

# Transforming the Network of Co-Working Spaces for Start-Ups into an Open Knowledge Ecosystem

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**Abstract:** The paper focuses on the issues of transforming the geographically spread co-working spaces of start-up firms into the open knowledge ecosystems, i.e. hubs of growth-focused organizations characterised by sharing and generating new industrial knowledge. The presented insights are based on the combination of theoretical review and empirical survey of 92 managers of start-ups and SMEs in Lithuania. This is an emergent community of regional start-up firms with rudimentary linkages and elements of knowledge sharing. The paper looks into the key issues that could contribute to strengthening the knowledge-based collaborations and synergies in such community, while assessing both the current situation and the evolutionary potential of such collaborations. We present the critical discussion in the light of ecosystem-as-structure vs. ecosystem-as-affiliation (Adner, 2017) approaches. Ecosystem-as-affiliation approach stresses the affiliation of ecosystem actors (to the network or focal actor), while ecosystem-as-structure views ecosystem through the lense of value proposition that network actors are co-creating. The first view has a more open-ended network perspective where spontaneous collaborations may lead to different outcomes and the network welcome different members with no prior objective in sight. The second view is more focused on aligning the resources and activities of multilateral set of partners for materialising specific value propositions, and members are invited to join based on these specific needs. The research has shown that, on one hand, the emergent start-up community relies on institutional coordination while retaining the element of openness. On the other hand, there is an explicit need for leadership in building the shared vision and designing the knowledge partnerships for delivering the shared value propositions. One should stress the importance of focal organizations and boundary spanners - both in terms of the organizational and knowledge boundaries. The shared business interests, network leadership and trust have been identified as the key cornerstones for further development of network into an open knowledge ecosystem, yet they are also associated with the greatest challenges to sustained knowledge sharing in the network.

**Keywords:** Knowledge ecosystem, entrepreneurial ecosystem, complex adaptive systems, innovation ecosystem, entrepreneurial network

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## 1. Introduction

The development of effectively functioning entrepreneurial networks has been on the agenda of national and regional competitiveness policy actors for more than a few decades. It is widely agreed that joining into partnership activities with other firms allows start-ups to access valuable resources, specialised knowledge and information, gain market access and share risk. However, not all entrepreneurial networks evolve into fully-fledged ecosystems characterised by effective self-organization of actors, spontaneous learning and adaptation to the changing environment, free flow and exchange of information among actors, or manage to overcome the limitations of closed corporate hierarchies. It is even less common for the emergent networks of young entrepreneurial firms to form knowledge ecosystems, where „diverse actors bound together by a joint search for valuable knowledge while having independent agency also beyond the knowledge ecosystem“ (Järvi, Almpantopoulou, Ritala, 2018). Young firms face not only the resource constraints, but also limited absorptive capacity, which often prevents them from effectively capturing and generating new knowledge.

The aim of this paper is to discuss the potential of transforming the geographically spread co-working spaces of start-up firms into the open knowledge ecosystems.

The paper adds to the academic discussion in the field of entrepreneurial networks by adding the dimension of knowledge ecosystem, which is usually underexplored in research on entrepreneurship. Any discussion focused on ecosystems should consider their key parameters as complex adaptive systems (CAS), such as self-organization, emergence and non-linearity, autonomous decision making on the basis of local information, the importance of simple rules, the issues of system openness and its boundaries, etc. It is also important to note that research on social ecosystems (e.g. business ecosystems, innovation ecosystems, etc.) rarely include the above-mentioned CAS characteristics into their discourse (Jucevicius et al, 2021).

First, we discuss the concept of knowledge ecosystem and its key parameters that enable the effective generation of new knowledge in the loosely coupled networks of diverse knowledge actors.

Secondly, we present the key findings of study conducted in the emergent network of start-up coordinated through the regional hubs of co-working spaces by the national innovation agency of Lithuania. Survey covered 92 managers of firms participating in the network activities. The survey provides us with background understanding of the potential for the young network of entrepreneurial firms to evolve gradually into a more mature ecosystem where new industrial and technological knowledge is being generated. The key conditions for such emergence are presented at the end of the paper.

