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DOCTORAL THESIS

BLACKNESS 4.0: ECOSYSTEM DYNAMICS, DIGITAL TECHNOLOGIES FOR SOCIAL PROGRESS, AND THE ETHNO-RACIAL ENTREPRENEURSHIP RESEARCH

Diego Souza Silva

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I dedicate this work to my (genealogic and diasporic) families.

I dedicate this work to all Black people across the world
murdered by matters of race and skin color.

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"Every human society must justify its inequalities: unless reasons for them are found, the whole political and social edifice stands in danger of collapse. Every epoch therefore develops a range of contradictory discourses and ideologies for the purpose of legitimizing the inequality that already exists or that people believe should exist."

Thomas Piketty

"I want to begin [...] emphasizing the urgent need of the Brazilian Black people to win back their memory, which has been systematically assaulted by Brazilian Western-inspired structures of domination for almost 500 years."

Abdias do Nascimento

"Mas não basta, pra ser livre
Ser forte, aguerrido e bravo
Povo que não tem virtude
Acaba por ser escravo"

Excerpt from the Rio Grande do Sul anthem

RESUMO

As tecnologias digitais são cada vez mais centrais nos debates acadêmicos e corporativos atuais para o desenvolvimento de negócios e progresso socioeconômico das nações em todo o mundo. Paralelamente a esse movimento crescente, acadêmicos, formuladores de políticas e organizações recentemente também se voltaram para a visualização de arranjos territoriais e industriais como ecossistemas. Ao todo, essas tendências contemporâneas – aqui apelidadas de dinâmicas 4.0 – têm várias implicações poderosas (e ainda) pouco estudadas para políticas e práticas, especialmente no que diz respeito a como elas podem afetar indivíduos pertencentes a grupos étnico-raciais marginalizados e sub-representados. A presente tese investiga essa preocupação para explorar (i) como os ecossistemas locais podem ser forjados, (ii) como as tecnologias de informação e comunicação podem ser adotadas para dar conta do desenvolvimento inclusivo e mitigar desigualdades, e (iii) como a literatura étnico-racial pode avançar para abordar os efeitos negligenciados das dinâmicas 4.0 em populações discriminadas e menos favorecidas. Para atender a esse propósito, o trabalho é composto por três investigações que abrangem uma pesquisa multimétodo, combinando tanto abordagens qualitativas (etnografia, estudo de caso) quanto quantitativas (análise estatística a partir de bases secundárias, análise bibliométrica). Cada uma das investigações visa, respectivamente: (a) revelar os principais mecanismos mobilizados para lançar e desenvolver ecossistemas locais, (b) identificar elementos para orientar adequadamente os formuladores de políticas e pesquisadores na alavancagem da adoção de tecnologia para o progresso socioeconômico, e (c) mapear a literatura de empreendedorismo étnico-racial e disponibilizar uma agenda estruturada à luz das dinâmicas 4.0. Os resultados ajudam a entender os fenômenos modernos, lançando luz sobre a atual adoção de tecnologia para crescimento inclusivo, bem como mobilizações locais para o desenvolvimento do empreendedorismo inovador e ganho de vantagem competitiva. Além disso, é estruturada uma agenda para que a literatura étnico-racial aborde as (e se beneficie das) dinâmicas contemporâneas de forma mais adequada.

Palavras-chave: adoção de tecnologias de informação e comunicação, estratégia ecossistêmica, empreendedorismo étnico-racial, inovação, desenvolvimento regional

ABSTRACT

Digital technologies are increasingly central in current academic and corporate debates for business development and socioeconomic progress of nations worldwide. Parallel to this growing movement, scholars, policymakers, and organizations have recently also turned to the visualization of territorial and industrial arrangements as ecosystems. Altogether, these contemporary trends – herein dubbed dynamics 4.0 – have several powerful (and yet) understudied implications for policy and practice, especially regarding how they may affect marginalized, underrepresented, ethno-racial individuals. The present thesis delves into this concern to explore (i) how local ecosystems may be forged, (ii) how information and communication technology may be adopted to account for inclusive development and to mitigate divides, and (iii) how can ethno-racial literature move forward to address overlooked effects of dynamics 4.0 on discriminated and less-favored populations. To meet this purpose, the present work is comprised of three investigations encompassing multi-method research, combining both qualitative (i.e., ethnography, case study) and quantitative (i.e., survey research with statistical analysis, bibliometric analysis). Each one of the investigations aim at, respectively: (a) disclosing key mechanisms mobilized to launch and develop local ecosystems, (b) identifying elements to properly guide policymakers and researchers in leveraging technology adoption for socioeconomic progress, and (c) science mapping the ethno-racial entrepreneurship literature and providing a structured agenda in light of the dynamics 4.0. The results help to understand modern phenomena, shedding light on current technology adoption for inclusive growth, as well as local mobilizations for entrepreneurial development and competitive advantage. Moreover, it sets a structured agenda for ethno-racial literature to address (and benefit from) contemporary dynamics more properly.

Key words: information and communication technology adoption, ecosystem strategy, ethno-racial entrepreneurship, innovation, regional development

SUMMARY

1 INTRODUCTION

Digital technologies are increasingly central in current academic and corporate debates, as their evolution in recent years have boosted disruptions and dependencies across industries and within societies (FLYVERBOM; DEIBERT; MATTEN, 2019). From the industrial perspective, for instance, historical, technological progress has propelled extensive changes in manufacturing settings – often referred to as revolutions – and the cutting-edge digital technologies (such as the Internet of Things and additive manufacturing) drove the world to what has been acknowledged as the Fourth Industrial Revolution, also known as the Industry 4.0 (XU; XU; LI, 2018). Such a revolution rapidly spilled over other domains, and the same terminology has been used to explore the implications of 'technologies 4.0' (VALAMEDE; AKKARI, 2020) across several fields, as the cases of Tourism 4.0 (STANKOV; GRETZEL, 2020), Quality 4.0 (EMBLEMSVÅG, 2020), or Education 4.0 (SUWARNO; NERRU PRANUTA, 2019). In the case of entrepreneurship and new business development, studies have disclosed how the recent (r)evolution of digital technologies provides novel opportunities for entrepreneurial activity (HULL et al., 2007), also entailing shifts in how new business models may be shaped (KRAUS et al., 2019); still, several digital affordances are to be explored (AUTIO et al., 2018).

Parallel to this movement, scholars, policymakers, and organizations have recently also turned to the visualization of territorial and industrial arrangements as ecosystems. This rationale draws on a perspective initially introduced by Moore (1993) in which "ecological aspects relate to the interdependency among different actors, and to the co-evolution that binds them together over time" (RITALA; ALMPANOPOULOU, 2017, p. 39). In this regard, ecosystems denote loose networks of different stakeholders striving for innovation and competitive advantage, also sharing the fate of the network as a whole (IANSITI; LEVIEN, 2004). Over the past few years, the concept—initially proposed as business ecosystem—gained momentum and was incorporated in several management subfields to address more specific explorations, as the cases of entrepreneurial ecosystems (ACS et al., 2017; AUTIO; LEVIE, 2017), innovation ecosystems (ADNER; KAPOOR, 2010; AUTIO; THOMAS, 2014), or knowledge ecosystems (CLARYSSE et al., 2014; VAN DER BORGH; CLOODT; ROMME, 2012).

Although research on Industry 4.0 and ecosystems are not straightforwardly linked, both perspectives have increased steadily in scholarly outlets (JACOBIDES; CENNAMO; GAWER, 2018; NAZAROV; KLARIN, 2020) and new implications drawn from the digital technological advancements also boosted investigations on Information and Communication Technologies (ICT) and digital ecosystems (LEE; KIM, 2018; SUBRAMANIAM; IYER; VENKATRAMAN, 2019). Again, despite not explicitly connected, some studies disclose how ecosystems may be created or established around technological innovations (e.g., DATTÉE; ALEXY; AUTIO, 2018; KUMAR et al., 2020) and the state-of-the-art of the Industry 4.0 taxonomy reveals research clusters exploring the integration of technologies and technological advancements as a driving force of the current industrial revolution (NAZAROV; KLARIN, 2020). Thus, in the present work, I dub dynamics 4.0 to account for the very recent growing attention towards the ecosystem rationale and digital technologies for business and regional development (i.e., beyond the industrial domain).

When addressing business development, it would be frivolous not to refer to the entrepreneurship literature. On this account, entrepreneurial activity is very often displayed as a solution to overcome challenges of personal emancipation, poverty and inequality (BRUTON; KETCHEN; IRELAND, 2013; RINDOVA; BARRY; KETCHEN, 2009; TEDMANSON et al., 2012). Additionally, entrepreneurship has historically been viewed as a meritocratic activity in which disadvantaged people can equally succeed through hard work (OGBOR, 2000; VERDUIJN; ESSERS, 2013). In the context of digital entrepreneurship, studies seldom account for diversity or the participation of marginalized populations (SAHUT; IANDOLI; TEULON, 2019; SUSSAN; ACS, 2017), which has suffered criticism since entrepreneurship is not always equally created (DY, 2020).

Similarly, as previously stated, the concept of ecosystem was introduced (and adopted within several ramifications) as an analogy to the ecological rationale of a variety of different agents striving for innovation and value creation (SCARINGELLA; RADZIWON, 2018). Nevertheless, though many works do address human actors from different hierarchies or institutions (e.g., entrepreneurs, policymakers, professors), the exploration of diversity within such strata is overlooked.

If, on the one hand, the gender under-representation in male-dominated high-level networks have pushed scholars to challenge this *status quo* and acknowledge the importance of the hitherto disregarded women within these studies (e.g., MCADAM; HARRISON;

LEITCH, 2019; NEUMEYER et al., 2019), the same is not true when it comes to race, and scholars of color still struggle to dismantle the white supremacy within the management and business domains (BELL et al., 2021; DAR et al., 2021). One must bear in mind that capitalism is racist (BHATTACHARYYA, 2018; DAVIS, 1971; LORDE, 2016) and, in all its types (colonial, slave, financial, market, information), capitalism has adopted a racist logic separating superior white humanity from deficient Black non-humans (MILLS, 1997), which tends to persist as studies fall short in addressing the perspective of racialized groups within entrepreneurial and digital dynamics (BAKER; WELTER, 2017; DY, 2020; DY; MARLOW; MARTIN, 2017). On that account, I posit the following research question: *how are ethno-racial individuals (dis)regarded within dynamics 4.0?* In this thesis, I aim to delve into this research question to deepen our understanding of the topic and to theorize mechanisms underpinning contemporary arrangements.

1.1 **Theme, Scope, and Objectives**

From the rationale outlined above, the primary goal of the thesis is to problematize the disregard for the lived experiences of the Black community by bringing to the fore the strategy-making/implementation processes underneath the establishment of ecosystems and digital adoption for inclusive development, and thus put forward a more balanced account of their relevance in such dynamics 4.0. For that purpose, I aim at:

- Identifying fundamental mechanisms underpinning the strategizing of ecosystems;
- Verifying whether (racial) diversity is addressed in the processes of creating/nurturing local ecosystems and leveraging digital technologies for socio-economic progress;
- Science mapping the ethno-racial entrepreneurship literature and linking it to the dynamics 4.0.

1.2 **Justification of the research problem**

Entrepreneurship plays a critical role in stimulating economic growth. Along with digital technologies, entrepreneurial activity has been recognized for driving innovation and technological advancement, increasing employment and propelling societal change

(AUDRETSCH; THURIK, 2001; MALCHOW-MØLLER; SCHJERNING; SØRENSEN, 2011; PRIEGER et al., 2016; RINDOVA; BARRY; KETCHEN, 2009). On this account, several locations worldwide are turning to information technologies and to potential outcomes of entrepreneurial ecosystems (EEs) to increase competitiveness while increasing the quality of life of citizens (APPIO; LIMA; PAROUTIS, 2019).

The establishment of EEs has been the subject of scholarly and media attention (JACKSON et al., 2016; SPIGEL, 2016; WEBER, 2021). Several cities and nations are striving to emulate the *success* of the much-acclaimed Silicon Valley model of entrepreneurship (AUDRETSCH, 2019; ENGEL, 2015; POLLIO, 2020). Nevertheless, apart from the emerging problems in this specific type of EE itself – e.g., gentrification, scarce and expensive housing, all leading employees to resort to living out of cars and recreational vehicles (BARR, 2019; NIEVES, 2000) –, scholars have also turned to the disregard of specific groups of populations within these contemporary arrangements. Women, ethnic minorities, immigrants, LGBTQ+, disabled people, and populations with characteristics different than the hegemonic ideal type of *the entrepreneur* as being a straight, white male (DY, 2020; OGBOR, 2000), have stood outside the considerations of emerging EEs (NEUMEYER et al., 2019; NEUMEYER; SANTOS; MORRIS, 2019). Even more specifically, recent evidence shows black individuals have faced the perpetuation of structural discrimination within dynamics 4.0, as consumers and investors negatively assess the quality of products and projects of African Americans when compared to white counterparts (YOUNKIN; KUPPUSWAMY, 2018, 2019).

As an emerging economy, Brazil has a long history of racial inequality and discrimination, dating back to the colonial period when Europeans first arrived on the continent and began enslaving the indigenous people and African slaves (DA SILVA, 1998). Even though slavery was abolished in 1888, the legacy of racial inequality continues to affect Brazilian society today. Black Brazilians, who make up around 56% of the population (IBGE, 2019), continue to face significant disparities in the labor market, access to resources, education, and the criminal justice system.

A recent report from the Brazilian Institute of Geography and Statistics (IBGE, 2022) shows how black Brazilians face significant levels of inequality in the labor market. According to the report, the average income of white people is more than 70% higher than

black and mixed-race[1] individuals; furthermore, white Brazilians hold 69% of managerial positions in organizations (against 29.5% occupied by blacks and mixed-race), and whites represent 79.1% of the owners of large agricultural establishments - with over 10,000 hectares (IBGE, 2022). Last, African-Brazilians only represent nearly 25% of startup founders (ABSTARTUPS, 2021; BLACKROCKS, 2021)

In the present work, I refer to *blackness* as Stuart Hall's (1993) conception of the 'black popular culture', a term that has come to denote the various black communities where "traditions were kept, and whose struggles survive in the persistence of the black experience (the historical experience of black people in the diaspora), of the black aesthetic (the distinctive cultural repertoires out of which popular representations were made), and of the black counternarratives" this population have struggled to voice (p. 110).

EEs comprise sets of social, economic, cultural, and political factors that contribute to the commercialization of entrepreneurial opportunities and the development of entrepreneurial activity (AUDRETSCH; BELITSKI, 2017; STAM, 2015). Fundamentally, diversity should be seen as a powerful proxy impacting entrepreneurial outcomes within urban areas (AUDRETSCH; BELITSKI; KOROSTELEVA, 2021). Studies on dynamics 4.0 tend to overlook the implications of digital technologies and ecosystem development beyond the hegemonic populations. In this thesis, I contend that much of this reproduction stems from the dearth of a critical appraisal of the ongoing process of making and implementing strategies in these modern dynamic forces. As such, only by unpacking the black box[2] of dynamics 4.0, it will be possible to dismantle its *modus operandi* to advocate for a more comprehensive agenda.

1.3 **Research method**

For this thesis, I rely on the transformative paradigm (MACKENZIE; KNIPE, 2006) to inform the philosophical and theoretical basis adopted and to guide the research design. For the transformative paradigm, it is of central importance to address the lives and experiences of non-traditional, marginalized individuals to analyze how and why inequities (based on

[1] Referred to as *pardo* in Brazilian Portuguese.

[2] I refer to *black box* as the way scientific and technical work is made invisible by focusing only on its inputs and outputs, and not on its internal complexity. According to some sociological perspectives (such as the actor-network theory) the more science and technology succeed, the opaquer and more obscure they become (LATOUR, 1999).

gender, race, ethnicity, disability, sexual orientation, and socioeconomic classes) are linked to political and social action (MERTENS, 2009). Thus, research inquiry is usually intertwined with politics and a political change agenda (CRESWELL; CRESWELL, 2018).

This thesis draws on multi-method research, as it combines, at different levels and moments, procedures, and data sources of qualitative and quantitative nature. As advocated elsewhere (MACKENZIE; KNIPE, 2006; MERTENS, 2009), multi-method research affords transformative researchers a more comprehensive portrait of the social world by mixing perspectives and lenses, and enriching the capture of the complexity of human rights and social transformation. Hence, I strive to combine the advantages of qualitative research, herein adopted to investigate (in depth) the dynamics involved in a multifaceted phenomenon (GOFFIN et al., 2019), with its specific nuances and distinctions in the Brazilian context, with the advantages of quantitative research, expressed in statistical analyses.

Our ability to understand and evaluate theory-development research, particularly a theory grounded in systematic observation, is improved by knowledge of the process of its creation (FAYARD; WEEKS, 2007). In this study, the original field study was inductive, and it was designed to examine the construction of alliances and relationships within local ecosystems. During fieldwork, and as I conducted a reflective "observant participation" (HONER; HITZLER, 2015), what emerged unexpectedly in the observations, and what led to a change in the focus of the study was the degree to which people debated over issues of diversity and inclusion. Intrigued by the social nature of the phenomenon under investigation, I turned to the serendipitous account observed (CUNHA; CLEGG; MENDONÇA, 2010) to explore the discussions and some implications to the dynamics 4.0 more broadly, combining field research, survey, statistical analysis and science mapping (Table 1).

Figure 1 depicts the rationale behind the research design. For each question within boxes A, B, and C in the image, a product will be presented in the form of a framework/model, a prescription, or a critical discussion. Next, Table 1 presents the related stages to performing the research and meeting the research objectives presented previously (Section 1.1).

