



From Growth Poles and Clusters to Business Ecosystems Dynamics: The ILDI Counterproposal

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Abstract

The study of spatial socio-economic development constitutes a significant field of analysis of innovation creation and diffusion. Understanding the spatial evolution of the different socio-economic systems in the age of globalization requires a synthesizing and integrated theoretical approach to how innovation is generated and replicated. This article aims to study three significant spatial socio-economic development theories –the growth poles, the clusters, and the business ecosystems. A literature review reveals that (a) the concept of growth poles concerns mostly the analysis of spatial polarization between specific territories and regions, (b) the clusters concept addresses the issue of developed inter-industrial competition and co-operation from a meso-level perspective, and (c) the analytical field of business ecosystems provides an evolutionary approach that can be valorized for all co-evolving spatial socio-economic organizations. In this context, an eclectically interventional mechanism to strengthen innovation is suggested. The Institutes of Local Development and Innovation (ILDI) policy is proposed for all firms and business ecosystems, of every size, level of spatial development, prior knowledge, specialization, and competitive ability. The ILDI is presented as an intermediate organization capable of diagnosing and enhancing the firm’s physiology in structural Stra.Tech.Man terms (strategy-technology-management synthesis).

Keywords: Spatial socio-economic development; Business ecosystems; Clusters; Growth poles; Institutes of local development and innovation (ILDI); Stra tech man physiology.

1. Introduction

The current phase of crisis and restructuring of globalization is an epoch where all economic and business networks are heading towards rapid mutations and readjustments in all spatial levels: local, regional, national, international, and global (Andreou *et al.*, 2017; Laudicina and Peterson, 2016; Vlado, 2020). Especially in the COVID-19 era, where digitization is accelerated with the possible loss of numerous job positions and professions, adaptation and innovation are fundamental development dimensions for all socio-economic organizations (United Nations, 2020). From a neo-Schumpeterian perspective, entrepreneurial innovation introduces and intensifies these changes as it leads to the emergence of new forms of capitalistic efficiency and profitability and the decay of the older (Chatzinikolaou and Vlado, 2019).

The current structural crisis of the global economy –which some analysts see as the fourth industrial revolution (Schwab, 2016) – is, ultimately, an evolutionary phase of capitalism, characterized by a continuous innovative transformation that readjusts the different correlations of power and the standards for efficiency, survival, and development (Vlado *et al.*, 2018). In this continually altering context, innovation enhancement policies must occupy a central role in making the economy and the businesses more competitive and driving the different socio-economic systems to novel and anti-crisis trajectories (Rinkinen and Harmaakorpi, 2019). This evolutionary approach to change is also the gravest issue that concerns evolutionary economics, attempting to understand the constant progress and transformation caused by the continuing innovation in the different socio-economic systems (Nelson *et al.*, 2018).

One of the best practices recognized by the literature to achieve novelty and higher competitive performance is to create a fertile innovation environment (Aydalot, 1986; Scott and Storper, 2003). The study of socio-economic reproduction of space in modern local development theory is gaining increasing interest. It explores the evolution of the internal and external business environment (Boschma and Frenken, 2006), penetrating at the same time into the firms’ internal organizational dimensions and to the structured external levels. In this sense, the notion of “glocalization” –global and local synchronically, which indicates that the process of globalization is not a linear expansion of the global territorial space– reveals that different local entities are capable of surviving by retaining their diversity within a context of globalized competition (Cecilia de Burgh-Woodman, 2014). Therefore, the

specific spatial socio-economic configuration creates and amasses (or not) innovative potential, whose enhancement is critical for the further advancement and sophistication of the co-evolving systems, subsystems, and organizations within the specific environment hosting their actions (Uyarra and Flanagan, 2010).

The theory of growth concentration in particular geographical areas has deep theoretical roots and, especially, in Alfred Marshall, one of the prominent ancestors of neoclassical orthodoxy in economic science, even though some scholars also notice the crucial heterodox sides of his work (Hodgson, 1993). Marshall's chapter on the concentration of specialized industries in particular localities generated the notion of industrial districts, which is determined as the gathering of groups of skilled workers who produce a large aggregate output of the same kind (Marshall, 1890). Marshall also noticed that a localized industry is not by definition a source of positive effects but could also be disadvantageous by employing only one type of work, thereby causing the factories to congregate in the outskirts of large towns and manufacturing districts in their neighborhood. Overall, Marshall identifies with this concept a fundamental source of generalized socio-economic development of each space. According to Becattini (1990), who revived later the idea, this industrial district is a socio-territorial entity in a historically bounded area consisting of a community of people and firms.

Therefore, economic geography has been an issue that has occupied the economic thought since at least the beginning of the 20th century, with the focus of study being the concentration of productive activities in specific localities. These polarization phenomena are some of the main conceptual components of the growth poles theory, whose initiation as local development policy can be found after the mid-20th century (Parr, 1999a). However, today, a paradigmatic change is underway in the economic geography domain, as argued by leading scholarly communities on the subject (Baycan *et al.*, 2017; Shearmur and Doloreux, 2015). Nowadays, emerging approaches transect the boundaries of otherwise distinct scientific fields and shed light on spatial issues by exploring the evolutionary and dialectical interdependencies between the different socio-economic actors (Koutsopoulos, 2011).

