
11. Existe um grupo principal que apoia o desenvolvimento do Technopole? Quem faz parte deste grupo? Como é a interação entre seus membros?

DIMENSÕES DO TRABALHO INSTITUCIONAL
Instituição – atores – agência

1. Você considera o ambiente do Tecnosinos colaborativo? Por quê?
2. Existe uma estrutura formal ou informal que permita a colaboração entre pesquisadores, empreendedores e agentes de públicos?
3. Você acredita que empreendedores, pesquisadores vinculados a grandes empresas e pesquisadores vinculados à universidade "falam a mesma língua"? Ou seja, têm ideias convergentes?
4. Você poderia citar alguns exemplos de colaboração que levaram ao desenvolvimento de novas tecnologias aqui no Tecnosinos?
5. Sob o ponto de vista da sua empresa, quais são os principais parceiros quando se fala em desenvolvimento tecnológico?
6. Estes parceiros estão todos instalados no Tecnosinos? Há alguma preferência pelos parceiros instalados aqui?
7. Vocês sempre buscam parcerias para o desenvolvimento de novas tecnologias? Por quê?
8. Por que estes outros atores buscam vocês para estas parcerias?
9. Como é feita a governança destas parcerias? Há algum contrato que define regras de propriedade e coordenação?

PRÁTICAS DO TRABALHO INSTITUCIONAL
Estruturação social – configuração dos sistemas de confiança – coesão cognitiva

1. Retomando alguns exemplos de colaboração no parque, como ...., qual o papel da universidade, prefeitura, Acist-SL, neste movimento?
2. O que é feito em termos de estrutura para que a colaboração aconteça?
3. São realizados eventos, encontros, com o objetivo de gerar a interação entre diferentes atores do parque? Estes eventos são efetivos?

4. O que é feito para que empreendedores e pesquisadores vinculados a organizações diferentes (grandes empresas, startups, ITTs, Universidade, etc.) possam "falar a mesma língua", ou trabalhar ideias convergentes?
5. O que é feito para que estes diferentes atores possam superar barreiras culturais, como língua, hábitos locais, etc.?
6. Sob o ponto de vista legal/tributário, há alguma vantagem de sua empresa estar instalado no Tecnosinos? Há alguma vantagem deste tipo para que a empresa participe de ações colaborativas, como projetos conjuntos, por exemplo?
7. Quando falamos em colaboração, existem regras explícitas ou implícitas do ambiente? Algo proposto pelo Tecnosinos?
8. Há algum estímulo para que a empresa prefira parceiros de dentro ou fora do parque? Quais?
9. Além destas práticas, há alguma outra que você gostaria de comentar que é relevante para que a colaboração aconteça no Tecnosinos?
10. Qual é o principal desafio para manter o Tecnosinos em movimento?
11. Você diria que há uma forma de pensar comum (mind-set) entre os atores que constituem o Tecnosinos?
12. Como você descreveria essa forma de pensar?
13. Como você vê o futuro do Tecnosinos?

Cette recherche s'inscrit dans le thème de l'innovation et des écosystèmes innovants. Les politiques de développement des environnements d'innovation, tels que les parcs technologiques, décrivent généralement un réseau complexe et dynamique d'organisations travaillant pour maintenir un environnement attractif et productif.

Le parcours de Sophia Antipolis semble suivre cette tradition. Cette recherche vise à cartographier le réseau de pratiques menées par cette diversité d'acteurs afin de faire de Sophia Antipolis un environnement propice à la collaboration.

Comme l'organisation que vous représentez étant un acteur important de la dynamique de Sophia Antipolis, vous êtes invité à participer à cette recherche. Par conséquent, votre organisation pourra obtenir une vue d'ensemble de ce réseau et identifier des opportunités pour développer des accords de collaboration encore plus productifs au sein de l'écosystème.

Ainsi, ces questions que je propose concernent des pratiques développées individuellement ou en groupe par des acteurs publics, privés ou académiques chargés de faciliter la collaboration à Sophia Antipolis. Il convient de mentionner que la collaboration se réfère ici aux interactions ciblées entre les entreprises, les instituts technologiques, les universités, le secteur public, etc., qui conduisent à l'innovation technologique.

Pour rappel, nous avons un accord de confidentialité qui garantit que votre identité sera préservée dans toutes les publications issues de cette thèse.