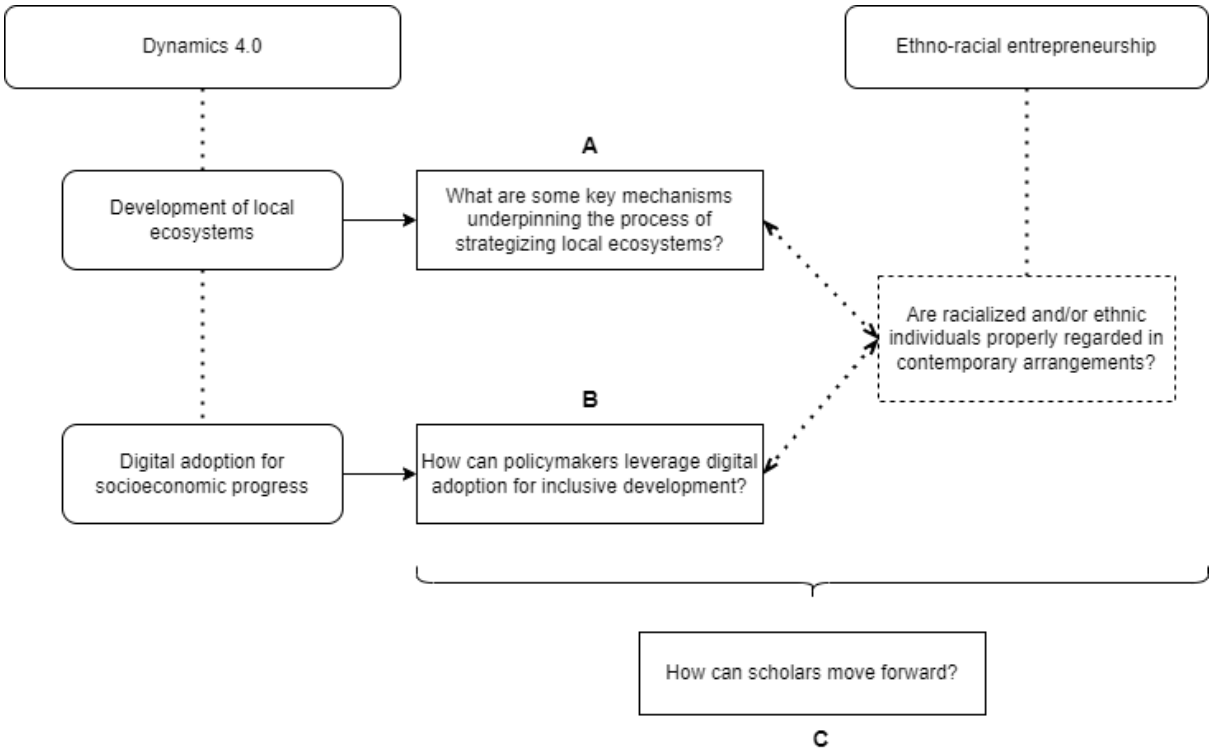

Figure 1. Research rationale.

Table 1. Stages of the research

	Research questions	Research goals	Method
Paper 1	**A.** What are some key mechanisms underpinning the process of strategizing local ecosystems?	To identify strategic practices mobilized to launch and develop local ecosystems and link it to dynamics 4.0.	Exploratory qualitative research. Longitudinal in-depth ethnography
Paper 2	**B.** How can policymakers leverage digital adoption for inclusive development?	To detect elements to guide policymakers and researchers in leveraging technology adoption for socioeconomic progress.	Exploratory quantitative research. Survey data. Statistical analysis.
Paper 3	**C.** How can scholars move forward?	To science map the ethno-racial entrepreneurship literature and to provide a structured agenda considering the dynamics 4.0	Systematic literature review. Bibliometric and content analyses.

It is worth noting that, for the present thesis, I will conduct a systematic review in the final stage of the research process and not as an initial phase of setting the ground and planning the execution of the remaining investigations. This *unusual* structure stems from the rationale that, first, I intend to problematize actual undertakings related to dynamics 4.0, and then provide a means to guide future research on the ethno-racial entrepreneurship literature also considering pitfalls observed during the empirical investigations. Thus, the science mapping will serve as a final deliverable accruing from the set of research articles.

1.4 **Limitations**

The present work approaches the development of entrepreneurial activity from a particular population (Black people) considering the ecosystem and digitalization perspectives. The thesis is based on a series of investigations in which both perspectives were adopted, but not necessarily intertwined; that is to say, the thesis sheds light on implications stemming from ecosystem arrangements and digital evolution for (Black) entrepreneurship (AUDRETSCH et al., 2019; KRAUS et al., 2019; NAMBISAN, 2017; NEUMEYER et al., 2019), but any endeavor to investigate digital ecosystems (SONG, 2019; SUSSAN; ACS, 2017) goes beyond the scope of the present work.

1.5 **Thesis structure**

The present doctoral thesis is structured in the form of chapters. The first chapter encompasses the introductory section, including the overall research context and objectives, the importance of the topic, and the stages of the research. Next, each chapter (from sections 2 to 4) comprises a research article that is designed following the research rationale and stages presented previously (Figure 1, Table 1).

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2 PAPER 1 – Strategizing collaborative urban ecosystems: mechanisms, wicked problems, and micro-political dynamics

Abstract

The early stages of ecosystems remain under-theorized, mainly from the urban perspective. We adopt ethnographic research drawing on the actor-network theory and Schatzki's social site ontology to study a nascent collaborative ecosystem in the Brazilian city of Porto Alegre. We conceptualize and explore fundamental mechanisms strategists use to enroll and attain urban agents, and to attempt to stabilize wicked problems: (a) legitimizing leaders, (b) sustaining expertise, (c) steering ideologies, and (d) foregrounding the strategic discourse. We contribute to the ecosystem strategy literature by theorizing the process of developing urban ecosystems, shedding light on the mechanisms underpinning such a process, and introducing a new theoretical approach to study the strategizing and organizing of urban ecosystems from a practice perspective. Additionally, we reveal the critical role of academia in interesting agents in a conflicting political context, and controversies regarding (racial and gender) diversity that may arise when adopting global ideological discourses in pluralistic settings.

Keywords

Strategy-as-practice; Regional Development; Urban planning; Actor-network theory; Social site ontology; Storytelling.

Strategy is always a work in process; the indetermination of strategies, however, is a piece of social construction that takes place in an already structured space of significations, privileges and practices. Not only officially formulated strategists have strategies. Strategy is more properly conceived as a discourse in which some voices may not be attended to for some time, but which can, if insistent and well organized, make it on to the agenda (CARTER; CLEGG; KORNBERGER, 2008, p. 94).

2.1 **Introduction**

Studies on different sorts of ecosystem are gaining considerable interest over the past few years (SCARINGELLA; RADZIWON, 2018). The central idea in the ecosystem lens lies in collaborative (also coopetitive) interdependent arrangements among varied stakeholders for mutual effectiveness and survival (ADNER, 2017; IANSITI; LEVIEN, 2004). In this regard, research on urban ecosystems are still scarce, and investigations documenting activities within ecosystems over time remain primarily uncovered (AUTIO; THOMAS, 2019; PHILLIPS; RITALA, 2019). This is important because studies can reveal how firms adjust strategies to overcome coopetitive tensions and how such tensions evolve (Hannah & Eisenhardt, 2018). Investigating dynamics in nascent urban ecosystems can provide fruitful implications for the strategy and organizational studies literature. For instance, scholars investigating strategies within ecosystems generally emphasize key players involved in the creation of value and provision of stability for the entire community. This player is regarded as the focal actor (ADNER, 2017), ecosystem leader (MOORE, 1996), or keystone firm (IANSITI; LEVIEN, 2004). Nevertheless, overly focusing on governance and orchestration matters leads to neglecting the transformative and powerful effects of relationships coevolving with the ecosystem (AUTIO; THOMAS, 2019). Urban ecosystems entail multitudes of public and private agents, and exploring relationships could disclose timely challenges regarding conflicting political and economic interests (e.g. KORNBERGER et al, 2017).

One possible way to address this issue would be to explore how strategic work in urban ecosystems is put together in practice. In this regard, previous studies disclosed individuals' perceptions as to their strategic role even when such a role was not formal (MANTERE, 2008), and analyzed how corporate and business practices evolved amid a strategic change process (PAROUTIS; PETTIGREW, 2007). On this matter, strategizing refers to the 'doing of strategy' and is deeply based on the Strategy-as-Practice (SaP)

perspective (JARZABKOWSKI; BALOGUN; SEIDL, 2007; JOHNSON; MELIN; WHITTINGTON, 2003). Advocates of such a perspective claim an increasing dissatisfaction with conventional strategy research which underscores human activities and primarily focuses on an elite group acting strategically (JARZABKOWSKI; SPEE, 2009; JOHNSON et al., 2017). Thus, SaP examines detailed practices and micro-activities (WHITTINGTON, 2006) to reveal not only *what* is done, but *how* (DE CERTEAU, 2002).

Despite its contribution to the literature, SaP studies do not use the practice concept to its full extent. More recently, Burgelman et al. (2018, p. 550) revealed SaP studies have not "fully embraced the importance of emotions, mood, or affect in strategy-making." Along with this observation, the authors pointed to remaining opportunities to further explore matters of temporality, actors and agency, and materiality in SaP research; all insights previously called upon (c.f. CARTER et al., 2008; VAARA; WHITTINGTON, 2012). This ongoing gap limits the potential impact of such studies, as well as our understanding of strategizing and organizing practices within contemporary dynamics, such as ecosystem development.

Building on this rationale, *how do collaborative urban ecosystems come into being? What are the underpinning dynamics and mechanisms of the ecosystem? How are ideologies and stories translated into strategies, and how are such strategies shaped? Which sorts of controversies emerge and how are they stabilized?*

Studies have investigated discursive features and practices in initiatives held across the globe (KORNBERGER; CLEGG, 2011; VAARA et al, 2010). Nevertheless, though some of these studies covered public-private partnerships and/or some of the effects on society, by adopting an ecosystem perspective, we provide an account for a wider spectrum of individuals and institutions in the practice of strategizing, which can be more representative of a city population, also entailing broader implications.

This study explores the unfolding of a collaborative urban ecosystem in the Brazilian city of Porto Alegre. We adopt ethnographic research drawing on the actor-network theory (ANT) (CALLON, 1984; LATOUR, 2005) and the social site ontology (SCHATZKI, 2002) to respond to the research questions more comprehensively. We contribute by displaying the unraveling of a collaborative urban ecosystem in an ongoing process, rather than stabilized. We conceptualize the development of a nascent urban ecosystem as a form of strategizing to navigate micro-political dynamics, as well as to manage fundamental mechanisms to legitimize strategists and stabilize disputes. By mobilizing ANT and Schatzki's social site

ontology, we introduce a new theoretical approach to study strategy work within ecosystems on a practice perspective. Finally, we not only add to the literature on ecosystems and urban planning, but we also contribute by addressing matters of temporality, emotions, agency, and materiality within strategizing and organizing research. We reveal how strategies are forged and their implications in such a complex environment with multitudes of actors with different (political and economic) interests.

2.2 **Theoretical background**

2.2.1 ***Urban Settlements as Ecosystems***

Over the years, many academic currents emerged in attempts to frame and explore territorial innovation and regional development from different perspectives, such as *milieu innovateur*, industrial districts, regional innovation systems, among others (for evolutionary details, see MOULAERT; SEKIA, 2003). Most recently, we observe an increasing adoption of the ecosystem taxonomy, initially introduced by James F. Moore (1993), drawing on interdisciplinary insights from the anthropology and biology fields. According to the author, the rationale behind the lens is that organizations in a particular ecosystem coevolve capabilities working in the dynamics of coopetition (cooperation and competition, concurrently) to meet customer needs and incorporate innovations.

The presence of the word ecosystem in the title or abstract of top journals has increased sevenfold in the past few years (JACOBIDES; CENNAMO; GAWER, 2018), also leaving a debate over its adoption (OH et al, 2016; RITALA; ALMPANOPOULOU, 2017). Central to the discussion is the fragmented adoption of the taxonomy. In this regard, M. Phillips and Ritala (2019) advocate a more structured agenda based on: conceptual (ecosystem perspective and boundaries), structural (hierarchy of actors and the relationships between them), and temporal (dynamics over time) dimensions.

From the urban perspective, nascent ecosystems represent a timely line of inquiry for current discussions. Urban settlements are expected to account for the future growth of the world's population (UNITED NATIONS, 2018) and "are at the heart of global change" (ACUTO; SUSAN, 2016, p. 873). Urban patterns, technological changes, and demographic shifts have long called the attention of scholars to the need for strategic planning (KEMP,

1990; SZEKELY, 1992). Such a context imposes challenges for city-centric interventions and strategies to achieve social equity and ecological effectiveness (WACHSMUTH; COHEN; ANGELO, 2016). The maintenance of this particular ecosystem is per se challenging, as it involves complex dynamics among private and public actors, universities, and civil society with coopetitive socio-economic and sociopolitical goals, expectations, and behaviors (CARAYANNIS et al., 2018).

When it comes to the structural dimension, ecosystem also refers to "the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize" (ADNER, 2017, p. 42). By offering this definition, Ron Adner calls the attention to elementary components necessary to study ecosystem strategy: (a) positions and flows of activities among participants of the ecosystem; (b) sets of relationships beyond bilateral interactions; (c) sets of partners with a joint value creation effort; and (d) value proposition as the unit of analysis. Value proposition, here, denotes "the promised benefit that the target of the effort is to receive" (ADNER, 2017, p. 43), and the ecosystem must balance a certain level of divergence and deliver the promised value; nevertheless, how such dynamics occur in urban ecosystems?

In this regard, we must address fundamental elements and concepts from the urban development and planning literature: ideologies and storytelling. Ideologies produce and mobilize ideas and values to legitimize powerful interests (EAGLETON, 1991). Thus, ideological assumptions, mainly in collaborative planning, brings the "idea of how the world ought to be" (BRAND; GAFFIKIN, 2007, p. 288). Likewise, de Certeau (2002) links stories to spatial practices, in which stories "organize places through the displacements they 'describe'".

Addressing ideologies and stories is important because there is also an increasing discussion of their persuasive power in the construction of a web of relationships concerning city administration and public domains (SÖDERSTRÖM et al, 2014; ZANOTTO, 2020). When exploring the genesis of a collaborative urban ecosystem, we must recognize the forging of alliances and relationships, and its intrinsic political nature; these insights have been neglected by current ecosystem strategy literature due to its excessive focus on orchestration approaches stemming from the strategic management tradition (AUTIO; THOMAS, 2019). By incorporating these concepts, we not only contribute to the literature on ecosystems but we also aim at adding to a gap in storytelling in situ on an ongoing

mobilization (VAN HULST, 2012). Finally, by adopting the actor-network theory, we widen the possibilities of identifying serendipitous discoveries by following a local movement since its genesis, and we explore the agency among all sorts of (human and non-human) actants, also called by strategy-as-practice scholars (CARTER; CLEGG; KORNBERGER, 2008).

2.2.2 *Actor-Network Theory*

The actor-network theory (ANT) has its origins in the socio-technological field as a way of exploring the sociological dimensions of technology (CALLON; LATOUR, 1981). Rather than a theory, ANT is an approach to assist in the investigation of how actors, ideas, and social arrangements are shaped and become connected over time (CZARNIAWSKA, 2017a).

ANT is an ecological critique on modernistic reductionism and, therefore, could serve as a helpful vessel for organizational ecosystems studies that do not derive from business logic and corporate strategizing. In this regard, ANT presents two fundamental concepts to study processes: inscriptions and translations. The former refers to "types of transformations through which an entity becomes materialized into a sign, an archive, a document, a piece of paper, a trace" (LATOUR, 1999, p. 306). Hence, actors participating in the development and diffusion of new technologies embody (or inscribe) artifacts with intentions and constructed hypotheses (CALLON, 1987).

Translations, on the other hand, refer to the process of negotiation, mobilization, and displacement between actors, entities, and places, involving both the endeavor and outcome of aligning the interests of multiple actors beyond organizational boundaries (PIPAN; CZARNIAWSKA, 2010). On this matter, the seminal work of Michel Callon (1984) presents four main stages within translation processes: problematization, interessement, enrollment, and mobilization. During these four stages, actors: recognize a problem, convince others to become indispensable, and define the obligatory passage point (OPP) for the actors to pursuit their aims (problematization); strive to interest others agents and stabilize their identities (interessement); negotiate the role of participants as they involve in trials of strength (enrollment); and stabilize the network forging durable relations (mobilization) (CALLON, 1984; WÆRAAS; NIELSEN, 2016).

Entities enlisted during translation might agree to integrate the network or refuse the transaction by claiming different interests or orientations. This reasoning resembles the complexity of the "open boundary" rationality (also present in ecosystems) as actors may join or leave without predictability (ANDERSON, 1999). (M. Phillips & Ritala, 2019) argue that measures of centrality cannot fully attain the development of relationships or the heterogeneity of actors within ecosystems also often assumed to be homogeneous in most studies, which can compromise contributions as actors become 'nodes.' Also, as boundaries are somewhat blurry when it comes to ecosystems (AUTIO; THOMAS, 2014; VARGO; WIELAND; AKAKA, 2015), ANT is useful in accounting for these shortcomings as it traces different clusters of power and legitimacy without assuming upfront the nature (and hierarchy) of what is assembled (LATOUR, 2005).

Urban development literature generally addresses dynamics with high complexity of actors socially interacting while spatially distributed (CVETINOVIC; NEDOVIC-BUDIC; BOLAY, 2017; MONTERO, 2018). In this account, scholars have increasingly adopted ANT to dig deeper into the complexities of global challenges comprised of inter-organizationally-arranged and socially-oriented undertakings (e.g., CORBETT; MONTGOMERY, 2017; LEE; OH, 2006). Finally, ANT can be a powerful instrument for also contributing to the strategizing and organizing perspectives, as it scrutinizes artifacts and symbols affording the actual practice of strategy making and its legitimization (CARTER; CLEGG; KORNBERGER, 2008).