Consequently, contrary to the traditional polarization perspective of growth poles, new strategies appear that target the creation of localities that allow local firms to draw innovative benefits from a particular industry or other agglomerations and co-evolving networks of firms (Vlados and Chatzinikolaou, 2019b). In particular, the concepts of clusters and business ecosystems can be examined and compared to explore contemporary pressing issues of local development and respective policy articulation. This paper aims to investigate these three analytical classes and determine which parts adjoin as theories of space that can promote innovation in the different socio-economic systems and actors.

2. Methodology

This study researches these issues from a qualitative perspective and orientation, venturing on a general examination of the field by indicating and presenting fundamental theoretical points of contributions in the analytical frameworks of growth poles, clusters, and business ecosystems. In this context, an "integrative literature review" of the three analytical frameworks is used. According to Snyder (2019), there are three kinds of literature reviews: the systematic, the semi-systematic, and the integrative. A typical difference between the semi-systematic and the integrative with the systematic approach is that the former can qualitatively analyze the topic and set broad research questions, ending up contributing to a new theoretical framework. One of the elements that differentiate the integrative from the semi-systematic approach is that it can include other research besides articles, such as books or other published texts. Accordingly, in the integrative, broad, and qualitative literature review of this research, the following general questions are explored:

- i. What dimensions of these theories of spatial development and inter-firm connectedness can be cross-fertilized towards reinforcing innovation?
- ii. Which of these analytical elements and notions can be used for a specific policy of spatial development?

For the needs of this research, specific scholarly databases were explored. The "Scopus" database was used to search for the relatively recent growth poles literature (2010 and beyond). The keyword "growth poles" was used by distinguishing approximately ten research works that have this keyword in their title and are conceptual in their method. Next, the most cited literature of these recent works was discerned, ending with about another ten publications that constitute the field's fundamentals. The "disseminating" literature was examined for the analysis of clusters according to the terminology provided in Lazzeretti *et al.* (2014). Approximately ten publications before 2010 were picked and analyzed, together with another ten after 2010 that cite recent bibliometric analyses that focus on a literature review of the clusters' theoretical domain. For the study of business ecosystems, specific publications were located in the Google Scholar database, having in common that they cite Moore's (1993) founding work, they have a high number of citations and a conceptual character. In sum, approximately 20 articles were chosen to be presented.

In section 3, a general review of the existing literature is attempted, focused on the main theoretical dimensions of growth poles, clusters, and business ecosystems. The study aims to distinguish fertile and convergent elements from these approaches that can be used to articulate a new theoretical and policy framework of local development. In section 4, the prospects of creating and concretizing such an analytical structure are discussed. Finally, in section 5, the concluding remarks of the research are presented.

3. Evolution of the Basic Ideas in Growth Poles Clusters and Business Ecosystems Literature

3.1. Growth Poles

The concept of growth poles introduced around the mid-1950s as an effort to interpret the issue of polarized development in specific geographical areas. In the theory's foundations, the main idea is that growth manifests at poles of growth that combine innovations and investments centered on one leading industry, which dominates the affected socio-economic space (Perroux, 1955). From this foundational analysis, similar approaches and conceptual orientations begin, focusing mainly on the positive or negative spillover effects between localities.

Initially, Myrdal (1957) suggests that the positive spillovers from developed geographical areas into less developed areas do not counterbalance the spillovers of negative growth. At the same time, Hirschman (1958) states that an advanced territory can exert positive or negative effects on the less developed space if the two economies are complementary or competitive in structure, respectively. Then, Boudeville (1966) focuses on the idea that the growth pole is a large city composed of a propulsive industry that dominates all other economic actions and creates an industrial concentration of oligopolistic form. Subsequently, by following a similar thought pattern, Friedmann (1967) suggests that some core regions act as dominant centers of growth and economic change, while all the other areas within a given spatial structure are the peripheral ones. More recently, McKee (1987) perceives this "polarization dialectic" to induce existing growth poles' stagnation, whose adverse effects can be reduced by creating service activities.

By reviewing contemporary approaches, some divergence from the initial ideas that formulated this theory can be noticed. Christofakis and Papadaskalopoulos (2011), suggest that sectoral policies can attract propulsive activities that mitigate polar concentration. Smékalová *et al.* (2014) observe large municipalities as innovation growth poles that can concentrate economic activity and allocate entrepreneurship support, while Bere (2015) suggests that growth poles policies follow a top-down design to favor the creation of specific institutions. Godlewska-Majkowska *et al.* (2016), introduce the idea that a polarized region's core can also act as an "anti-growth" pole if it enhances crisis causes. Pysar (2017) argues that industrial concentration can turn some regional areas into growth poles that can increase the country's overall socio-economic competitiveness, and Strat and Stefan (2017) view the enhancement of the weakest geographical regions and industries to lessen the effects of polarization.