CONTEXTE DE L'ÉCOSYSTÈME D'INNOVATION
Gouvernance - dynamique – limites

1. Qu'est-ce que c'est Sophia Antipolis?
2. Quel est le but principal de son existence?
3. Selon vous, quels sont les principaux acteurs de cet environnement?
4. Pourriez-vous nommer les principales universités, centres de recherche, entités gouvernementales, représentants de la société civile et agences de développement?
5. Quelle est la principale expertise reconnue à Sophia Antipolis?
6. Qu'est-ce qui le distingue des autres parcs technologiques ou environnements d'innovation en France ou à l'étranger?

7. Cette expertise est-elle basée sur une tradition régionale ou a-t-elle été développée ces dernières années?
8. Comment est la gouvernance de Sophia Antipolis?
9. Comment Sophia Antipolis est-elle organisée administrativement?
10. Qu'en est-il des principales décisions, comme la fixation des priorités pour les infrastructures ou les grands axes de développement technologique, la structure de gouvernance est-elle la même?
11. Existe-t-il un groupe central qui soutient le développement du Technopole? Qui fait partie de ce groupe? Comment est l'interaction entre ses membres?

DIMENSIONS DU TRAVAIL INSTITUTIONNEL
Institution - acteurs - agence

1. Considérez-vous que l'environnement de Sophia Antipolis est collaboratif? Pourquoi?
2. Existe-t-il une structure formelle ou informelle permettant la collaboration entre chercheurs, entrepreneurs et fonctionnaires?
3. Croyez-vous que les entrepreneurs, les chercheurs liés aux grandes entreprises et les chercheurs liés à l'université "parlent la même langue"? En d'autres termes, ont-ils des idées convergentes?
4. Pourriez-vous citer quelques exemples de collaboration qui ont conduit au développement de nouvelles technologies ici à Sophia Antipolis?
5. Du point de vue de votre organisation, quels sont les principaux partenaires en termes de développement technologique?
6. Tous ces partenaires sont-ils basés à Sophia Antipolis? Y a-t-il des préférences pour les partenaires installés ici?
7. Êtes-vous toujours à la recherche de partenariats pour le développement de nouvelles technologies? Pourquoi?
8. Pourquoi ces autres acteurs vous recherchent-ils pour ces partenariats?
9. Comment ces partenariats sont-ils gérés? Existe-t-il un contrat qui définit les règles de propriété et de coordination?

PRATIQUES DE TRAVAIL INSTITUTIONNELLES
Structuration sociale - configuration des systèmes de confiance - cohésion cognitive

1. Pour utiliser quelques exemples de collaboration dans le parc, tels que ...., quel est le rôle de l'université, des centres de recherche, des agences de développement, dans ce mouvement?
2. Que faisons-nous pour structurer la collaboration?

3. Des événements et des réunions sont-ils organisés afin de générer une interaction entre les différents acteurs du parc? Ces événements sont-ils efficaces? Pourriez-vous nommer certains de ces événements?
4. Que fait-on pour que les entrepreneurs et chercheurs liés à différentes organisations (grandes entreprises, startups, universités, centres de recherche, etc.) puissent "parler le même langage" ou travailler sur des idées convergentes?
5. Que fait-on pour que ces différents acteurs puissent surmonter les barrières culturelles, telles que la langue, les habitudes locales, etc.?
6. D'un point de vue juridique / fiscal, y a-t-il un avantage pour une entreprise à s'implanter à Sophia Antipolis? Y a-t-il des avantages de ce type pour l'entreprise à participer à des actions collaboratives, comme des projets communs par exemple?
7. En termes de collaboration, existe-t-il des règles explicites ou implicites pour l'environnement? Pourriez-vous nommer certaines de ces règles?
8. L'entreprise est-elle encouragée à préférer des partenaires à l'intérieur ou à l'extérieur du parc? Comment ça marche?
9. En plus de ces pratiques, y a-t-il d'autres que vous souhaiteriez commenter qui sont pertinentes pour la collaboration qui aura lieu à Sophia Antipolis?
10. Quel est le principal défi pour faire avancer Sophia Antipolis?
11. Diriez-vous qu'il existe une façon de penser (état d'esprit) commune parmi les acteurs qui composent Sophia Antipolis?
12. Comment décririez-vous cette façon de penser?
13. Comment voyez-vous l'avenir de Sophia Antipolis?