2.2.3 *A practice perspective on strategy and wicked problems*

The practice turn in social theory has inspired a growing mobilization in scholarly communities towards exploring situated practices, actions, and interactions in the strategy-making process (JARZABKOWSKI; BALOGUN; SEIDL, 2007; WHITTINGTON, 2006). This stream of studies is generally labeled Strategy-as-Practice (SaP) and understands "practices" as "accepted ways of doing things, embodied and materially mediated, that are shared between actors and routinized over time" (VAARA; WHITTINGTON, 2012, p. 287). In this regard, strategy work (or strategizing) goes beyond serving as an attribute of firms also to incorporate activities carried out by people (CARTER; CLEGG; KORNBERGER, 2008).

Despite having a common concern with addressing practices, this body of research has adopted a variety of theoretical perspectives to guide inquiries and interpret findings according to particular vocabularies of the practice theory applied, ranging from Foucauldian discourse analysis to the sociology of technology, among others (VAARA; WHITTINGTON, 2012). In the present work, we draw on the theoretical practice approach of Theodore R. Schatzki (2002, 2005), also adopted elsewhere (e.g. ANTONOPOULOU; BEGKOS, 2020; JØRGENSEN; MESSNER, 2010) and advocated as "one of the strongest and far-reaching versions of practice theories available to date" (NICOLINI, 2013, p. 15).

According to (Schatzki, 2002, p. XI), "to theorize sociality through the concept of a social site is to hold that the character and transformation of social life are both intrinsically and decisively rooted in the site where it takes place." In this regard, the site of the social comprises practices and material arrangements; the latter as set-ups of human beings, artifacts, and things (SCHATZKI, 2005). To study practices, (SCHATZKI, 2002) suggests four elements to which these organized activities are interlinked, namely: practical understandings, general understandings, rules, and teleoaffective structures. Practical understandings refer to particular abilities related to actions, or "knowing how to X, knowing how to identify X-ings, and knowing how to prompt as well as respond to X-ings" (SCHATZKI, 2002, p. 77). By contrast, general understandings are elements tied to the site of the practice, and thus common to practices of the particular site (JØRGENSEN; MESSNER, 2010); "Pervasive understandings of this sort are expressed in the manner in which people carry out projects and tasks" (SCHATZKI, 2002, p. 86). Rules guide organized actions as they refer to "explicit formulations, principles, precepts, and instructions that enjoin, direct, or remonstrate people to perform specific actions" (SCHATZKI, 2002, p. 79). Finally, teleoaffactive structures combine the defined goals and ends of a practice interwoven with emotions and mood.

Scholars have pointed to overlooked issues within SaP studies regarding: agency the becoming of strategists, the role of materiality, and the links of strategy and power relations (CARTER; CLEGG; KORNBERGER, 2008; VAARA; WHITTINGTON, 2012). Furthermore, SaP research have not fully covered emotional accounts (BURGELMAN et al., 2018), which is particularly problematic when it comes to exploring unexpected challenges and wicked problems. The concept of wicked problem was introduced by (Rittel & Webber, 1973) referring to issues emerging in social contexts generally involving complexity,

disagreement among stakeholders, also not having a definite resolution. Although strategists cannot completely solve wicked problems, they "can learn to cope with them" (CAMILLUS, 2008, p. 102). Hence, we believe SaP can shed light on alternatives to strategize in complex environments such as urban ecosystems, which is fertile territory for the emergence of wicked problems spanning organizational boundaries, given the multiplicity of agents with divergent priorities. By combining the ANT and Schatzki's practice theory, we provide a means to tackle these issues and determine how diverse mechanisms come together as different actants navigate in the creation of a collaborative urban ecosystem.

2.3 **Method and setting**

This study aims at extending theory using contextual explanations through an in-depth case study (WELCH et al., 2011). In this regard, qualitative research is particularly suitable and favorable in the early stages of theorizing as it provides open-ended data, and allows detailed analyses of complex processes involving temporal dynamics and causal mechanisms (GRAEBNER; MARTIN; ROUNDY, 2012; LANGLEY, 1999).

To allow theory extension, the present study links strategizing and organizing practices (microprocesses) to their performative effects (macro-outcomes) through an instantiation strategy (KOUAMÉ; LANGLEY, 2018), and we strive to explain their influence (over time) using the causal mechanisms rationale (HEDSTRÖM; SWEDBERG, 1998). In what follows, we present the case under study, as well as the data collection and analysis processes.

2.3.1 ***Research site***

Our case of inquiry is a nascent collaborative urban ecosystem in the city of Porto Alegre, in Southern Brazil. The case was chosen by theoretical sampling (EISENHARDT; GRAEBNER, 2007) due to its suitability for shedding light on relationships and constructs within the research aims.

Porto Alegre is the capital of Rio Grande do Sul State, which stands out by ranking fourth in the Brazilian GDP and is home to 25 higher educational institutions (CDT/UNB, 2014). Its capital, Porto Alegre, ranks seventh among the best 32 Brazilian cities for entrepreneurs and has a bit more than 1.4 million inhabitants (ENDEAVOR, 2015; IBGE,

2010). Despite these commendable figures and ranking, the city has been experiencing unfortunate challenges as poverty and violence have reached alarming rates (STARGARDTER, 2018). Such indicators have discouraged investors and propelled a local brain drain. As a result, Porto Alegre has lagged behind other Brazilian capitals recently recognized for their innovative and entrepreneurial environments, such as Recife (FEFERMAN, 2014) and Florianópolis (YIGITCANLAR et al., 2018).

In this context, three local (public and private) universities—UFRGS, PUCRS, and UNISINOS—led a mobilization to act upon this scenario. These universities stand out among other Brazilian universities in varied rankings. According to the National Institute for Educational Studies and Research (INEP), UFRGS is among the best ranked Brazilian universities regarding INEP's overall index of courses, placed second in the 2018 report (INEP, 2019). UFRGS's scientific impact is also acknowledged in the 2019 CWTS Leiden Ranking as the fourth university in Brazil (CWTS, 2019). On Scopus, the three universities account for more than 70 thousand publications (as of February 2020). Finally, the universities are home to major Science and Technology Parks; two of them (Tecnopuc and Tecnosinos) are room for global companies (such as HP, SAP, and Oracle) and were recognized as the best national Science and Technology Parks (ANPROTEC, 2016).

In 2018, these universities forged the Alliance for Innovation (hereinafter, the Alliance) to join efforts to develop human capital and advance scientific and technological knowledge. Later that year, the Alliance, along with the local city council, articulated a pact dubbed Pacto Alegre (hereinafter, the Pact) to boost local development by identifying and discussing current challenges and delivering projects through collaborative efforts. To execute the Pact, the Alliance relied on a European consultancy with previous experience in similar endeavors by Barcelona (Spain) and Medellin (Colombia), both cities benefiting from innovative transformations (c.f. BAKICI et al, 2013; FERRARI et al, 2018).

Data collection started in early 2019, when the Alliance and the city council contacted several entities and developed an executive board to define the Pact's macro-challenges according to social, economic, urban, and governance axes. Throughout the year, these six macro-challenges were broken down into 24 projects[3] brainstormed and conducted by

[3] The full list of the 24 projects (and their description) can be found in Appendix A. Subsequent events and translations led to transformations (such as elimination, merges, and inclusion of new projects) that can diverge with the Pact's official website. Some of these transformations are discussed in the paper.

multiple groups of interdisciplinary agents from the most varied sectors. All projects should provide deliverables to the city by December 2019. After this stage, the authors followed the actors and collected data up until March 2020. Figure 1 illustrates the central undertakings during the initial stages of the Pact.

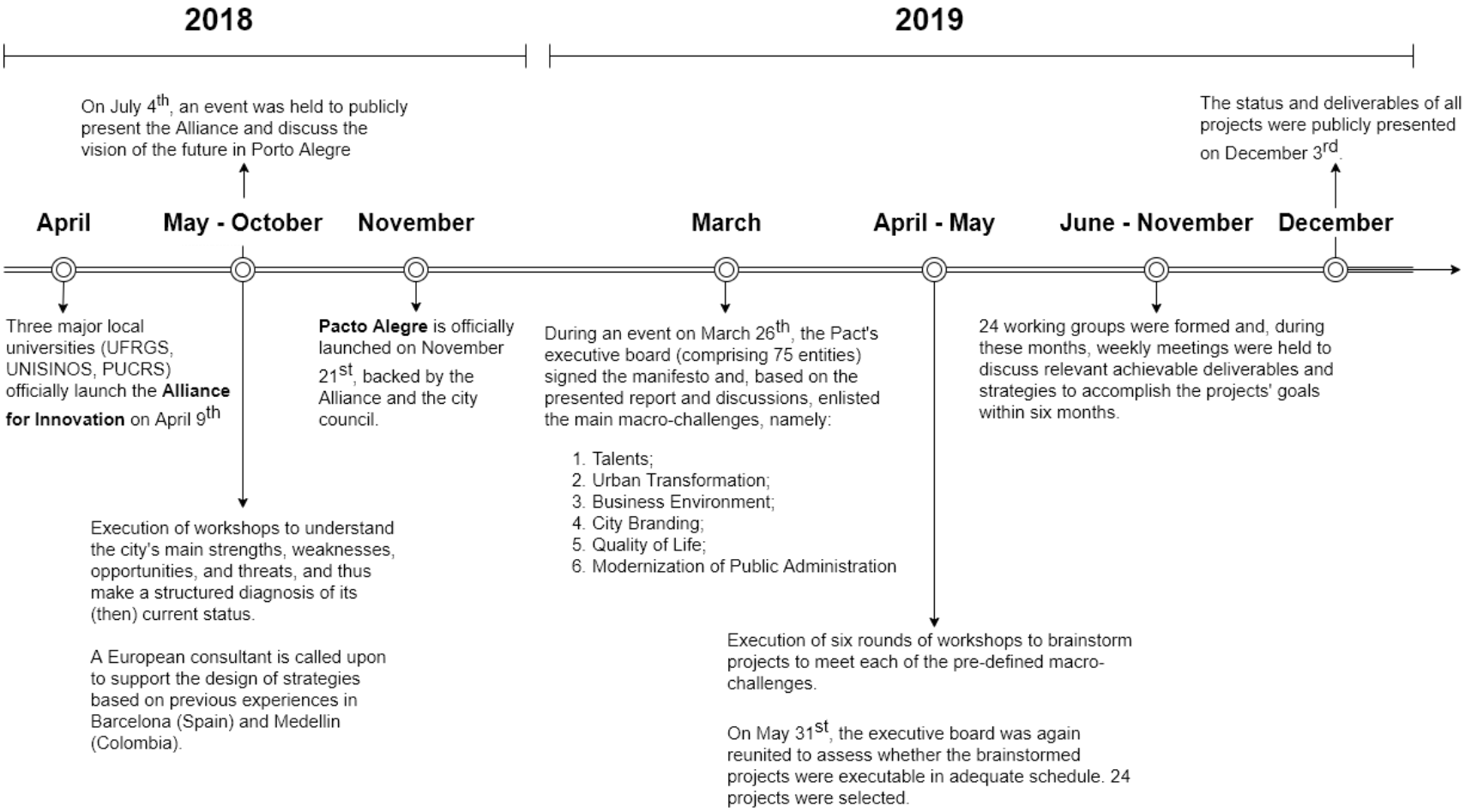

Figure 1. Representative timeline of the Pact's initial stages.

2.3.2 *Data collection and analysis*

To explore the genesis of a collaborative ecosystem, we departed from the symmetrical ethnology (CZARNIAWSKA, 2017b) based on the process approach (MILES; HUBERMAN, 1994). By adopting such a symmetry, we are in line with ANT assumptions to not differentiate human and non-human actants, and we strive to bring interest to artifacts in the practice of strategizing and organizing (CZARNIAWSKA; MOURITSEN, 2009). Additionally, we relied on an interpretive case study approach (CORLEY; GIOIA, 2004; WALSHAM, 1995), since we aimed at understanding a specific reality and giving voice to those living such a new experience.

From February 2019 to March 2020, the fieldwork was mainly conducted by the first author as an observant participant (HONER; HITZLER, 2015), actively participating in as many undertakings as possible, also taking field notes and following the objects (CZARNIAWSKA, 2008; LATOUR, 2005) under investigation. To enhance critical assessments of interpretation, a second author also participated in some activities, and all authors of the paper were involved during data analysis.

The authors were afforded privileged access (YIN, 2014) to meetings, workshops, and project kickoffs. The immersion also poses as a valuable strategy in such a case with limited knowledge concerning this particular phenomenon (SIGGLEKOW, 2007). To understand the development of the collaborative ecosystem, we drew upon three sources of data:

- ***Observation***: The authors visited the official announcement of the executive board formation and the macro-challenges that would guide the following stages. The authors attended the six brainstorming workshops, the meeting in which the executive board assessed and voted for the projects (May 31st, 2019), and the succeeding projects' kickoffs. Finally, the first author also followed the development of one of the projects throughout the second semester and followed instant messaging groups comprised of members discussing the development of activities and deliverables to the city. Considering the multiplicity of actors under investigation, adopting a digital platform facilitated the observation of discussions emerging naturally. The first author

also attended the presentation of the projects' deliverables in December 2019. During all visits, field notes were taken on debates and insights emerging in the events.

- ***Archival material***: the Pact's steering committee generously granted access to over 1,600 official documents, including PowerPoint presentations, invitations, and meeting minutes, which we analyzed to understand the assumptions behind it (CALLON; LATOUR, 1981). We drew on the documents to follow the actors (LATOUR, 1984) as they forged associations.
- ***Interviews***: To complement the observations and archival materials, the authors conducted 19 interviews with representatives of entities serving the steering committee, the executive board, the city council, and participants joining the development of the Pact's projects (18 respondents). Interviewees included the coordinator of the Pact, the mayor, representatives of banks, non-governmental organizations and other entities, and the secretary for Science, Innovation and Technological Development of the Rio Grande do Sul State. The interviews lasted between 30min and 1h20min, and focused on understanding how the actors (were) engaged into the ecosystem, their roles, also identifying personal and political interests, and convergent/divergent arguments concerning the Pact.

For the analysis, the authors followed the recursive pattern of interpretive research (YANOW; SCHWARTZ-SHEA, 2006), returning to the data several times throughout the data collection, with multiple readings of field notes, interview transcripts, and documents. The authors interviewed participants continually, concurrently comparing the information from official documents (e.g., invitations, meeting minutes) and field notes from participant observations.

The analysis comprised four main stages. First, the authors transcribed the interviews, read, and coded all materials. We studied the transcripts to identify the strategies involved during the initial contacts to forge alliances and the narrative behind it. The interviewees' responses were cross-checked with the archival material using the triangulation strategy (YIN, 2014).

The second stage focused on understanding how the actors' enrollment into the collaborative ecosystem was secured, also identifying potential conflicting perspectives. For this stage, we relied on the coded field notes and interview transcripts. As we conducted

interviews continually, in cases of observed divergence, we contacted and interviewed participants and members of the steering committee (individually) to identify and contrast conflicting opinions and strategies. Then, all interviews were again coded and analyzed regarding how controversies had emerged and whether they had been resolved.

In the third stage, we adopted the temporal bracketing strategy (LANGLEY, 1999) to decompose the data into Callon's (1984) four stages of translation. We acknowledge that translation may involve more than these four steps due to the complexity involved in such a phenomenon, and we use it as an analytical heuristic (WHITTLE; SPICER, 2008). Thus, we organized data considering the four stages, providing an examination of how actions evolved over the periods and led to subsequent actions, but we also acknowledge further undertakings. We examined how the actions and artifacts were connected during the genesis of the ecosystem and how they contributed to the translation.

In the fourth stage, the authors identified the recurrence of mechanisms drawing on the notion of the transformational mechanisms (HEDSTRÖM; SWEDBERG, 1998; HEDSTRÖM; YLIKOSKI, 2010). Here, the aim was to detect and understand the underpinning strategic actions and interactions among (human and nonhuman) actants forging alliances and managing wicked problems. The authors turned to Schatzki (2002) theoretical lens as a sensitizing concept (NICOLINI, 2009; WALSHAM, 1995) after considerable time iterating between concepts from the literature and the empirical material. We intended to identify the elements related to the practice of strategizing an urban ecosystem, and we clustered the elements under four high-level categories that emerged from the analysis, namely: legitimizing leaders (general understandings), steering ideologies (teleoaffective structure), foregrounding the strategic discourse (rules), and sustaining expertise (practical understandings). Table 1 summarizes the main stages of the data analysis process.

Tabe 1. Data analysis

Stage		Activity
Coding events	I.	Building a temporal bracketing strategy of events according to the four stages of translation (CALLON, 1984; LANGLEY, 1999).
Thematic analysis	I.	Identifying local mechanisms using the transformational mechanisms rationale; (HEDSTRÖM; SWEDBERG, 1998; HEDSTRÖM; YLIKOSKI, 2010);
	II.	Drawing on Schatzki's practice theory as a sensitizing concept for the (conceptual and empirical) appraisal of the identified mechanisms;
	III.	Exploring the relationship among the mechanisms and across the four stages of translation, and identifying a pattern of mechanism usage.

2.4 **Forging an urban collaborative ecosystem**

2.4.1 ***Problematization and the Alliance for Innovation***

Since the 1990s, Porto Alegre has experienced many initiatives to boost synergies among their local agents and foster innovative environments, such as the RS Tecnopole and the CITE (an acronym for Community, Innovation, Technology, and Entrepreneurship), both inspired in worldwide experiences such as the French technopoles and the Silicon Valley. These past experiences in the city involved some local actors of the triple helix—academia, industry, and government—and usually entailed benchmarking visits and the creation of innovation centers and agencies. Despite some advancement, these undertakings lost strength over the years[4].

In 2017, a new administration took over the city council and structured an innovation board with key agents from the business community and the local ecosystem to discuss plans to foster innovation in the city. At this moment, no strategy had been designed, but meetings were held to discuss possibilities. Central to the discussions were the challenges faced by the city administration concerning the increasing perceived brain drain and violence rates, and the fear of its continuous loss of competitiveness.