Therefore, growth poles continue as a conventional theory of regional analysis, in which the focus is the polarized industrial reinforcement of a territory or region, which are contrasted with respective spatial entities. The prevailing industry and its developmental perspectives in a regional area constitute the analytical epicenter because they lead to positive or negative spillovers that restructure the entire socio-economic space. In this approach, the economic system is perceived in terms of region, whose planning is exercised top-down necessarily, while the weakening of polarization between different territories is the desired result. In any case, one of the analytical virtues of growth poles is based on recognizing the structural importance of industrial concentration that can lead to the improvement of the overall developmental results at an extra-regional (national and international) level.

3.2. Clusters

The clusters of firms concern mostly the interactions between innovative socio-economic organizations that transform the geographical locations that host them. The clusters literature originates in the early 1990s by frequently citing Marshall's and Becattini's works. In this approach, the overall structuration of socio-economic development dynamics is perceived more accurately. According to the idea that Markusen (1996) introduces, a locally-targeted development strategy is not enough if it does not encompass a broader institutional analysis across different industrial districts.

Porter (1998;2000) is the author of two of the most cited scientific articles on the subject, defining the clusters as comprising a wide array of linked industries and geographical concentrations of interlinked firms and institutions in a specific field. These local groups constitute aggregations in a nation or region that involve highly specialized skills and knowledge, institutions, rivals, related businesses, and sophisticated customers.

The perspective of the "diamond" is also utilized in Porter's approach (Porter, 1990; Vlados, 2019b). This scheme presents a nation's competitiveness based on the four determinants of firm strategy, structure and rivalry, demand conditions, related and supporting industries, and factor conditions influenced by the two external determinants of chance and governmental intervention. Porter uses the diamond to measure the extent and level of national development based on a series of industrial clusters covering the entire economic activity. When a nation succeeds in having sources of competitive advantages in all determinants in specific industries, this fact ranks the country into the innovation-driven economy position, which corresponds to the highest degree of socio-economic development.

In the general perspective of clusters, McEvily and Zaheer (1999) explore further the procedures of knowledge and innovation dynamics by suggesting that the firms within geographical groups have a better position to access new knowledge if they can sustain network ties with specific regional institutions. Gordon and McCann (2000), observe different models behind spatial concentrations inside industrial clusters, both contradictory and complementary. For Malmberg and Maskell (2002), the collocation of firms undertaking similar activities increases the innovative potential. Bathelt *et al.* (2004), introduce the idea that a dynamic cluster has many actors with heterogeneous knowledge (a high quality "buzz") and extra-local knowledge sources (the "pipelines") that connect this spatial aggregation to the rest of the world. Storper and Venables (2004), suggest that geographical co-location (clustering) in high-cost urban centers generates highly skilled people and companies' agglomerations.

From a critical perspective, [Martin and Sunley \(2003\)](#) accuse the attitude of many policymakers around the world who have “seized upon” Porter’s cluster model as a tool for promoting innovation and growth without the desired results. In recent reviews of the cluster literature, [Lazzeretti et al. \(2014\)](#) distinguish the cluster’s multi-disciplinary and global dimensions as crucial features. [Hervas-Oliver et al. \(2015\)](#) indicate that the cluster literature intersects the discipline of management and economic geography by attributing increasing significance to the micro-foundations, while [Caloffi et al. \(2018\)](#) acknowledge the importance attributed to learning, innovation, and value generation. [García-Lillo et al. \(2018\)](#) underline the increasing interest and analysis of the processes connecting the cluster with global value chains, and [Lu et al. \(2018\)](#) the fact that current relative studies are stressing the significance of micro- and meso-level phenomena, while scholars and policymakers are gaining more knowledge of why clusters arise and decline. [Chain et al. \(2019\)](#) observe that the measurement of growth in these industrial clusters often occurs via analyzing the firms’ geographical concentrations and agglomerations.

Thus, from the cluster’s perspective, the evolutionary relations between industries and firms are of primary importance, with a particular emphasis attributed simultaneously to the sector’s meso-level and the micro-level of the strategic, technological, and managerial decisions and actions of the trans-spatial operating firms. Even though micro-level elements of diagnosis and development of entrepreneurship are introduced over the last years, clusters’ main contribution can be located at the necessity of creating global value chains from sophisticated local networks of technology, creativity, and knowledge diffusion ([Lee et al., 2018](#)). Thus, the clusters concept concerns the co-evolution between industries and businesses primarily. However, the notion of local development potential and priority remains relatively underutilized in analytical terms.

3.3. Business Ecosystems

The framework of entrepreneurial or business ecosystems constitutes one of the latest theories of spatial development. The concept of business ecosystems borrows biological elements to highlight the importance of co-evolving business ties from a cross-sectoral and global perspective. Initially, [Moore's \(1993\)](#) introduced the concept and noticed similarities with the respective biological ecosystem, whose primary function is to gather dispersed elements into a structured community. In the ecosystemic analysis, the business world’s organisms constitute co-evolving communities that must have specific leaders and shared visions ([Moore, 1997](#)).

The ecosystem metaphor ([Lakoff and Johnson, 1990](#); [McCloskey, 1998](#)), despite signifying the evolutionary interdependence between firms, it is also a strategic concept, in the sense that “keystone species” exist that define the overall progress of the business ecosystem ([Iansiti and Levien, 2004](#)). According to [Peltoniemi and Vuori \(2004\)](#), a business ecosystem is a complex and dynamic environment of interconnected organizations, irrespectively of their size, reach, and development potential. [Fragidis et al. \(2007\)](#) indicate that business ecosystems concentrate populations of organizations that do not belong in the same industry or supply chain even though they co-evolve and compete to attract resources and customers. According to [Li \(2009\)](#), a company can reposition its strategy to promote its interests and improve the ecosystem’s health.