This research sets under the theme of innovation and innovation ecosystems. Policies for the development of innovation environments, such as technology parks, generally describe a complex and dynamic network of organizations working to maintain an attractive and productive environment.

The journey of Sophia Antipolis/Tecnosinos seems to follow this tradition. This research aims to map the network of practices carried out by this diversity of actors in order to make Sophia Antipolis/Tecnosinos an propitious environment for collaboration.

As the organization you represent is an important player in the dynamics of Sophia Antipolis/Tecnosinos, you are invited to take part in this research. As the outcome, your organization will have an overview of this network and identify opportunities to develop even more productive collaboration agreements within the ecosystem.

Thus, these questions that I propose deals with practices developed individually or in groups by public, private or academic actors responsible for facilitating collaboration in Sophia Antipolis. It should be mentioned that collaboration here refers to purposeful interactions among companies, technological institutes, universities, public entities, etc., which lead to technological innovation.

As a reminder, we have a confidentiality agreement which guarantees that your identity will be preserved in all the publications resulting from this dissertation.

CONTEXT OF THE INNOVATION ECOSYSTEM
Governance - dynamics – boundaries

1. What is Sophia Antipolis/Tecnosinos?
2. What is the main purpose of its existence?
3. In your view, who are the main actors in this environment?
4. Could you name the main universities, research centers, government entities, representatives of civil society and development agencies?
5. What is the primary recognized expertise in Sophia Antipolis/Tecnosinos?
6. What sets it apart from other technology parks or innovation environments in France or abroad?
7. Is this expertise based on a regional tradition or has it been developed in recent years?

8. How is the governance of Sophia Antipolis/Tecnosinos?
9. How is Sophia Antipolis/Tecnosinos organized administratively?
10. What about the main decisions, like setting priorities for infrastructure or major axes of technological development, is the governance structure the same?
11. Is there a core group that supports the development of Sophia Antipolis/Tecnosinos? Who is part of this group? How is the interaction between its members?

DIMENSIONS OF INSTITUTIONAL WORK

Institution - actors - agency

1. Do you consider Sophia Antipolis/Tecnosinos' environment to be collaborative? Why?
2. Is there a formal or informal structure that allows collaboration between researchers, entrepreneurs and public agents?
3. Do you believe that entrepreneurs, researchers linked to large companies and researchers linked to the university "speak the same language"? That is, do they have converging ideas?
4. Could you mention some examples of collaboration that led to the development of new technologies here at Sophia Antipolis/Tecnosinos?
5. From the point of view of your organization, who are the main partners when it comes to technological development?
6. Are these partners all installed in Sophia Antipolis/Tecnosinos? Are there any preferences for the partners installed here?
7. Do you always seek partnerships for the development of new technologies? Why?
8. Why do these other actors seek you for these partnerships?
9. How are these partnerships managed? Is there a contract that defines ownership and coordination rules?

INSTITUTIONAL WORK PRACTICES

Social structuring - configuration of trust systems - cognitive cohesion

1. To resume some examples of collaboration in the park, such as ...., what is the role of the university, research centers, development agencies, in this movement?
2. What is done in terms of structure for collaboration to happen?
3. Are events, meetings, held with the objective of generating interaction between different actors in the park? Are these events effective?

4. What is done so that entrepreneurs and researchers linked to different organizations (large companies, startups, Universities, research centers, etc.) may "speak the same language", or work on converging ideas?

5. What is done so that these different actors can overcome cultural barriers, such as language, local habits, etc.?

6. From a legal / tax point of view, is there any advantage for a company to settle in Sophia Antipolis/Tecnosinos? Are there any advantages of this type for the company to participate in collaborative actions, such as joint projects, for example?

7. When it comes to collaboration, are there any explicit or implicit rules for the environment? Something proposed in Sophia Antipolis/Tecnosinos?

8. Is there any incentive for the company to prefer partners inside or outside the park? Which are they?

9. In addition to these practices, are there any others that you would like to comment on that are relevant for the collaboration to take place in Sophia Antipolis/Tecnosinos?

10. What is the main challenge to keep Sophia Antipolis/Tecnosinos moving?

11. Would you say that there is a common way of thinking (mind-set) among the actors that make up Sophia Antipolis/Tecnosinos?