[4] A historical summary can be found at https://pactoalegre.poa.br/como-chegamos-ate-aqui

Concurrently, the three local major universities (UFRGS, PUCRS, and UNISINOS) articulated a collaborative alliance to boost entrepreneurship and innovation development by joining their individual competencies regarding scientific production and innovation environments. Despite this common objective declared by the Alliance, this articulation had another goal:

> *Why was the Alliance created? It was not only created for the innovation side, but it was also created because we needed it to be on the board, to be the ambassador for the cause, and we had much discomfort to start a government-led undertaking [...] And then came to us [the innovation board] the idea of the Alliance, the three universities, not one single university, and that's also why the Alliance happened, to be the leader of a coming project [...] Government administration changes, but universities are long-lasting institutions.* (innovation board member)

As the innovation board meetings were held and the Alliance emerged, the universities and local agents referred to recent undertakings held in Barcelona and Medellin and set those mobilizations as potential targets to which Porto Alegre could aim to enhance its competitiveness. A European consultant experiencing those foreign mobilizations emerged as a neutral tutor to guide the local actors in designing the strategies.

At this stage, the actors agreed that the main scope of the mobilization should be extended to address issues beyond entrepreneurship and innovation development. The actors, then, advocated the pursuit for a collaborative urban ecosystem, in which: the universities would advance knowledge, the city council would stand out as a reputable administration, the business community would have a more attractive business environment with talented professionals at disposal, and the consultant would enjoy another successful undertaking. The actors recognized that their association would benefit each of them. Nevertheless, only a few agents have been involved so far for such a great objective that would entail a comprehensive urban development.

2.4.2 *Inscribing an interessement device: the Pact*

The consultant suggested the proposal of a local pact among all actors of the city to develop city-centric projects. Before that, the Alliance realized they should first understand the (then) current strengths, weaknesses, opportunities, and threats of Porto Alegre, and professors from the three universities carried out a comprehensive analysis of the city. The professors produced a report based on several indicators from reputable sources and interviews, identifying key areas requiring attention, and presented the report for the city council and members representing the business community. With a better understanding of the setting, the Alliance advocated the Pact should be crafted to represent a comprehensive project in which the whole society should enjoy clear benefits. Following ANT, Figure 2 illustrates the obligatory passage point (OPP) providing actors an alternate path to avoid obstacles, and the raise of the Pact as an additional entity, to which the actors would turn to pursue their goals.

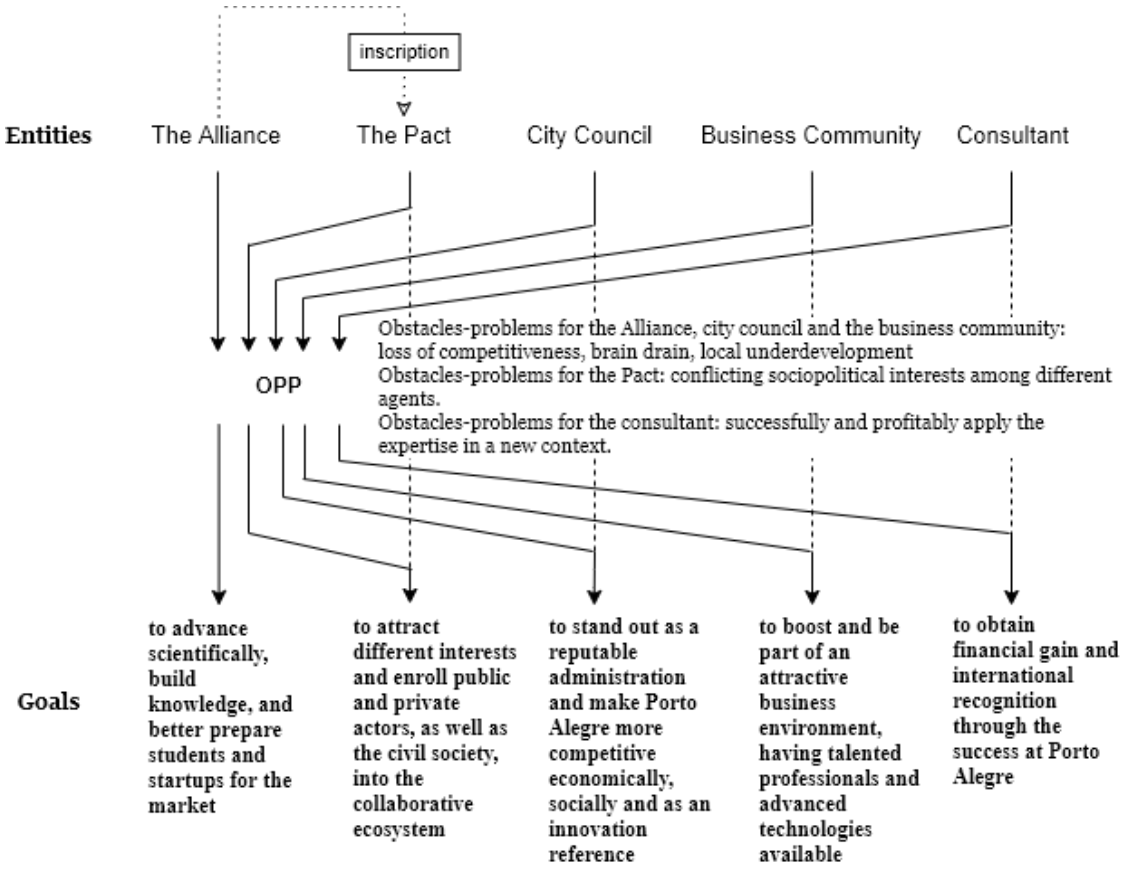

Figure 2. The creation and inscription of the Pact in the problematization. Inspired by Callon (1984)

The consultant, as well as key members of the Alliance and the city council, identified fundamental entities in the city that would have the influence to put actions into effect, and they reached out for those companies and city representatives to join the mobilization as members of an executive board. Texts and a narrative strategy afforded the Alliance additional persuasive power.

> *We explained the historical context, the need and desire to do something for the city, the concern about seeing our capital declining. [...] From the diagnosis (the report), we revealed some good and bad indicators, which supported and justified our efforts to do something different.* (the Alliance representative)

Actors representing the Alliance contacted the entities and personally visited their offices, showing presentations and data from the report. Despite the comprehensiveness of the Pact, the initial innovation-oriented objective was never left behind and served as an underlying narrative. Presentations revealed data of the city's innovation ecosystem, bringing and comparing numbers of accelerators, incubators, investors, startups, science and technology parks, among others. Also, in the presentations, Barcelona and Medellin were presented as benchmarks to which the mobilization should target, continually referring to the term "smart city."

> *We were careful enough to visit and listen to each entity, show our ideas, and show them that without innovation, there was not many solutions for the city.* (The Alliance representative)

The entities were invited to collaborate in the design and execution of projects for the city. The collaboration would entail contributing financially or providing individuals (employees) to co-create and execute projects, whichever way they could and wished to collaborate. The entities had no strict obligations, but to sign a public manifesto showing interest to being a member of an executive board:

> *We are a movement that seeks to transform Porto Alegre into a reference as a world-class global innovation ecosystem that leverages our skills, based on values and purpose that*

> *retain and attract talents. We come from the organized civil society of our city, involving entrepreneurs, academics, citizens and public actors concerned with the future. We base our action on creativity, new technologies and innovation, having people as agents of transformation of society, with high social and environmental impact, and of business, from startups to large companies. We cooperate and act TOGETHER in building an inspiring environment that contributes to the creation of a better future for our city and for the people who are part of it.* (The manifesto; authors' translation)

The statement was designed in such a way that the innovation held centrality in the mobilization, and all actors could see that participating would serve their own interests. Seventy-five entities—including banks, hospitals, industrial associations, local media, and non-governmental organizations—signed the manifesto and joined the Pact. The announcement of the Pact (and signature of the manifesto) took place during the 247th anniversary of Porto Alegre. The planning and execution of the projects followed this stage.

2.4.3 ***Enrollment and the rise of trials of strength***

Right after the announcement of the executive board and signature of the manifesto, actors were called upon to engage in several workshops to brainstorm projects for the city. Six ideation workshops were held, each one assigned to one of the six macro-challenges identified within the report (Figure 1).

For the workshops, the steering committee invited actors based on their interests and familiarity with the themes, involving representatives from the executive board and referred individuals from the civil society. Throughout the execution of the workshops, some participants raised concerns regarding a perceived lack of diversity. During the workshop for the Urban Transformation project, one participant questioned the committee about the exclusiveness of white participants debating strategies for the city. Such discomfort was also shared by other participants of different workshops.

> *I was shocked to see unqualified people talking about the quality of life. […] The universities have qualified people and intelligence to address environmental and social themes and I don't think this intelligence is joining the Pact, not on that day. […] We need the Pact to be*

more inclusive. There were a lot of people there who were simply giving their opinions and guessing […] what the upper-middle-class wanted and what is most important to them prevailed. (Participant in the Quality of Life project)

I didn't get to participate in other previous projects [RS Tecnopole and CITE], but, to be honest, I have some issues with the Pact. I think it is nice to involve a lot of people, but I can't get enough of saying that all the Pact meetings are 100% white people, I bet everyone is upper-middle-class, and you may see only two or three women, at most. I do not believe this is a representation of the people of our city. (Business community representative)

As a response, the steering committee often promptly replied that such a stage only represented a starting point for the Pact. Despite some members of the steering committee acknowledging the gap, the discourse was not consensual.

I think it is a real observation [lack of diversity]. [...] this is work in progress, we will have shortcomings, advances, and setbacks, this is natural in the game, but everyone must call attention, it is important that, as long as someone feels minimized, excluded, inferior, deprecated, that someone says it out loud. […] We need to bring these wounds to the surface so that we can empathize. (Steering committee representative)

If we think about the development of a policy that affects pregnant women, for instance, these pregnant women do not need to be involved during the making of such a policy, but people who work with this public and who have the scientific qualification to reach them, and who are sensitive to their context. (City council representative)

The workshops resulted in 24 projects collectively constructed among the participants. These projects were presented to the executive board in an event, in which representatives from the board assessed the projects and voted how they believed they could collaborate to the projects by straightforwardly joining a project or promoting/sponsoring it.

After the event, 24 groups were created to execute the projects and provide deliverables within six months. At this stage, each project had its particular aims and goals, and the participants developed strategies to achieve them. This time, in attempts to address the issue of diversity, some groups conducted interviews to gather perceptions of inhabitants

from peripheral neighborhoods. Nevertheless, other sorts of controversies arose, and not all projects provided deliverables.

Some participants refused the transaction by not attending the execution of the projects over the weeks. The mediators (from the steering committee) attributed the abandonment of some participants to the lack of perception (by those individuals) as to the overall importance of those projects. Other participants manifested questions, negotiations, and rejections (CALLON, 1984):

> *[What caught my attention in the Pact was] the dynamics of collective creation, the idea of participation without political bias. [...] I realized the project became a platform where the idea was to talk about things that could be used by the city council, and the initial idea was to build a project for the city. The initial idea was: let's bring the population to the streets! The idea became: the public entity sponsoring or encouraging people to go to the streets, as a leader instead of the Pact, the collective.* (Participant of the project Moving around with POA)

> *I think the project started very well; everyone was very well-intentioned. Then, other people, who were not in the beginning, started to join the project and I got upset with a decision that was made. We wanted to involve graffiti artists from the 4D (a local region), because the idea was to revitalize the region. The idea was to involve local graffiti artists, develop workshops with local people to promote the place. But then I was told they were going to hire a famous painter from São Paulo who is not even a graffiti artist. They're going to pay lots of money to the painter. That's not what I came here for. What did they do all this for? Why didn't they hire the painter in the first place?* (Participant of the project 4D Hands-On)

In December, the status of all projects and their deliverables were openly presented to the city. Of the 24 projects, eight held a status of in progress with a green sign, twelve were in alert followed by a yellow sign, and four held a status of in delay with a red sign. Participants presented the projects they developed throughout the months. Some projects were displayed followed by press news promoting the Pact and showing the visibility received.

2.4.4 ***Mobilization***

As we saw previously, during the ideation workshops and execution of the projects, some participants questioned the intentions behind the Pact and its reach. Nevertheless, in the final event, individuals were considered to be the official representatives of all the involved actors and the masses they claimed to represent.

During the event, members of the business community, city council, the Alliance, and civil society discussed a few tables and numbers committing populations of silent actors represented by those individuals. Thus, following (Callon, 1984), these populations have been mobilized. The emergence of previous controversies and the delay of some projects were rejected using a narrative logic within innovation:

> *We are adopting the startup logic; we do not spend too much time planning. Instead, we test our product, and we pivot it whenever necessary, a sort of agile development.* (Steering committee representative)

> *It is absolutely expected that we try many things, that we make a lot of mistakes trying to get it right; we will make even more mistakes; this is part of the innovation model. [...] The more failures in the past, the easier it is to get it right forward, this is the culture of innovation: 'fail fast, learn faster' [...] there is no problem in making mistakes, there is a problem in no making such mistakes fast.* (Business community representative)

The Pact evolved after the event. The Pact's official website now displays additional ongoing projects happening in the city, whether originally from the city council, any of the universities, or from unrelated individuals. According to the steering committee, the intention is to boost positive initiatives already happening in the city by adding support from the Pact.
The execution of the projects continues with the support of individuals to provide more deliverables at a faster pace. The Rio Grande do Sul State started a similar project; the idea is to take advantage of the engagement and buzz from the Pact to interest several actors to foster innovation throughout the whole state[5].

[5] For further information, see https://www.inova.rs.gov.br/programa-inovars

2.5 **Strategizing mechanisms**

Our analysis revealed some underpinning dynamics in the creation of a collaborative urban ecosystem as actors strived to ignite a comprehensive mobilization and strategize wicked problems. The examination of our empirical material shows the emergence of four mechanisms put forth throughout the translation process, namely: (a) legitimizing leaders, (b) sustaining expertise, (c) steering ideologies, and (d) foregrounding the strategic discourse. Next, we present a detailed analysis of each mechanism identified using Schatzki's (2002) practice theory as a sensitizing concept. Table 2 summarizes the underpinning mechanisms, and Figure 3 depicts the chronology of key events and the relationship among the mechanisms throughout the four stages of translation.

Table 2. The mechanisms supporting the genesis of the collaborative urban ecosystem

Mechanisms	Brief description of Schatzki's theoretical elements	Explanation and representative illustrations
Legitimizing leaders	General understandings and shared beliefs with less disagreement about.	The universities assume the leading position despite the city council having triggered the mobilization. *"…the universities had the power of having positive visibility from the society, seen as agnostic institutions, so to speak, who wanted the common good, we were also able to interest several actors who shared this desire for the common good and who supported us from the beginning."* (the Alliance representative)
Sustaining expertise	Practical understandings and abilities related to the actions of a practice.	The universities were involved in previous undertakings, some leaders visited global benchmarks, and an international consultant would provide the expertise for the local transformation. *"I am a tutor, a neutral external agent who has had experiences in other pacts and who can provide to society a methodology on how to approach the Pact."* (the consultant)
Steering ideologies	Teleoaffective structures as the goals and ends, and the interrelated emotions and moods of a practice.	The goals are set on ideological values and beliefs, also shaping the motivations. "…*we have a very unique movement driven by the Alliance to build a city that will clearly become a reference in 10 or 20 years, a reference in innovation and a reference in terms of quality of life.*" (business community) *"…We cooperate and act TOGETHER in building an inspiring environment that*

		contributes to the creation of a better future for our city and for the people who are part of it." (the Manifesto)
Foregrounding the strategic discourse	Rules as precepts to guide actions, typically presented to bring new activities or regulate existing ones.	Leaders craft a compelling explanation to interest actors and stabilize controversies centered on the innovation. "*Innovation is not just about technology, to innovate would be to provide high-quality education, for example, to innovate would be to reduce costs, or to shorten queues in public hospitals ... all of this is innovation and it must reach everyone.*" (the Alliance representative) "*…this is the culture of innovation: 'fail fast, learn faster' [...] there is no problem in making mistakes, there is a problem in no making such mistakes fast.*" (Business community representative)

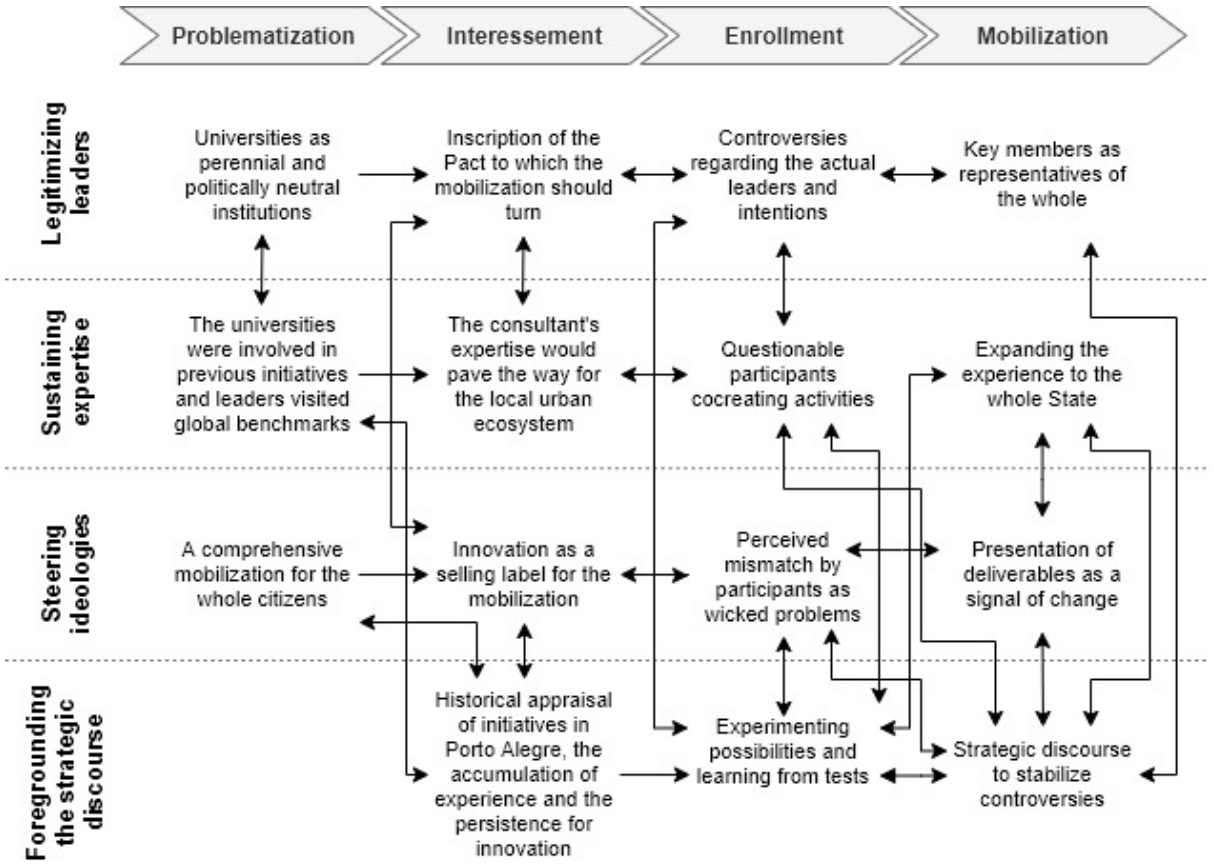

Figure 3. The chronology of events and relationships among the mechanisms.