Subsequently, [Williamson and Meyer \(2012\)](#) introduce the idea that business ecosystems are diverse networks of organizations that can benefit from building loose ties while retaining their corporate focus. [Zahra and Nambisan \(2012\)](#) point to the similarities between ecological and business ecosystems, which can both change and evolve towards unpredictable directions, which take significant time to materialize. [Rong and Shi \(2015\)](#) acknowledge that the participant organizations co-evolve with their environment in the business ecosystem, which has specific constructive elements and life cycle.

According to [Alvedalen and Boschma \(2017\)](#), entrepreneurship’s biological and ecological view helps understand the business ecosystem’s structure, whose literature also seems deficient in defining the evolving nature and spatial scale of institutions of the ecosystem. [Cavallo et al. \(2019\)](#) point out that entrepreneurship is the equivalent in the business ecosystem to the living organisms of the biological ecosystem, whose action is at the heart of the system. [Rong et al. \(2018\)](#) link the business ecosystem’s analysis with strategic management, systems science, and operational research disciplines. Finally, [Rinkinen and Harmaakorpi \(2018\)](#) set out new entrepreneurship nurturing as a business ecosystem policy’s policy objective.

Overall, business ecosystems’ evolutionary perspective concerns all the actors’ co-evolution that can lead the socio-economic system to continuous innovation. The micro-level interactions are especially noticed because the participant organizations’ strategy can transform their external environment and, consequently, their surrounding economic and social systems. Therefore, the specific space in all its manifestations is examined thoroughly in the integrated business ecosystem concept (local-regional and global configurations).

3.4. Towards a Conceptual Synthesis

Growth poles, clusters, and business ecosystems are spatial development theories that differ in their analytical center of gravity. Each one varies in scope, the actors it can mobilize, and policy objectives ([Table 1](#)). To this end, the following conclusions from the literature review can be extracted:

- I. Growth poles are about the “leading industry” that dominates the rest industries inside specific spatial agglomerations, while their driving force is local and regional polarization and geographical concentration. The actors are the firms in this leading industry within the region. The governance of growth poles is top-down, and the main policy objective is to mitigate or valorize the effects of negative or positive regional polarization at a national or international level.
- II. Clusters are about an array of industries whose actors are collocated firms. Their driving force is the agglomeration of high-development potential and innovative firms (usually in high-cost urban areas). Their

knowledge is specialized mostly, and their governance can be both top-down and bottom-up because they also concern their actors' capacity to innovate and evolve. The cluster approach's primary policy objective is to provide the structural links for the competitiveness of entire industries or industrial agglomerations by improving their surrounding conditions –supplying, customer, competition, and supporting needs– that cause and assist their continuous developmental mutation.

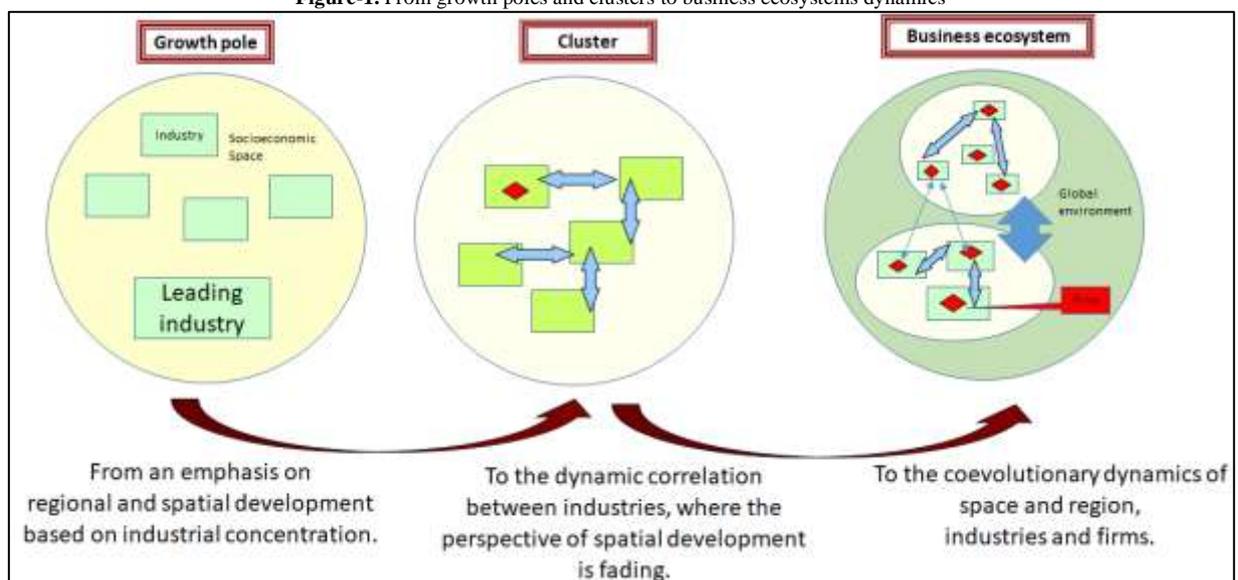
- III. Business ecosystems are about structured communities of co-evolving participant organizations. Innovation derives from co-evolving firms' strategies, and their governance comes from their leaders and their shared visions. Nurturing innovative entrepreneurship can be a policy objective to lead the business ecosystem to renewal and competitive survival.