12. How would you describe this way of thinking?

13. How do you see the future of Sophia Antipolis/Tecnosinos?

ACORDO DE CONFIDENCIALIDADE

Você é convidado a participar da pesquisa intitulada "Redes Interorganizacionais no Desenvolvimento de Ecossistemas de Inovação", sob a responsabilidade do pesquisador Felipe de Mattos Zarpelon, inscrito no doutorado em Ciências de Gestão no *Institut d'Administration des Entreprises* (IAE) de Poitiers (França) e no doutorado em Administração na Universidade do Vale do Rio dos Sinos - UNISINOS - (Brasil).

Sua participação consiste em uma entrevista, com perguntas gerais, nas quais você deve responder de acordo com seu conhecimento e experiência. Sua opinião é extremamente importante e será essencial para a compreensão do tema em estudo.

Você não será identificado em momento algum. A pesquisa será publicada e sua identidade ainda assim será preservada. Você não terá despesas ou receitas advindas da participação nesta pesquisa.

Os benefícios desta pesquisa baseiam-se na análise de estruturas, dinâmicas e desempenho de redes compostas por atores organizacionais dentro de ecossistemas de inovação. Além disso, esta pesquisa visa esclarecer como as organizações constroem redes para desenvolver e sustentar a atratividade do ecossistema de inovação.

Este acordo é composto por duas cópias com igual valor. Uma dessas cópias fica com você e a outra será armazenada para registro de pesquisa. Você pode resolver qualquer dúvida sobre esta pesquisa contatando o pesquisador Felipe de Mattos Zarpelon (telefone: (51) 99133.0337 ou e-mail: felipemz@edu.unisinos.br). Você também pode entrar em contato com os orientadores da tese: Prof. Alsones Balestrin (e-mail: abalestrin@unisinos.br) Prof. Eric Milliot (emilliot@poitiers.iae-france.fr).

( ) Aceito participar da pesquisa acima citada.

( ) Aceito a gravação desta entrevista.

_____, _____

(cidade)   (data)

_____   _____

Felipe de Mattos Zarpelon   Nome do participante:

Acordo de Cotutela Internacional de Tese
IAE de Poitiers
Universidade do Vale do Rios dos Sinos

APPENDIX E – CONFIDENTIALITY AGREEMENT IN FRENCH

ACCORD DE CONFIDENTIALITÉ

Vous êtes invités à participer à la recherche intitulée "Réseaux organisationnel dans le développement des écosystèmes d'innovation", sous la responsabilité du chercheur Felipe DE MATTOS ZARPELON, inscrit au Doctorat en Sciences de Gestion à l'Institut d'Administration des Entreprises (IAE) de Poitiers (France) et au Doctorat en Administration à l'Universidade do Vale do Rio dos Sinos - UNISINOS (Brésil).

Votre participation consiste en un entretien, avec des questions d'ordre générale, dans lequel nous vous sollicitons de répondre en fonction de vos connaissances et de votre expérience. Votre avis est extrêmement important et sera essentiel à la compréhension du sujet d'étude.

Vous ne serez identifié à aucun moment dans aucun document officiel. Les résultats de la recherche seront publiés et nous vous assurons que votre identité sera toujours préservée. Vous n'aurez aucune dépense, ni aucun revenu pour participer à cette recherche.

Les aboutissants de cette recherche reposent sur l'analyse des structures, de la dynamique et de la performance de réseaux composés d'acteurs organisationnels au sein d'écosystèmes d'innovation. En outre, cette recherche vise à clarifier la manière dont les organisations créent des réseaux pour développer et maintenir l'attractivité de l'écosystème de l'innovation.

Ce formulaire est composé de deux copies de valeur identique. L'une de ces copies restera chez vous et l'autre sera enregistrée dans les archives de recherche. Si vous avez des doutes sur cette recherche, vous pouvez contacter le chercheur Felipe DE MATTOS ZARPELON (téléphone: +33 (0) 7 66 57 49 21 ou e-mail: felipe.de.mattos.zarpelon@univ-poitiers.fr). Vous pouvez également contacter les directeurs de thèse: M Alsones BALESTRIN (e-mail: abalestrin@unisinos.br) et M Eric MILLIOT (emilliot@poitiers.iae-france.fr).

( ) J'accepte de participer au projet ci-dessus.

( ) Je suis d'accord avec l'enregistrement de cette entretien.

_____,_____

(ville)   (date)

_____   _____

Felipe DE MATTOS ZARPELON   Participant:

Convention Internationale pour la Cotutelle de Thèse
IAE de Poitiers
Universidade do Vale do Rios dos Sinos

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