2.5.1 *Legitimizing leaders*

The city council started the mobilization by structuring an innovation board and holding meetings to discuss a possible future undertaking. Nevertheless, participants felt that political leadership would compromise the perpetuity of the initiative, as well as its legitimacy by different sorts of stakeholders. Legitimacy, here, refers to the social acceptance of institutions or actions (ASHFORTH; GIBBS, 1990). On this matter, Brazil has gone through political tensions in the past few years (LONDOÑO; CASADO, 2019; PEARSON; ROSSI, 2016) and the Brazilian public universities have recently experienced police raids on campuses, politically-motivated budgetary cuts, and pressures from the federal government targeting the universities' autonomy and limiting academic freedom, which then propelled protests all over the country (PHILLIPS, 2019; SCHOLARS AT RISK, 2019). The choice of the Alliance to be the leader of the local endeavor represents (mainly in the Brazilian context) a significant indication that people still rely on science as the most convincing tool to persuade others (LATOUR, 1983; LAW; LODGE, 1984) and to provide incremental sustainability to the mobilization.

In this regard, we observed constant attempts to attribute legitimacy based on common sense concerning the significant role of the universities, and thereby the legitimizing leaders mechanism is supported by general understandings and shared beliefs (SCHATZKI, 2002). Also, in the next moment, we noticed that by this mechanism, the Alliance (encouraged by the consultant) crafted the Pact as a neutral agent to which the mobilization should turn to accomplish their goals. The inscription of the Pact afforded the Alliance the ability of interesting—and controlling (LAW, 1984)—spatially-distributed agents. During the creation of the ecosystem, the inscription received human characteristics, often referred to as being socially-concerned.

2.5.2 *Sustaining expertise*

In addition to presenting the Alliance as a legitimate leader, individuals often substantiated their capacity to conduct this major undertaking. In this regard, contrary to the findings of (Kornberger & Clegg, 2011), the Alliance regularly brought the historical context of Porto Alegre and their involvement in past initiatives, as well as their participation in technical visits held in worldwide-known innovation ecosystems. Furthermore, the Alliance and the

city council referred to the external consultant as a knowledgeable professional who experienced successful mobilizations overseas, and who could provide developmental instructions for Porto Alegre to progress accordingly.

Following this rationale, the mechanism of sustaining expertise is underpinned by practical understandings and abilities related to the actions of a practice (SCHATZKI, 2002). The mechanism of sustaining expertise was highly interrelated with the legitimizing leaders mechanism (as depicted in Figure 3). The role of non-human actants was also fundamental. Based on the report structured by the Alliance, leaders built presentations revealing the potentiality of Porto Alegre in several domains, and how the city had the knowledge capacity to accomplish their goals. Visual displays of academic rankings, as well as awards and recognitions received by local agents, served as inscription devices (LATOUR, 1987) in the process of interesting agents into the collaborative ecosystem.

2.5.3 ***Steering ideologies***

The analysis showed the prominent role of ideologies in ecosystem development. The steering committee relied on the experiences held in Barcelona and Medellin and, in several discourses and presentations, the Alliance often adopted the concept of 'smart city' as a vision of the future to which the ecosystem should target. In this regard, scholars have disclosed how the concept of smart city can be used as a powerful tool to legitimize political discourses, and how the 'smartmentality' stratagem acts in the urban imaginaries (Söderström et al., 2014; Vanolo, 2014).

The continuous workshops, meetings, and official events can also be viewed as a strategy of storytelling in the ecosystem. The Pact was officially "born" on the same day of the city anniversary, also shaping the imaginaries of a myriad of actors so the whole city could celebrate the mobilization, and providing a sense of pride for the agents participating in the collaborative ecosystem. Hence, we observed the mechanism of steering ideologies is informed by teleologies (goals or ends) of a practice, and interrelated emotions and moods (SCHATZKI, 2002) (Table 2).

In our analysis, the mechanisms of legitimizing leaders, sustaining expertise, and steering ideologies had a fundamental role in interesting heterogeneous actors into the ecosystem. These particular mechanisms created a tension that led the actors to join the

ecosystem to reach their goals (LATOUR, 1987); nevertheless, they would not secure the participation alone, and a fourth mechanism was imperative in the following stages.

2.5.4 *Foregrounding the strategic discourse*

Finally, the steering committee often directed the attention of participants to the label of 'innovation,' whether as an end towards which the ecosystem should target, or as a means to achieve other comprehensive objectives (Table 2). Drawing on our analysis, the mechanism of foregrounding the strategic discourse is underpinned by the rules or "explicit formulations, principles, precepts, and instructions that enjoin, direct, or remonstrate people to perform specific actions" (SCHATZKI, 2002, p. 79).

The discourse of innovation and innovation-oriented practices not only assured the enrollment of different actors, but it also contributed to counteract eventual pitfalls. The steering committee relied on likely failures by adopting upfront the logic of business model experimentation for startup management (SILVA et al, 2020) so they could adequately make strategic adjustments whenever needed. Thus, whenever wicked problems emerged in the form of controversies raised by participants, the steering committee would provide a compelling explanation justifying actions as experiments (see RIES, 2011), and that such actions should not be seen as final, but as arrangements under improvement.

2.6 **Discussion and implications**

Drawing on the findings, our critical insight is that strategists maneuver micro-political dynamics in nascent collaborative urban ecosystems by adopting four mechanisms. Figure 4 depicts the conceptualization and illustrates the mechanisms underpinning the creation of a collaborative urban ecosystem throughout the process of translation.

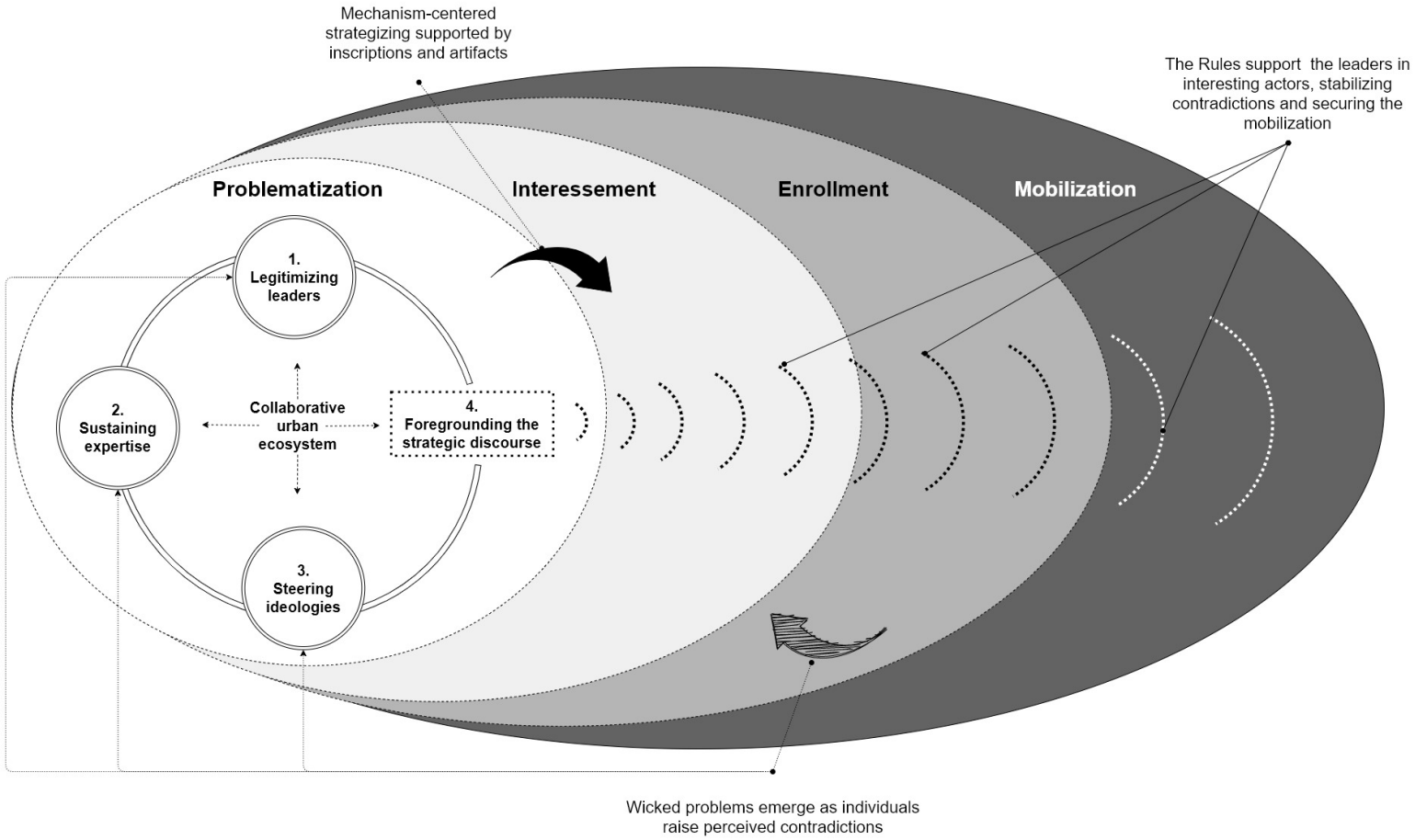

Figure 4. Strategizing a collaborative urban ecosystem as processes of translation and inscription.

We theorize that strategists ignite collaborative urban ecosystems by making use of the four mechanisms identified; these mechanisms are interconnected and provide a basis for the undertaking to start. Nevertheless, the mechanism of foregrounding the strategic discourse sustain the other three mechanisms and, as the initiative reaches other stages of translation, this particular mechanism "radiate outwards" (CHIA; RASCHE, 2010, p. 38) to tackle wicked problems.

Recently, authors focused attention on addressing ecosystems design, and strategies put forth in their nascent stages (DATTÉE et al, 2018; HANNAH; EISENHARDT, 2018). These studies contributed by disclosing coopetitive strategies and surrounding conditions under which ecosystem may be designed, but the relationships (of power) among stakeholders and their effects on the ecosystems' initial dynamics need further explorations. In this regard, our findings provide several contributions to the ecosystem strategy literature.

We introduce an emergent framework (Figure 4) that complements research on ecosystem strategies focusing on cooperation and value creation (ADNER; KAPOOR, 2010), but from an urban perspective. In doing so, we refine studies revealing the performative effects of strategizing (KORNBERGER; CLEGG, 2011; VAN DEN ENDE; VAN MARREWIJK, 2018) and we add by showing how some effects may be mobilized—mainly in urban settings—adopting the identified mechanisms.

Autio and Thomas (2019) recently called the attention to an over-emphasis on matters of governance and orchestration, and the authors (p. 14) argued this view may compromise identifying "the roles of generativity and emergence in ecosystem creation and evolution." Hence, our study does illustrate the prominent role universities may hold within ecosystems. However, it also reveals tensions and controversies arising as different participants co-create activities and negotiate the fate of the undertaking. Here, we make a case to show that politics and power are inherent features of ecosystem phenomena and should not be disregarded in research exploring ecosystem design (AUTIO; THOMAS, 2019; PHILLIPS; RITALA, 2019).

Following this rationale, most studies on ecosystems address inter-firm relationships creating and capturing value, also striving for new innovations (SCARINGELLA; RADZIWON, 2018) and, although some perspectives address the role of universities (e.g., CLARYSSE et al, 2014; WRIGHT et al, 2017), few studies explore how universities may

strategize in such ecosystems, mainly from the urban perspective. Although not initially intended, the universities became strategists as they mastered the inscription of the Pact, as well as adopted reports and presentations to interest heterogeneous actors into the ecosystem. These are significant findings, as we followed ANT and not assumed a priori who held such a status within the ecosystem, and we showed the role of non-humans involved in the process.

Additionally, the concept of 'smart city' was often mobilized to enroll and engage participants in the undertaking. This concept from the 'out-thereness' was translated to interest actors, but also faced 'in-here' issues (LAW, 2004) when met with the ideology of a comprehensive collaboration (BRAND; GAFFIKIN, 2007), which led some actors to raise concerns of cohesion and entailed renegotiations. These tensions revealed in the study contribute by showing how ecosystem stakeholders perceive value and retroact with other ecosystem constituents, an issue underexplored in the ecosystem literature (AUTIO; THOMAS, 2019).

By addressing these dynamics, we also provide a serendipitous account to ecosystem research: white participants raised discomfort regarding uneven racial and gender participation. The statement of the city council representative arguing that not all minorities should be necessarily present (but people sensitive to their needs) poses some shortcomings. A recent report released by the Brazilian Institute for Applied Economic Research reveals Porto Alegre holds the highest inequality between blacks and whites among 111 Brazilian municipalities (all capitals included) (IPEA, 2017). Lowery et al (2006) conducted experiments and showed that "even if all members of society successfully purged themselves of prejudice, full inclusion of minority group members in society may still be hindered by malice-free attempts to maintain the privileges that dominant group members have grown to see as their due." Additionally, in contexts of historical political subordination (such as Brazil), blacks should represent blacks, and women should represent women (MANSBRIDGE, 1999).

Participants raised several discomforts. Some of these were (somewhat) met, but others were silenced by claimed representatives during the translation stage of mobilization. Here, we show the importance of: (i) exploring emotions in strategizing and organizing processes (BURGELMAN et al., 2018); and (ii) disclosing the silences of strategy-making processes in practice (c.f. Carter et al., 2008) as strategists attempt to stabilize ideological controversies.

Revealing silences of strategy brings further implications to organizational studies and ecosystem development. Strategic practices serve to "include and exclude, legitimate and delegitimate, and even, potentially, to change the very concept of the organization itself" (VAARA; WHITTINGTON, 2012, p. 298). Thus, strategies like those of the Pact may lead to less (gender and racial) diversified ecosystems which, in turn, can entail in the creation of specific marginalized networks as alternate responses (MCADAM; HARRISON; LEITCH, 2019). In the case of entrepreneurial ecosystems, for instance, marginalized networks forged to countervail under-representation in mainstream ecosystems may lead to poor outcomes, since entrepreneurship is not an equalitarian activity (DY, 2020). Hence, studies exploring how these populations might strategize successful networks under such ecosystems are highly encouraged.

Finally, the present study provides a new theoretical approach to investigate ecosystems drawing from a practice perspective. We reveal the importance of delving into strategizing and organizing activities in ecosystem development considering conceptual, structural, and temporal dimensions (PHILLIPS; RITALA, 2019). Hence, we offer in-depth and empirically grounded insights regarding ongoing strategic works carried out by heterogeneous (human and non-human) agents in organized actions (SCHATZKI, 2002) that enable them to forge alliances, raise negotiations, and attempt to stabilize controversies (CALLON, 1984).

2.7 **Limitations and concluding remarks**

In this paper, our aim lies beyond disclosing the creation of projects and following their progress over time. By contrast, we explored a nascent urban ecosystem not considering hierarchies or types of relationships upfront, and we contribute by illustrating underpinning dynamics, arguments used to forge alliances, and how strategies are (re)designed in practice in attempts to stabilize controversies.

Like any qualitative research, this study is not free of limitations. By drawing on a single-case study, the design favors depth over generality and cannot be used for generalization. Nevertheless, ANT warns that all innovative undertakings are 'local', and empirical investigations should explain the creation and maintenance of uniformities, which should not be taken for granted (NICOLINI, 2010). Likewise, theorizing from contextualized

explanations are always bound to contingencies and contexts (WELCH et al., 2011), and causal mechanisms depend on spatiotemporal facts (HEDSTRÖM; YLIKOSKI, 2010).

The case of Pacto Alegre sensitizes to the materially related complexities of the human condition (CHIA, 1996). The Pact acted as a catalyst enrolling diverse actors into the ecosystem. Nevertheless, while some controversies were (to some extent) silenced, "translations are never final. They continue in time, always changing, as they are subjected to constant negotiation, compromise, revolution and subversion" (PIPAN; CZARNIAWSKA, 2010, p. 244). Thus, like objects under construction (ENGESTRÖM; BLACKLER, 2005), strategies (and their histories) might eventually 'bite back' with new translations afoot.

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2.9 **APPENDIX A**

Table A.1. The Pact's macro-challenges and the selected 24 projects.