Table-1. Theoretical and practical directions of the analytical frameworks of growth poles, clusters, and business ecosystems

	Scope	Actors	Policy objective
Growth poles	Leading industry	Firms in the leading industry	Mitigate or valorize the negative or positive polarization
Clusters	Array of industries	Agglomerations of firms	Specialized knowledge
Business ecosystems	Cross-sectoral	Co-evolving socio-economic organizations	New entrepreneurship and innovation

It can be pointed out from this literature review that the business ecosystem concept is more comprehensive than the other spatial development theories in terms of industrial scope; it may contain various industries, irrespectively of their competitiveness, size, and developmental prospects. In other words, the spatialized socio-economic system is treated as an ecosystem that shares elements with its biological counterpart, in which a multitude of “living beings” survive and compete. In contrast, the analysis of clusters is more linear in nature, as it takes shape as a relatively highly developed value chain in sophisticated spatialized socio-economic systems, in which the “weakest species” play a minor role until they acquire specific and more competitive capabilities. In the case of the analysis of the growth poles, this has its roots in older approaches to spatial development where the power of national champions in their strictly nation-centric contours was taken for granted. A quantitative depiction of the correlation between this dominant industrial dynamic and the other spatial economic activities is attempted in this analytical context (Figure 1).

Figure-1. From growth poles and clusters to business ecosystems dynamics



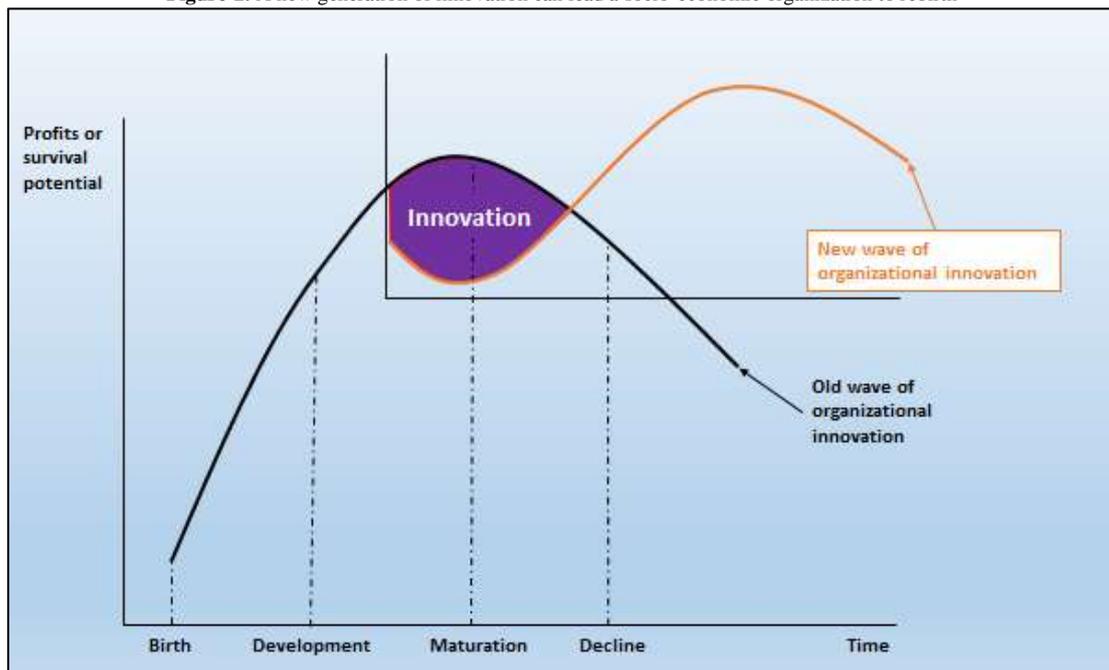
Therefore, it seems that an overview of the evolution of these analytical frameworks can show how the theory of spatial development is transformed over time, also expressed as a policy objective. The analytical class of growth poles was one of the first systematic frameworks of spatial development policy, focusing on the factors that cause growth and contraction. In this analysis, it is argued that the dominant industry leads to polarization throughout the region and that optimal policies should reduce this concentration. Later, the clusters approach emerged as a theory and policy that focuses on the simultaneous development of localized industries, on the one hand, and from a perspective of seeking specialized knowledge. The central argument to industrial clusters' analytical framework and policies is that these socio-economic and spatial aggregations interact with each other within the globalized system. The most recent business ecosystem approach, which focuses on the co-evolution of all the spatialized socio-economic system species, requires the multifaceted and “diagonal” strengthening of entrepreneurship as a necessary policy condition. Only business innovation forces can provide the potential for survival, development, and regeneration and renewal of the entire business ecosystem.