Macro-challenge	Project	Brief description and objectives
Talent *To capacitate, maintain and attract talented human capital*	Innovative Teacher/Professor	To engage teachers and professors as agents to raise the standard of public education. To develop training and qualification programs, to foster more synergy between universities and the municipal education system to exchange good practices, and to stimulate and support new teaching methodologies and practices.
	Innovation Olympics	To promote the culture of entrepreneurship and innovation in the student community. The main goal would be to engage young inhabitants to participate in processes of generating innovation for urban problems in a playful way, also encouraging experimentation practices.
Urban Transformation *To develop smart and creative environments to live and work*	4D Hands-On	Upgrade and revitalization of 4D (a local urban area) with the engagement of the local community, entrepreneurs and innovation agents. To develop urban intervention also providing more pleasant urban spaces to induce innovative projects.
	Cultural Interventions	Valorization of the urban landscape through paintings and cultural interventions in strategic collectively-managed public spaces.
	Citizenship Culture	To foster a citizenship culture, i.e. encouraging citizens to value and care for public assets, stimulate citizens to know the city's problems and to participate in their solutions, also increasing the citizens' self-esteem towards the city.
Business Environment *To generate a world-class innovation ecosystem*	Innovation Blitz	To encourage interactions between the citizens (as a whole) and the most advanced actors in the city's innovation ecosystem.
	POA Express Licensing	To simplify and streamline digital processes for opening and licensing companies, stimulating new venture creation and attracting investments to the city.
	POA Connect	Creation of a digital platform to increase the connection and synergy of the city's actors, organizing and connecting local demands with available service providers, also increasing transparency in the relationships between individuals and their projects.

	POA Crowdfunding	Improve financial support for early-stage startups, also reducing their risks for survival.
City Branding *To promote Porto Alegre as an innovative city*	POA 2020	Articulation and generation of a globally-known annual event focusing on creative economy and innovation development, connecting existing initiatives undertaken by local agents.
	POA Routes	To enhance the city branding by consolidating and articulating the dissemination of key routes based on the main local assets and initiatives (in the areas of Gastronomy, Craft Breweries, Innovation and Knowledge, Creative Economy, Sports and Leisure, and so on), adding value to communities involved with each route.
	Place Branding	To develop a brand that positions and values the city, for both external (worldwide communication strategy) and internal (city self-esteem) uses.
Quality of life *To improve people's well-being in health, safety, culture, and the environment*	Moving around with POA	To promote quality of life and social inclusion through sports, guided by professionals in public squares and parks, from downtown to peripheral regions.
	WOnd3r Wonderful Water	To improve the quality of water treatment in the city, expanding access to information on water quality analyses for citizens.
	All-Generation Smart City	To develop a smart city with special attention to the children and the elderly, becoming a global reference in the care of these populations.
	Engaged POA	To develop a co-action platform to engage collaborations to care for public spaces.
Modernization of Public Administration *To improve and facilitate access to public services for the population and businesses*	One Single Citizen	To generate a unique digital identity that integrates citizen data expanding and facilitating the population's digital access to public services, increasing efficiency in the use of the citizen information by the city council, and stimulating the digital relationship among different actors through a platform.
	Transparent City	To facilitate the access of data from the city council openly and clearly for the citizen, providing public data and information on public policies in a friendly-user digital platform. Also, to forge mechanisms for interaction among the public sector, universities, civil society and the private sector to generate projects based on open data.
	Start.Gov	Modernizing Public Administration by disseminating the startup culture, stimulating the agile mindset within the public administration, fostering experimentation to solve

		the city's problems, and collectively building solutions to problems through hackathons.
Strategic Proposals	Caldeira Institution	To provide spaces for detecting and supporting the development of new talents and ventures, also helping to globally connect the local innovation ecosystem through missions and connections in renowned world-class ecosystems.
	Transformative Education	To transform schools into maker spaces that encourage creativity, entrepreneurship and innovation. To provide an integrated and supportive education system guided by excellence, and to stimulate the discussion of the challenges and opportunities of the knowledge-based society.
	The Alliance MBA in Innovation Ecosystems	To collectively train innovation agents in the public and private environments using the expertise from the three universities (Alliance for Innovation).
	Digital Healthcare	To provide an integrated health information-sharing platform across the city, allowing portability, integration, and quick access to the attendance and exam history of each citizen's health history.
	Innovative Urban Design Guidelines	To discuss and propose new urban guidelines that encourage the development of urban environments better suited to the emerging social dynamics in the 21st century. This project would provide technical support for the city's Master Plan revision.
Note 1: this is the list of projects officially approved by the Pact's executive board on May 31, 2019. Subsequent events and translations led to transformations (such as elimination, merges, and inclusion of new projects) that can diverge with the Pact's official website. Some of these transformations are discussed in the paper. **Note 2:** the three-letter code POA is found in some projects' names and it stands for Porto Alegre's official location code defined by the *International Air Transport Association*.		

3 PAPER 2 – Are we ready to assess digital readiness? Exploring digital implications for social progress from the Network Readiness Index

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ABSTRACT

Extant literature has increased our understanding of the multifaceted nature of digital technologies; nevertheless, scholars and policymakers still strive to understand their implications for society. On this account, the Network Readiness Index (NRI) emerged as one of the main reports to support governments in leveraging digital technologies for economic development and social progress. However, which individual indicators have more influence than others on impact subindices for socio-economic development? And considering recent debates around the digital divide, does the NRI address major concerns to comprehensively assist policymakers in leveraging ICTs for inclusive development? This study reveals the indicators that most significantly influence the NRI's economic and social impact pillars based on the Least Absolute Shrinkage and Selection Operator (LASSO) analysis of NRI for 2013-2016. Furthermore, we draw on extant literature to discuss gaps and limitations in the NRI in terms of scrutiny of populations with access to digital technologies, and we set out an agenda for future research and policy to address digital divides more comprehensively.

Keywords

Information and Communication Technology; Digitalization; Digital divide; Policymaking.

4 PAPER 3 - [Re]viewing the scientific structure of ethno-racial entrepreneurship research: intellectual foundations, thematic evolution, and ways forward.

ABSTRACT

Although the entrepreneurial activity is acknowledged as a powerful engine in the processes of regional economic development and individual social mobilization, less is known about how racialized individuals are addressed in business and management literature. We contend that scholarship needs a more fine-grained appreciation of the entrepreneurial phenomena to account for the lived experiences of racial and ethnic individuals undergoing entrepreneurial endeavors. For that purpose, we combined bibliometric and thematic analyses on ethno-racial entrepreneurship to reveal the underpinning concepts and themes of this literature, and pave the way for a more structured agenda that addresses race and ethnicity in their own right.

Keywords

Black entrepreneurship; ethnic entrepreneurship; minority-owned business; bibliometric review.

4.1 Setting the stage for the review: So, why race and ethnicity?

Popular discourse has portrayed entrepreneurship as a macro-economic driver and a means to personal empowerment, generally disregarding its access reduced to a select group of individuals and restricted to privileged contexts (BRUTON; AHLSTROM; OBLOJ, 2008; RINDOVA; BARRY; KETCHEN, 2009; SABELLA; EL-FAR, 2019). This limited view of entrepreneurial phenomena has been the target of increasing critique questioning the underrepresentation of different sorts of disadvantaged individuals which have become invisible in the consideration of companies, policymakers, and scholars alike (DAR et al., 2021; DY, 2020; OGBOR, 2000).

To shed light on a number of minority individuals within entrepreneurial endeavors, as well as obstacles experienced by them, scholars have advocated inquiries on the experiences of marginal entrepreneurs – that is, individuals different from the hegemonic ideal of a straight, white, adult, male entrepreneur (OGBOR, 2000) – in the form of women, LGBTQ+, disabled, older and younger people (DY, 2020). Nonetheless, race and stereotypical features may add difficulties to both labor market and entrepreneurship, since whiteness may afford credentials to a few individuals (MARTINEZ DY; MARTIN; MARLOW, 2018; RAY, 2019). Hence, entrepreneurship literature has also explored related topics from the perspectives of immigrants (ALIAGA-ISLA; RIALP, 2013; DABIĆ et al., 2020; DHEER, 2018) and refugees (ALRAWADIEH; KARAYILAN; CETIN, 2019; BIZRI, 2017).

Despite the efforts for a more comprehensive account regarding different populations, we argue that race and ethnicity deserve a particular consideration in entrepreneurship scholarship since both processes – racial social processes and ethnic processes – are influential in structuring socioeconomic inequalities (LEE SHIAO, 2015). On this account, what are the intellectual and conceptual structures of the ethno-racial entrepreneurship (ERE) research in the business and management literature? What has been done so far and how can scholars move forward? We contend that scholarship needs a more fine-grained appreciation of entrepreneurship phenomena, which should be able to account for the lived experiences of the diverse set of individuals undergoing entrepreneurial activities. For that purpose, we conducted a bibliometric review and analyses of ERE research field, and we aim at: (i) showing the growth and evolution of the topic over time for a useful historical perspective on the presence of the ERE research in the literature up to the present; (2) shedding light on the field's current areas of interest through thematic analysis, which enables identification of clusters representing the latest research themes in the ERE field; and (3) from this bibliometric approach, identifying research topics and theoretical perspectives that warrant attention.

4.2 **Method**

For the present study, we combined bibliometric review and content analysis (i) to map and understand the intellectual and conceptual structures within ERE research, (ii) to explore the domain more comprehensively, and (iii) to set an agenda for future research. Bibliometric

review affords comprehensive analyses of published research through statistical set of tools, thus revealing thematic trends and intellectual structures of a given domain (PAUL; CRIADO, 2020). Bibliometrics is a subfield of informetrics, which measures the impact of scientific publications through statistical techniques to understand the related level of knowledge dissemination (BROADUS, 1987). Hence, bibliometrics is essentially a quantitative analysis of publications to ascertain specific phenomena in which researchers can examine literature, establish characteristics of disciplines, obsolescence of scholarship, as well as institutional affiliations and relationships (HÉRUBEL, 1999; ZUPIC; ČATER, 2015). Within these data lie other possibilities, which can be extremely useful to understand the evolution a discipline.

Bibliometric methods are useful in literature reviews because they guide the researcher to the most influential works while also mapping a domain, thus minimizing subjective bias (ZUPIC; ČATER, 2015). In what follows, we detail the processes of data collection and analysis.

4.2.1 *Data Collection*

In this study, we followed similar reviews (e.g. REY-MARTÍ; RIBEIRO-SORIANO; PALACIOS-MARQUÉS, 2016) and we adopted the Web of Science (WoS) database. WoS is the most adopted source for bibliographic data (ZUPIC; ČATER, 2015); it contains data for most bibliometric analyses, and it covers more than 21,000 journals, 1.5 billion cited references—dating back to 1900—across 74.8 million total records (CLARIVATE, 2021).

To collect data from the WoS database, we opted for a simple but wide-ranging choice of words, resulting in the following Boolean expression: (("ethnic*" OR "race" OR "racial*") AND (entrepr* OR "new venture" OR startup* OR "small business*")). The authors executed the search string using the WoS field labelled as topic (including titles, abstracts, and keywords). The search was conducted in September 2021 and resulted in 2,165 records. Then, we applied restrictions on the year, document type, discipline, and language. Regarding the year, two points are worth emphasizing. First, although we did not specifically add an initial time restriction, WoS only retrieves materials from 1945. Second, considering that recent publications may not have enough time to receive considerable number of citations—imperative for our appraisal (MASSARO; DUMAY; GUTHRIE, 2016)—, we selected documents published until 2020.

For document types, we included only journal articles in our analysis, as they have been recommended for structured reviews within entrepreneurship research (KRAUS; BREIER; DASÍ-RODRÍGUEZ, 2020), and we excluded reviews, books and book chapters, conference proceedings, and editorial material. Moreover, the authors limited the search to 'Business' and 'Management' disciplines to ensure the search was not too broad and still focused on business- and/or management-related concerns, following similar strategies adopted elsewhere (LASHITEW et al., 2021; SOTO-SIMEONE; SIRÉN; ANTRETTER, 2020). Finally, the authors only included articles written in English.

To guarantee that the selected articles were appropriate for the research, three authors of the paper also read all titles and abstracts, and excluded records that were not fit for the research purpose—for instance, studies using the word "race" on the title/abstract, but not dealing with racial(ized) issues (e.g. CHEN; QIAN; NARAYANAN, 2017)—, which resulted in a final set of 392 articles. Table 1 summarizes the main information within the final dataset. In what follows, we detail the data analysis executed for the research.

Table 1. Main information about the data.

Description	Results
Timespan	1994:2020
Documents	396
Average citations per documents	34,5
References	19,910
Keywords Plus	844
Author's Keywords	994

4.2.2 *Data Analysis*

In the present study, the authors conducted the bibliometric analysis on the R-based package bibliometrix (ARIA; CUCCURULLO, 2017) using the RStudio software (RSTUDIO TEAM, 2020). In this regard, we executed a two-level bibliometric analysis, namely: a) performance analysis, and b) science mapping (DONTHU et al., 2021).

On the one hand, performance analysis highlights main characteristics of the sample and measures its performances by quantifying the research field (production trends), identifying the most relevant/productive authors and journals, and evaluating groups of

scientific actors (NEDERHOF; VAN RAAN, 1993), which allows the examination of contributions of constituents in a given research field (RAMOS-RODRÍGUEZ; RUÍZ-NAVARRO, 2004). By contrast, science mapping provides a spatial representation of the relationship among disciplines, fields, specialties, and individual papers or authors (COBO et al., 2011). Science mapping, then, relies on quantitative bibliometric techniques to expose the (intellectual and conceptual) structures and dynamics of scientific knowledge (ZUPIC; ČATER, 2015).

In addition to mapping the field, we wished to understand in more depth how race and ethnicity have been addressed within entrepreneurship research. Thus, we followed recent studies that combined bibliometric and content analyses (BRETAS; ALON, 2021; DABIĆ et al., 2020; LASHITEW et al., 2021) to uncover additional discussions and provide new avenues for future studies.

For the content analysis, the authors selected the most influential publications based on total global citations per year, and analyzed them according to the Theory-Context-Methodology (TCM) framework (PAUL et al., 2021; PAUL; PARTHASARATHY; GUPTA, 2017). Here, the purpose was to develop theoretical highlights in a clear and comprehensive manner adopting a recommended structure (DABIĆ et al., 2020; PAUL et al., 2021).

Figure 1 summarizes the processes of data collection and analyses executed for the present research. Next, we present our findings as follows: performance analysis, intellectual structure, and conceptual structure.

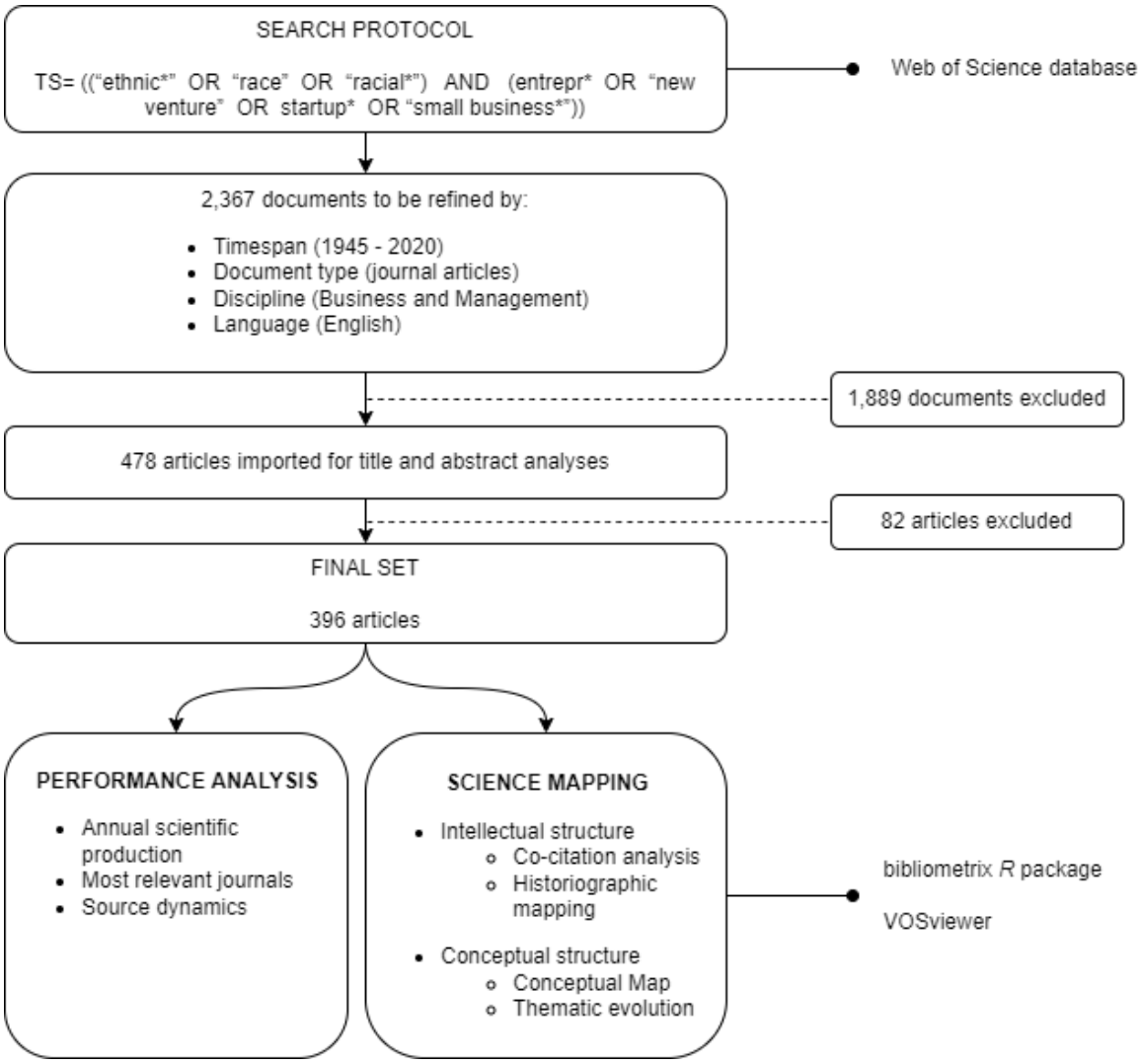


Figure 1. Search, selection, and bibliometric analyses executed for the research.

4.3 **Results**

4.3.1 ***Performance analysis***

Figure 2 shows the yearly publication in our dataset going back to 1994 with the seminal work of (COOPER; GIMENO-GASCON; WOO, 1994) on predictors of new venture performance. In their work, among other findings, the authors revealed poorer performance (related to marginal survival and growth) for racial-minority-led ventures. Since then, studies dedicated to address race/ethnicity within entrepreneurship have grown steadily with small peaks in the years of 2009 and 2015 (20 articles each); nevertheless, one may observe a major increase in the number of publications from 2017 (43 articles) onwards. In fact, the total

number of publications in the period of 2017-2020 (203 articles) represents 51 percent of the entire production in our sample.

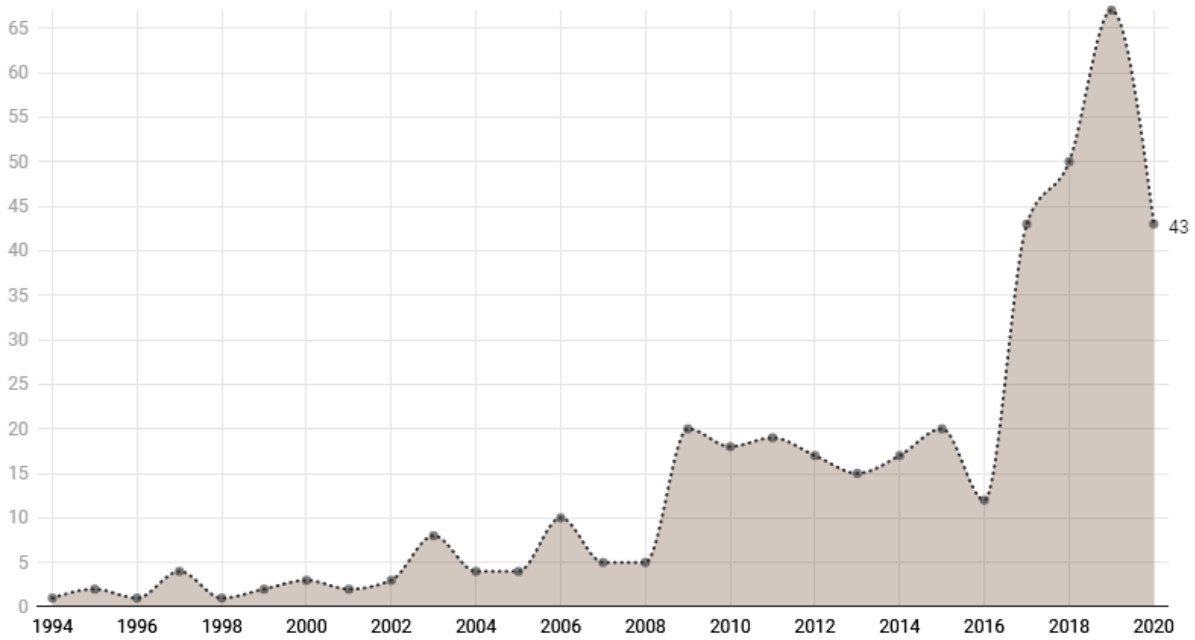


Figure 2. Annual scientific production

Many factors may have contributed to the rise of publications in recent years. Some journals published special issues/sections on related topics which also influenced this observed increase in publications, as the cases of SBE on “Minority entrepreneurship in 21st century America” (BATES; BRADFORD; SEAMANS, 2018), and IJEBR on “Migration, enterprise and society” (VERSHININA; RODGERS, 2019) and “Intersectionality and entrepreneurship” (ABBAS et al., 2019). Table 2 presents the five most relevant journals based on the number of local publications, and Figure 3 depicts the dynamics of publications within these outlets.

Table 2. The five most relevant journals ordered by the number of local publications (LP) in the sample.

#	Sources	LP	TP[1]	JCR[2]	CiteScore[3]	CABS[4]	ABDC[5]
1	*Entrepreneurship & Regional Development (ERD)*	36	914	6.408	8.0	3	A
2	*Small Business Economics (SBE)*	31	1,982	7.096	10.7	3	A
3	*Journal of Small Business Management (JSBM)*	23	1,044	6.881	8.4	3	A
4	*International Journal of Entrepreneurial Behavior & Research (IJEBR)*	23	892	5.995	8.0	3	B
5	*International Small Business Journal-Researching Entrepreneurship (ISBJ)*	22	1,115	6.413	8.7	3	A

[1]Total publications until 2020

[2]2021 Journal Citation Reports

[3]2021 CiteScore

[4]2020 Academic Journal Guide by the Chartered Association of Business Schools (UK)

[5]2019 Journal Quality List by the Association of Business Deans Council (Australia)

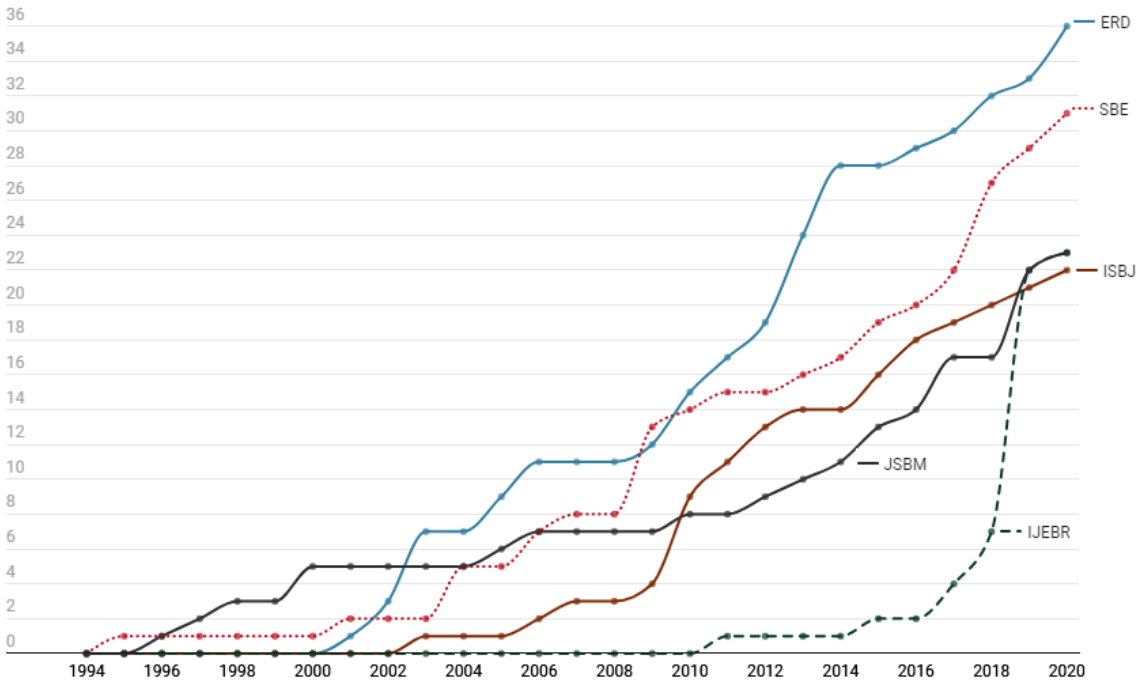


Figure 3. Cumulative occurrences of publications amongst the five most productive journals over the years.

4.3.2 *Intellectual structure*

Visualizing the intellectual structure is important because it allows scholars to comprehend the knowledge foundation of a research domain (DONTHU et al., 2021; SHAFIQUE, 2013). In the present study, we conducted co-citation analyses to reveal how the 50 most co-cited documents on ERE are connected. Figure 4 depicts the documents co-citation network split in three major clusters.

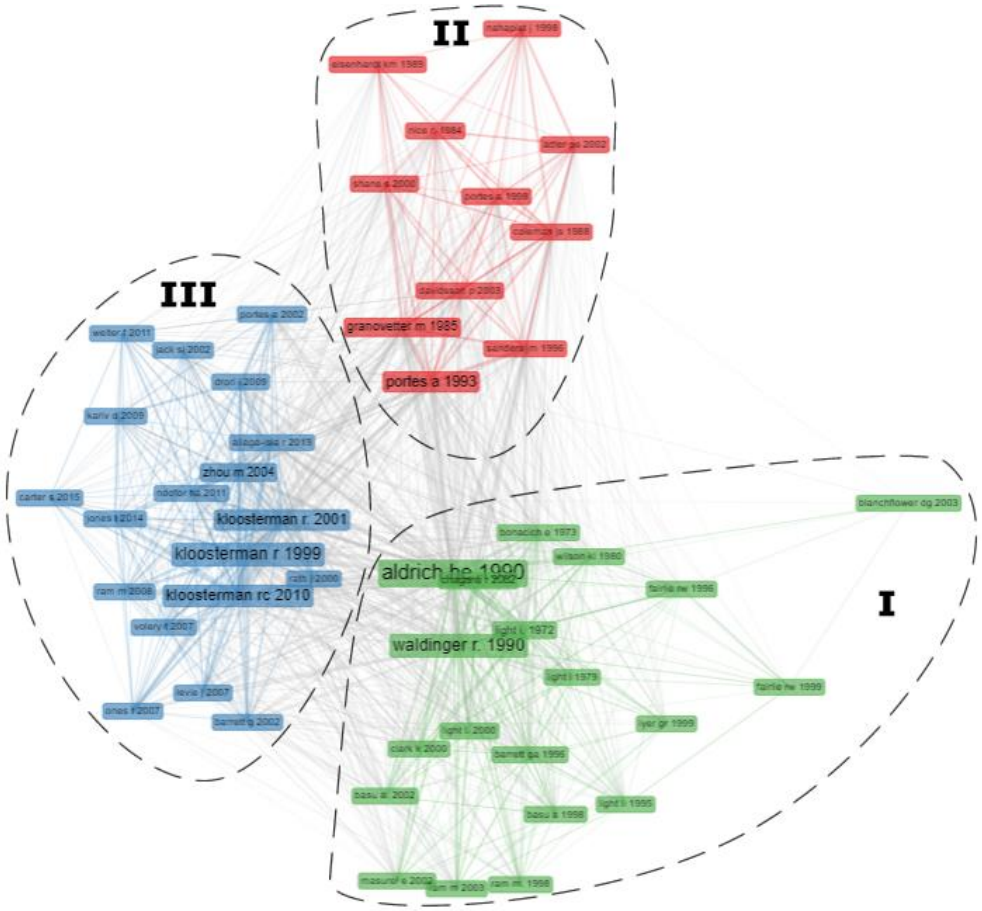


Figure 4. Document co-citation network

Cluster I (green) comprise studies debating dimensions and definitions of ethnic entrepreneurs(hip) (ALDRICH; WALDINGER, 1990; CHAGANTI; GREENE, 2002; IYER; SHAPIRO, 1999; WALDINGER; ALDRICH; WARD, 1990), also exploring influences on the rates of self-employment among ethnic/racial groups (CLARK; DRINKWATER, 2000; FAIRLIE, 1999; FAIRLIE; MEYER, 1996). In this cluster, authors elaborate on the hostility and discrimination faced by these communities (BLANCHFLOWER; LEVINE;

ZIMMERMAN, 2003; BONACICH, 1973) and the need for policy development to support ERE in its wide-range diversity (BASU, 1998; RAM; SMALLBONE, 2003).

By contrast, Cluster II (red) has greater focus on considering social relations in the analysis of behavior and institutions; that is, the argument of 'social embeddedness' (GRANOVETTER, 1985; PORTES; SENSENBRENNER, 1993). In this sense, studies within this cluster draw heavily on the concept of social capital (ADLER; KWON, 2002; BOURDIEU, 1984; COLEMAN, 1988; PORTES, 1998) to understand how it may affect the development of other sorts of capital—such as, for instance, intellectual capital (NAHAPIET; GHOSHAL, 1998)—and its implication in the process of starting/succeeding in a business (DAVIDSSON; HONIG, 2003), with special attention to the perspective of immigrants (SANDERS; NEE, 1996).

Studies in Cluster III (blue) explore race and ethnicity in the context of both immigrant (ALIAGA-ISLA; RIALP, 2013) and transnational (DRORI; HONIG; WRIGHT, 2009) entrepreneurship, the latter referring to "continuing relations between immigrants and their places of origin and how this back-and-forth traffic builds complex social fields that straddle national borders" (PORTES; GUARNIZO; HALLER, 2002, p. 279). Here, papers elaborate on the concept of 'mixed embeddedness' to account not only for the social networks of immigrants, but also the institutional and economic environments in which these populations come to be inserted (KLOOSTERMAN, 2010; KLOOSTERMAN; RATH, 2001; KLOOSTERMAN; VAN DER LEUN; RATH, 1999). Thus, there is greater concern to position investigations in their context for a proper comprehension of entrepreneurial phenomena (BARRETT et al., 2002; JACK; ANDERSON, 2002; JONES; RAM, 2007; WELTER, 2011).

Figure 5 portrays the historiographic mapping (Garfield, 2004) of ERE research. In this case, our historical direct citation network resulted in four main research paths (and core authors/documents), namely: female ethnic entrepreneurship (ESSERS; BENSCHOP, 2007; ESSERS; BENSCHOP; DOOREWAARD, 2010); entrepreneurial activity/orientation of ethnic minorities (DEAKINS et al., 2007; LEVIE, 2007; WANG; ALTINAY, 2012); (im)migrant entrepreneurship (BECKERS; BLUMBERG, 2013; COLLINS; LOW, 2010; CONSTANT; ZIMMERMANN, 2006; JONES et al., 2014; RAM; SMALLBONE, 2003; SEPULVEDA; SYRETT; LYON, 2011); and ethnic new venture formation, strategy, and

performance (CHAGANTI et al., 2008; CHAND; GHORBANI, 2011; IYER; SHAPIRO, 1999; KALNINS; CHUNG, 2006; NDOFOR; PRIEM, 2011).

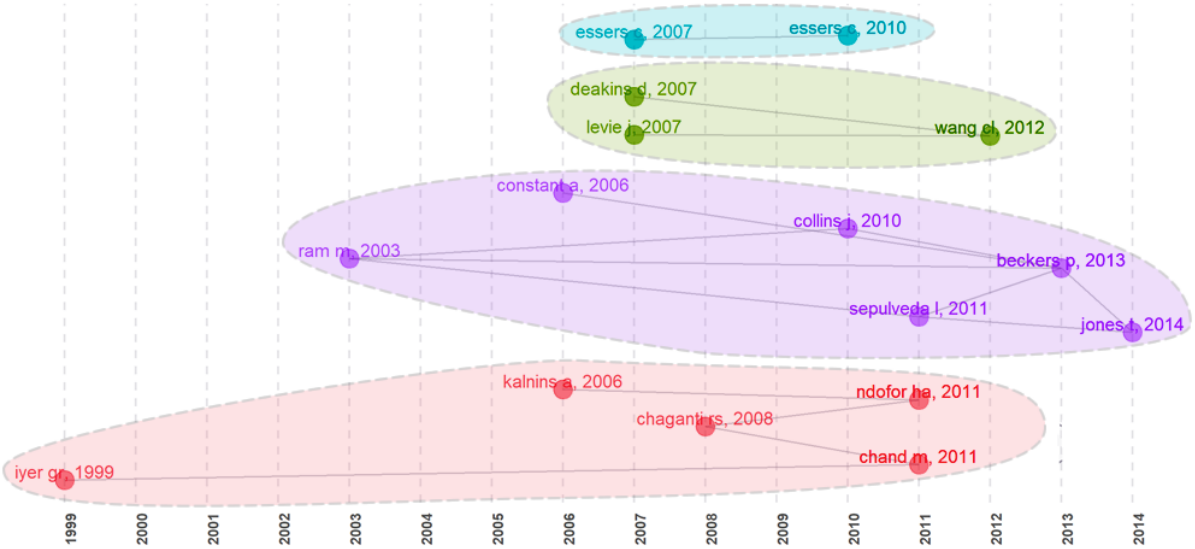


Figure 5. Historiographic mapping of ERE research.

4.3.3 *Conceptual structure*

While, in the previous section, we connected documents using measures of co-citation, we now turn to the co-occurrence of keywords amongst the papers within our sample to visualize the conceptual underpinnings of ERE research. The reasoning behind this strategy is that keywords frequently co-occurring may reveal underlying concepts and themes, therefore representing the conceptual space of a domain (ZUPIC; ČATER, 2015) and enriching the interpretation of the co-citation analysis (DONTHU et al., 2021). Next, we present different forms of visualization of the conceptual structure of ERE research provided by VOSviewer (Figure 6) and bibliometrix (Figure 7).