4. Towards a New Conception for a Business Ecosystems Spatial Policy

Economic growth differs from economic development. This distinction is necessary to understand the analytical value and perceive some of the fundamental dissimilarities between growth poles, clusters, and business ecosystems. According to [Perroux \(1969\)](#), the concept of growth signifies the aggregation of the broadly-defined product quantities, while development means the cumulative transformation of the economic system's qualitative and structural features.

The clusters and the business ecosystems constitute theoretical contributions in economic development mostly, and they continue to be used as policy instruments, as opposed to the view of growth poles, whose usage has been minimized ([Parr, 1999b](#)). Concerning the approach of business ecosystems, this draws elements from the evolutionary perception of economics, in which the exploitation of biological metaphors has significant analytical utility ([Zeleny, 1980](#)). In this economic analysis paradigm that borrows from biology, the ways of adaptation of the firms as socio-economic organisms in their external environment are studied ([Geus, 1997; Vladoš, 2019a](#)). In this sense, all firms experience a type of natural lifecycle of birth, development, maturation, and decline. A successful competitive adaptation and innovation can drive the system towards renewal –and this is the difference between the economic and the biological systems ([Figure 2](#)).

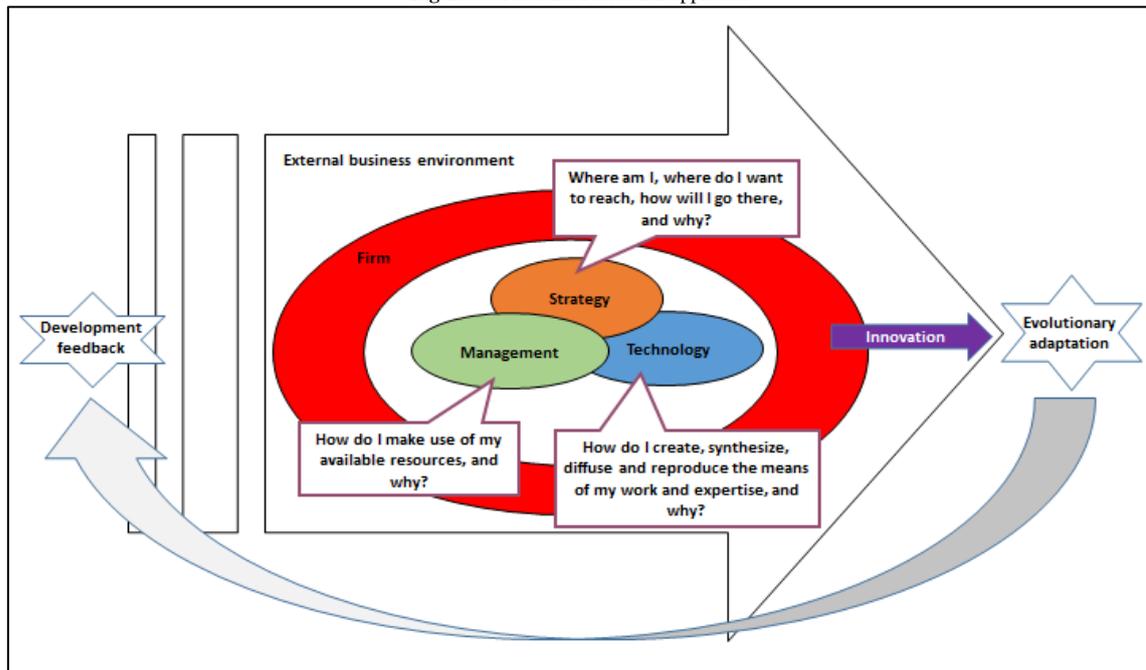
Figure-2. A new generation of innovation can lead a socio-economic organization to rebirth



This lifecycle pattern is common to all socio-economic organizations. A new generation of innovation can lead to the “rebirth” regardless of whether this is an institution or enterprise. From a Veblenian perspective ([Veblen, 1898](#)), institutions are also organisms that behave according to their environment's specific stimuli. To this end, following the “Stra.Tech.Man approach” ([Vladoš, 2004; Vladoš and Chatzinikolaou, 2020b](#)), the dialectic of three central forces within each socio-economic organization specifies its competitive survival and adaptability: the synthesis of strategy, technology, and management. The Stra.Tech.Man synthesis enables organizations to innovate and articulate their evolutionary physiology, following the environment's mutation that hosts them.

The Stra.Tech.Man physiology can provide an analytical spectrum to exploring the business ecosystem's operational modalities so that a corresponding policy articulation can effectively nurture the positive evolution of the entrepreneurial structures. More specifically, internally of each organization that is activated within a spatially-established socio-economic system, specific questions that concern the strategy, technology, and management are posed, either implicitly or explicitly, and define the potential for survival and development. The “where am I as an organization, where do I want to reach, how will I go there, and why” are the dialectical queries of strategy. The “how do I create, synthesize, diffuse, reproduce the means of my work and expertise, and why” correspond to technology. Finally, the “how do I make use of my available resources, and why” are the queries that concern the structuration and restructuring of management ([Figure 3](#)).

Figure-3. The Stra.Tech.Man approach



This evolutionary interpretation of innovation means that the way the socio-economic organizations succeed in answering these profound questions determines, over time, the level of development of the entire socio-economic system and that its evolutionary adaptation depends ultimately on the innovation that can create and re-create. In this evolutionary approach, the unfolding of history defines the organization's physiology dialectically and not just the will.

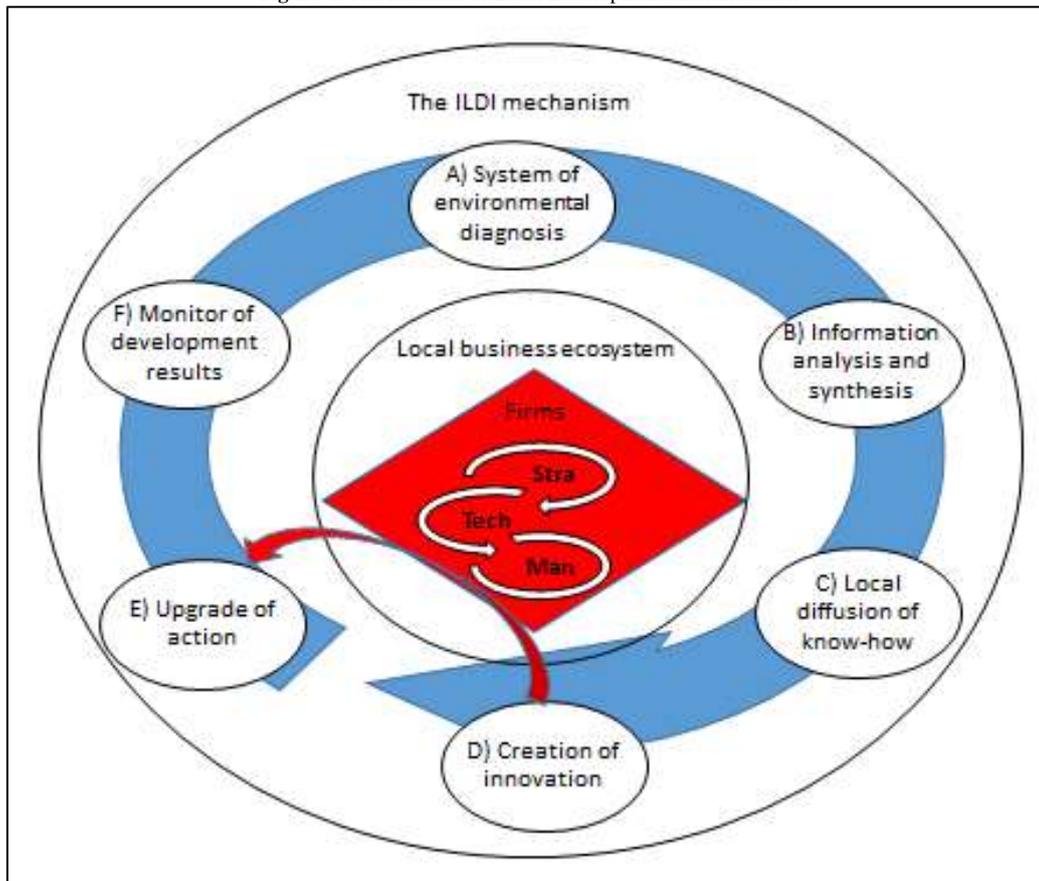
Contrary to this physiological perception of the firm's activity and behavior, in the strategic management literature and businesses' daily practice, some simplifying interpretations of the strategic vision and mission are expressed usually, where, allegedly, a bold and pompous statement can transform the entire organization. This mishandling can lead to strategic ambiguity or vagueness since there are no leaps of physiology in the lifecycle of any organism or socio-economic organization (Vlados and Chatzinikolaou, 2019a). In the Stra.Tech.Man approach, "hybridization" (Sarpong *et al.*, 2017) requires efficient syntheses of the three co-evolving spheres of strategy, technology, and management, within the readjusted and transformed continuously (and trans-spatially) socio-economic environment.

The enhancement of "Stra.Tech.Man" physiology, in practice, always necessitates initially the diagnosis of the level of development of the firms that constitute the business ecosystem. The ecosystem metaphor can be a point of reference because the practice of clustering is limited to already-developed socio-economic systems, while the concept of the business ecosystem can be valorized regardless of industry or previous development. The exclusively top-down perspective of growth poles also does not sufficiently analyze the "cellular" strategy, technology, and management of the different local actors.

In this direction, the evolutionary interpretation of business ecosystems can be used to introduce a new perception of boosting local development. The usual practice of local and regional policy, especially in less developed socio-economic systems, is limited to vertical means to subsidize specific industries and professions. The strengthening of only national or regional champions can be a myopic approach, which can lead to polarization since it does not consider all the socio-economic actors and determinants that participate in the creation and re-creation of innovation (Falck and Heblich, 2007; Hospers, 2005).

The Institutes of Local Development and Innovation (ILDI) can be a policy proposal that places the local business ecosystems and the firms at the epicenter, at the dynamic micro-level and intermediate meso-level of different regions and localities (Figure 4). This particular mechanism of boosting the Stra.Tech.Man physiology could follow a circle of six steps with the ultimate goal of creating innovation and upgrading the action of the local firm; that is, to operate as a "business clinic" (Aro *et al.*, 2013) that would welcome the "patient" (the firms) providing consulting based on diagnosing the level of development of the Stra.Tech.Man physiology.