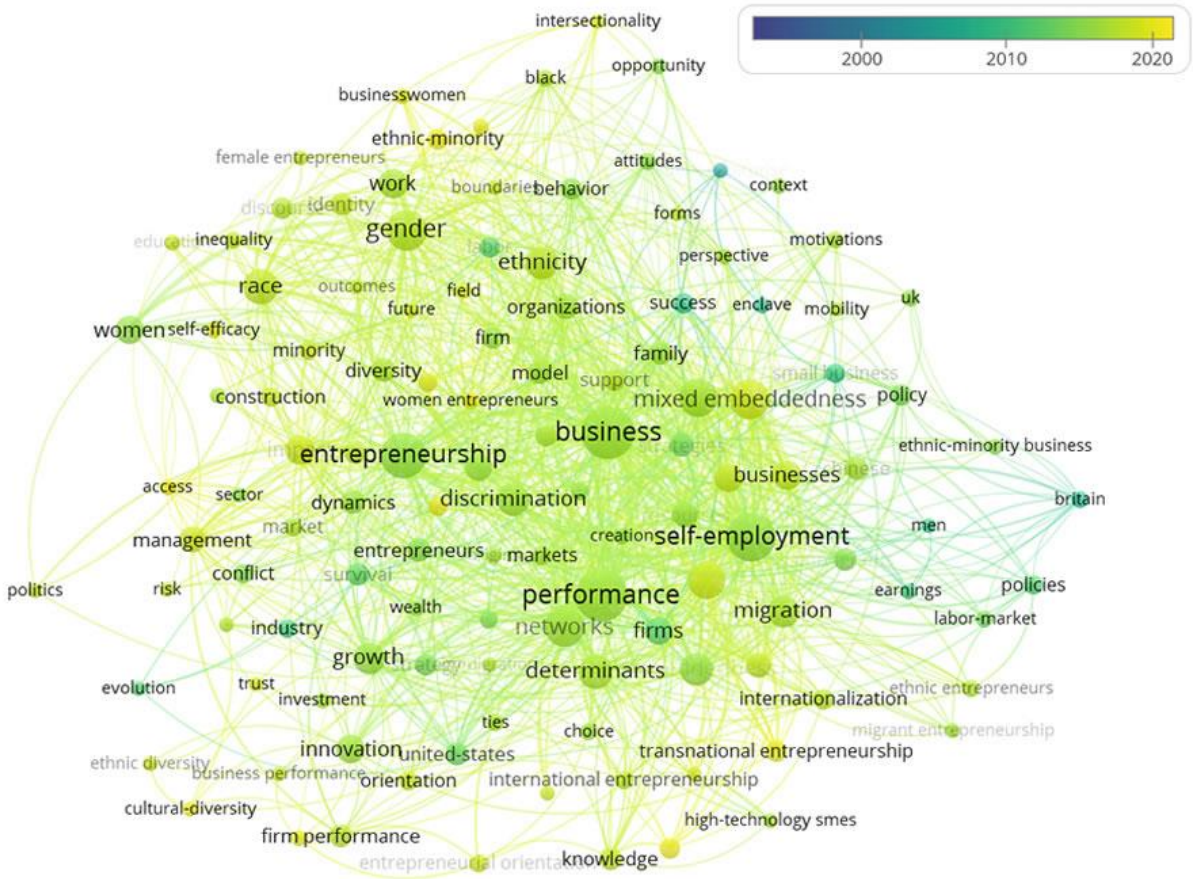
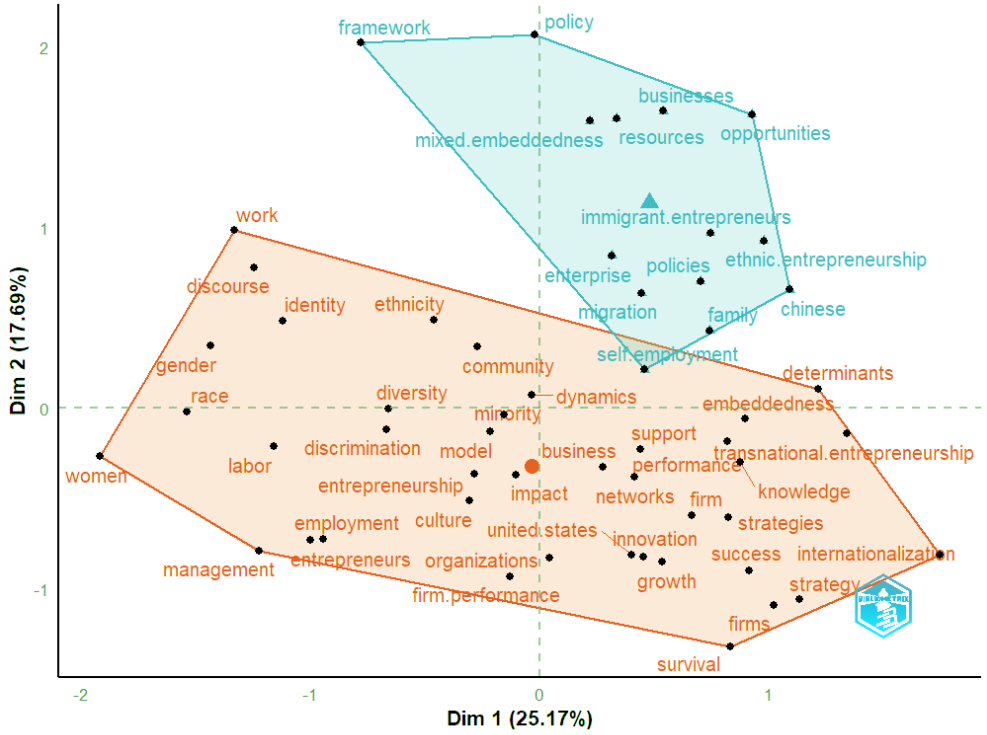
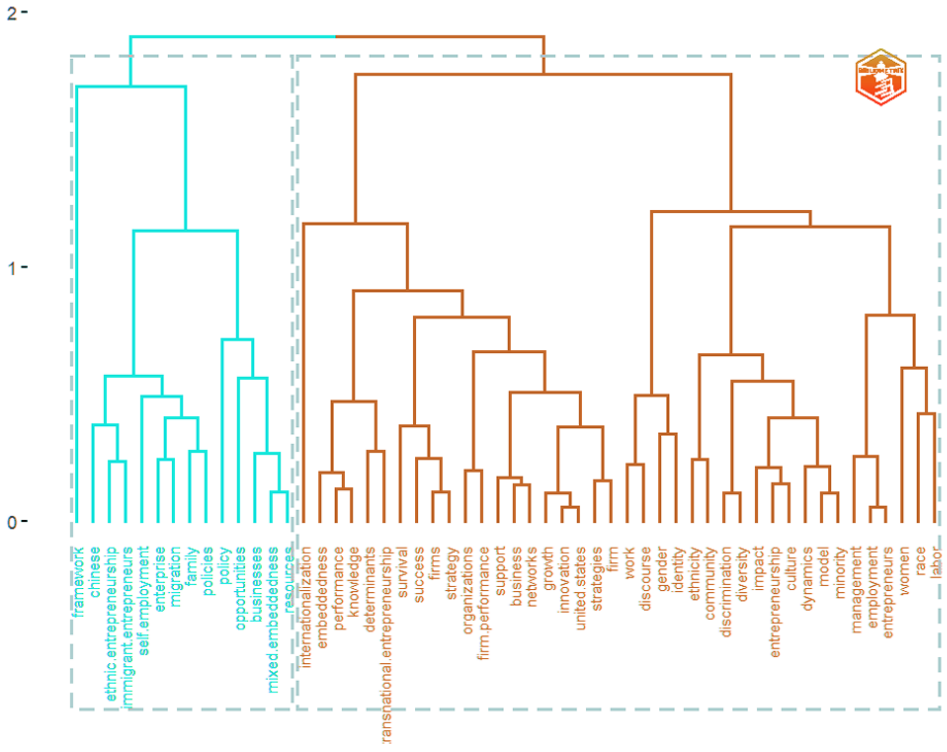


Figure 6. Co-occurrence network.

Figure 6 exhibits the co-occurrence network visualization. Each node in a network represents a keyword, wherein: (i) the size of the node indicates the number of times that the keyword occurs, (ii) the link between the nodes represents keywords that co-occur or occur together, (iii) the thickness of the link signals the occurrence of co-occurrences between keywords, (iv) the bigger the node, the greater the occurrence of the keyword, and (v) the thicker the link between nodes, the greater the occurrence of the co-occurrences between keywords. We included a temporal dimension in the analysis to identify which keywords were more mobilized in previous years (e.g. policies, Britain), and which keywords have been mobilized more frequently in the past few years (e.g. ethnic minority, cultural diversity).



(a) Conceptual Structure Map



(b) Topic Dendrogram

Figure 7. Conceptual map of ERE research.

Figure 7 depicts the conceptual map of ERE research through a conceptual structure map (Figure 7a) and a related topic dendrogram (Figure 7b), both were plotted from a multiple correspondence analysis on the keywords of the papers. The colors represent the clustering of the keywords, and it allows us to observe how they have been mobilized in conjunction. It is worth noting that both Figures 6 and 7 allow us to identify two sets of keywords that are not frequently used together; we find themes such as “black”, “race”, “gender”, and “discrimination” representing one set of keywords and, somewhat distant from them, another set of themes comprising “high-technology smes”, “strategy”, “internationalization”, and “success”.

Finally, Figure 8 reveals the thematic map for the entire sample. The results of keyword analyses were plotted in a two-dimensional thematic map according to values of centrality and density. Centrality refers to the degree of interaction among networks with other networks (theme’s relevance), whereas density indicates the strength of the links within a network (theme’s development) (c.f. CALLON; COURTIAL; LAVILLE, 1991). For the thematic map, we considered the co-occurrence of 250 keywords plus.

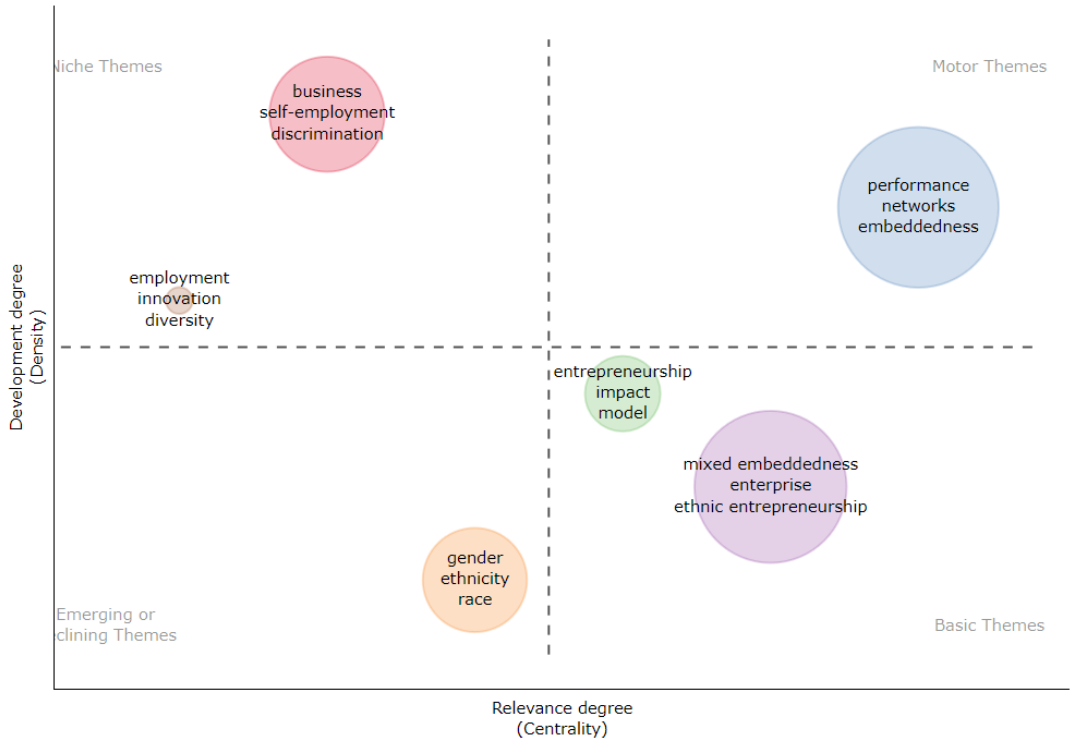


Figure 8. Overall thematic map of ERE research.

The bubble sizes are proportional to the cluster keyword occurrences, and they are positioned among four quadrants (c.f. CALLON; COURTIAL; LAVILLE, 1991; COBO et al., 2011). Themes located in quadrant 1 (upper-right) present strong centrality and high density and are thus the motor themes. Themes in quadrant 2 (upper-left) are peripheral (low centrality) and highly developed; these are very specialized, high developed and isolated themes, or niche themes. Themes in quadrant 3 (lower-left) are peripheral and little developed; they may thus represent emerging or declining themes. Thematic clusters in quadrant 4 (lower-right) are central, so they are connected to other clusters, but they are relatively low in density (degree of development); these themes are important to the domain, though not well developed, thus considered basic and transversal themes.

4.4 **Implications and future directions**

The aim of this bibliometric study was to offer an overview of the ERE research field, to detect and synthesize key topics, and outline future research opportunities. The present study is based on performance analysis and scientific mapping by co-citation and co-word analyses. It includes a total of 396 documents published during the 1994–2020 period. Unsurprisingly, most publications on ERE stem from entrepreneurship-specific journals, namely: Entrepreneurship & Regional Development, Small Business Economics, Journal of Small Business Management, International Journal of Entrepreneurial Behavior & Research, and the International Small Business Journal.

From the intellectual structure, we observe discussions on the topic draw on different perspectives – ranging from enclave thesis and social capital theory to mixed embeddedness (ALIAGA-ISLA; RIALP, 2013; KLOOSTERMAN, 2010; KLOOSTERMAN; RATH, 2001) – to understand how ‘othered’ individuals cope with adversities. The thematic appraisal, on the other hand, affords us a visualization of hot topics associated with ERE research field. On this account, there remains opportunities to address timely subjects beyond issues of survival/necessity entrepreneurship. ERE research could explore deeper relations between racial entrepreneurship from/within the digital age. Exemplar recent efforts disclose the replication of structural discrimination against racialized individuals in crowdfunding (YOUNKIN; KUPPUSWAMY, 2018, 2019); nevertheless, there is room for more. At the

individual-level, how can digital afford (AUTIO et al., 2018; FAYARD; WEEKS, 2014) novel opportunities for entrepreneurs out of their lived experiences? At meso- and macro-levels, how can entrepreneurial ecosystems leverage cultural diversity (AUDRETSCH; BELITSKI; KOROSTELEVA, 2021) for inclusive competitive advantage?

4.4.1 *Limitations and concluding remarks*

Inevitably, this study faces several limitations. This study reduced the bias often associated with traditional literature reviews and expert surveys using a systematic research methodology. Nevertheless, the findings are influenced by the scope and nature of the underlying research design and methods.

First, the dataset was collected through the *Web of Science* database to obtain higher-quality results. However, this limited the number of analyzable publications. In addition, we imposed exclusion criteria to improve the performance analysis (i.e., publication year, document type, language, and research fields). Second, the restriction to specific keywords and/or journals while building the sample may have impacted the results. This study employed a rigorous sample selection procedure to minimize sampling bias by choosing multiple keywords and a wide range of journals and articles belonging to all business domains. Finally, as is the case with any bibliometric analysis, the results are the outcome of the algorithm employed by the analytic software.

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5 Final considerations

Through this doctoral thesis, I aimed at delving deep into some aspects related to the dynamics 4.0 to (i) unravel fundamental mechanisms in the creation of local ecosystems, and to (ii) provide guidance to policymakers and scholars to identify relevant indicators to leverage information and communication technologies for socioeconomic progress; also, I aimed at (iii) exploring how racialized individuals are (dis)regarded within such dynamics and (iv) science mapping the ethno-racial entrepreneurship research field. To achieve the primary goal of the thesis - to problematize the disregard for the lived experiences of the Black community by bringing to the fore the strategy-making/implementation processes underneath the establishment of ecosystems and digital adoption for inclusive development, and thus put forward a more balanced account of their relevance in such dynamics 4.0 -, and to respond to the research question more comprehensively, I structured the present thesis around three separate (interrelated) investigations in the form of research articles.

First, I conducted an ethnographic inquiry in a local mobilization to create and develop an entrepreneurial ecosystem. The exploration allowed me to theorize that strategists launch collaborative ecosystems by making use of strategizing mechanisms that enable ecosystem leaders to attract and attain participation from multiple stakeholders and to advance specific agendas. As a counter-effect, I suggest these performative mechanisms may be mobilized to silence underrepresented individuals and groups of relevant stakeholders overlooked by mainstream ecosystems. Thus, ecosystem leaders should pay close attention to contextual social and economic features of the place to take into account inclusiveness for proper development.

Second, I performed regression analyses to identify and inform policymakers and scholars on how digital adoption may be leveraged for inclusive development and social progress from the Networked Readiness Index. I relied on an international and reputable report to disclose important indicators affecting socioeconomic outcomes accruing from digital technologies, and I provided a critical analysis on the scant representation of marginalized groups under consideration in the index, which is crucial, considering the impact and reach of such a report.

Last, I executed a systematic review by means of bibliometric analyses on ethno-racial entrepreneurship (ERE) research within business and management. Here, the purpose was to provide scholars (as well as other sorts of individuals interested in the topic) not only a picture of the subject, but also a means to strategize and plan the continuation of ERE scholarship who will explore and advance entrepreneurial activity for racialized individuals, also considering timely and relevant aspects of dynamics 4.0 which is somewhat detached from current ERE literature.

The present thesis was built around a multi-method research, which entails challenges but reveals fruitful implications for both research and practice. With the combination of exploratory qualitative and quantitative methods, coupled with critical analyses, I strived to contribute to the Production Engineering community by providing tools, techniques, and reflection on the effects of the current dynamics 4.0, which go (way) beyond manufacturing facilities and organizational boundaries. Technological advancements are generally celebrated and advocated to be instantaneously adopted and fostered, with rather low levels of critical consideration on the potential pitfalls accruing from them, or even how the benefits generated from such technologies could become more comprehensive.

Throughout this thesis, I opened the black box of dynamics 4.0 to disclose how Black individuals are not appropriately considered within contemporary debates and mobilizations. Ecosystem leaders, policymakers, and scholars seem to be represented mainly by individuals less sensitive to the needs of Black and ethnic populations. As an outcome, the racial discrimination inherited from the traditional structures of capitalism finds room for reproduction in modern arrangements. This disregard for Blacks in current dynamics is not exclusively deliberate, but it also stems from historical and cultural accounts influencing processes of decision-making and reflection.

By writing this thesis, I stand with Dar *et al.* (2021) to advocate a scholarly community centered on collective self-reflection for a prosperous and sustainable future. I hope this work encourages and inspires the next generations of engineering scholars of color to “not merely survive, but live, learn and work in environments that sustain their knowledge and desire their truth” (DAR et al., 2021, p. 702). This means that we - Black scholars, Black ecosystem leaders, Black policymakers - must rely on our blackness to build a different

rationale and make the most of collaborative efforts, digital technologies, and data to develop and nurture Blackness 4.0.

5.1 **REFERENCE**

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