In the first step, the ILDI mechanism could systematically diagnose the external environment in which it is called to act (A). Next, it could analyze and synthesize the information that collects (B). It could then diffuse the expertise that it already has acquired through informative local actions towards the firms and the other ecosystem actors, regardless of whether these entities have direct or indirect investment interest (C). In the fourth and fifth steps, the ILDI mechanism could be utilized as a carrier for providing consulting and training to implement best practices and strengthen the firms' innovative potential in terms of strategy, technology, and management (D and E). Sixth, it could monitor the complete mechanism's development results to reintegrate them into the environmental diagnosis system, restarting the circle of steps (F).

Figure-4. The Institutes of Local Development and Innovation

Different central or regional governments could follow the approach of the ILDI as a development policy mechanism focusing on the enhancement of the local or regional business ecosystem. In this context, [Vlados *et al.* \(2019\)](#) have suggested that this mechanism could work for the case of the less developed Greek region of Eastern Macedonia and Thrace and its small and medium-sized enterprises. For a comprehensive view of the actors that the ILDI can interconnect, the triple helix theory of the co-evolution of the institutions of universities, government policy, and businesses in the regional context can also be useful. Even though it concerns mostly developed regions where academic institutions exist, the triple helix's general framework shows that there can be no innovation in the modern society of knowledge if all three institutions do not communicate and co-evolve. Especially in its regional context, it is suggested that there must be an intermediating organization to assist the triple helix institutions in exchanging actors and resources ([Altaf *et al.*, 2018](#); [Metcalf, 2010](#); [Vlados and Chatzinikolaou, 2020a](#)).

In the triple helix, universities are not only involved in their traditional role of conducting and diffusing the results of scientific research, but they must be “entrepreneurial universities,” in the sense that their output must have high added value ([Etzkowitz and Viale, 2010](#)). On the other hand, the firms must necessarily reinvest a large portion of their profits in their internal research and development, offering their human resources lifelong education and learning. The omnipresent government intervention complements the system because it must compose the other institutional spheres and intervene selectively at all sides, horizontally, vertically, and diagonally ([Peneder, 2017](#); [Torfing *et al.*, 2012](#)).

In conclusion, the proposed ILDI mechanism introduces a perception of policy that could be applied in all kinds of business ecosystems. It does not distinguish the size of the firm or the ecosystem. It focuses on strengthening the firm's physiology and the specific ways the socio-economic organizations manage to synthesize the spheres of strategy, technology, and management internally.

5. Conclusions and Discussion

In this article, some of the fundamental spatial development theories were examined, focusing on the case of growth poles, clusters, and business ecosystems. Through the overview of different theoretical perspectives of these three analytical classes, it was identified that business ecosystems theory contains most of the necessary elements of the evolutionary approach that can be valorized in making policies for all socio-economic systems, regardless of their size or stage of development. This finding drove us to combine the biological view of business ecosystems with the Stra.Tech.Man physiology approach, in which it is suggested that the organizations are entities that synthesize the spheres of strategy, technology, and management to survive and innovate.

Especially when the mutations of business networks become increasingly fast because of the unfolding fourth industrial revolution –and the enormous global turmoil in the economic systems brought about by the COVID-19 pandemic– an approach of space that allows the socio-economic organizations to increase their adaptability potential is crucial. In this context, a policy proposal emerging by the business ecosystem concept was articulated, which can

be open to being exploited for all kinds of spatialized socio-economic formations by utilizing, in tandem, the triple helix approach.

Overall, the study's questions were (a) to what extent the analytical frameworks of growth poles, clusters, and business ecosystems can be cross-fertilized to enhance innovation and (b) how they can be exploited in the context of a novel policy for local development. To this end, the following notes can be extracted:

- a) It was proven that these spatial development theories have converging and complementary elements, although the ecosystemic perspective can deal with the issue of innovation more thoroughly. While the policy objectives of growth poles focus on the mitigation of polarization phenomena and while the respective of clusters on the achievement of specialized knowledge, which requires intensive investment in capital and R&D, the policies of business ecosystems concern all the actors and determinants that contribute to innovation and the creation of new entrepreneurship.
- b) The co-evolutionary perception of the different participants' activity in the business ecosystem concept allows the design of specific policies that could have utility in all socio-economic systems regardless of their development level. To this end, a composite policy proposal was articulated (the Institutes of Local Development and Innovation), whose center is the firm's activity and in which innovation is perceived in Stra.Tech.Man terms (strategy-technology-management synthesis). This mechanism's activation could lead the various spatialized socio-economic formations –and especially the comparatively weaker– towards their competitiveness strengthening to address their current crisis.

A thorough review of the spatial development theory was not attempted in this analysis, nor the empirical part of the growth poles, clusters, and business ecosystems approach was examined. Future research could assess the findings of the best practices of empirical studies on articulating policies based on the theory of growth poles, clusters, and business ecosystems, therefore testing even more thoroughly their analytical virtues, convergences, and divergences in the effort to achieve local development and innovation.

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