## 2. From network of entrepreneurial firms towards knowledge ecosystem

Over the past few decades, the concept of ecosystem has been extended from its traditional position in natural sciences into the realm of social research and the “ecosystems” of its actors (Winterhalder, 1984; Rothschild, 1990; Moore, 1993; 1996). Researchers analyse the conceptual similarities and differences of various ecosystems along their key parameters (Klimas and Czakon, 2020; Almpantopoulou, 2019; Jucevicius et al, 2021; Oh et al, 2016; Aarikka-Stenroos and Ritala, 2017). In the context of our discussion regarding the networks of entrepreneurial firms, three types of organizational ecosystems stand out: business ecosystem (Moore, 1993; 1996), innovation ecosystem (Adner, 2006) and knowledge ecosystem (Valkokari, 2015; Järvi, Almpantopoulou and Ritala, 2018). The first two can be regarded as already established perspectives, even if often criticised for still insufficient conceptual rigor and boundaries (Oh et al, 2016). *Business ecosystem* perspective stresses the co-creation of value among cross-functional and cross-disciplinary actors with their co-evolving capabilities (Moore, 1993). *Innovation ecosystem* perspective stresses the collaborative arrangements of firms that lead to coherent solution to the customer (Adner, 2006) and function as dynamically organized meta-networks (Carayannis and Campbell, 2009) that integrate research and commercial actors (Frenkel, Maital, 2014).

We can observe the general transition over the years in knowledge management (KM) research from its focus on improving the organizational KM processes towards developing the dynamic organizational knowledge ecosystems, which cross the organizational boundaries and enable innovative recombination of knowledge (Järvi et al, 2018; Almpantopoulou, 2019). *Knowledge ecosystem* perspective stresses the development of new knowledge from the interactions of diverse actors of business and research community (Dattée, Alexy and Autio, 2018; Järvi, Almpantopoulou and Ritala, 2018). Clarysse et al (2014) the different parameters of knowledge and business ecosystem and that they do not easily translate into one another. Powell et al (2010) studied the leading regional knowledge ecosystems to identify their common success parameters, which led to the description of three key factors of success: 1) *diversity of organizational forms*, which means greater variety of knowledge combinations and improved adaptive capacity of knowledge ecosystem; 2) *presence of anchor tenant*, which means providing private sector actors with public coordination and non-competitive interventions, and 3) the *mechanism for cross-realm transposition*, or *cross-network alignment*, which helps connect and align the diverse cultures, knowledge and professional networks. Networks of entrepreneurial firms should pay particular attention to these three parameters if they are to evolve into community that not only shares, but also creates new knowledge. The knowledge ecosystems can also be employed in the collective search for the solutions to complex problems that no single actor is capable of resolving on an individual basis (Jucevicius, 2022).

Adner (2017) makes a distinction between two different conceptualizations of ecosystems: *ecosystem-as-affiliation* and *ecosystem-as-structure*. The *ecosystem-as-affiliation* view emphasises the affiliation of members to the network or its central actor and has more open-ended perspective to collaborations where the boundary of ecosystem is defined by the spontaneous relationships. The *ecosystem-as-structure* view regards the network actors as purposefully assembled knowledge subjects (by their profiles) for achieving specific shared value proposition, which defines the boundary of ecosystem. Jucevicius et al (2021) argued that ecosystem-as-affiliation view is more comfortable with accommodating the parameters of complex adaptive systems. The CAS parameters include autonomy, localised decision making, endogenous or exogenous co-evolution of system actors (Mitleton-Kelly, 2003), self-organization and emergence (Lichtenstein, 2016), sense of identity (Mason, 2007), inter-actor trust (Carapiet and Harris, 2007) and openness to the external environment (Anderson, 1999) that enable continuous adaptation and learning (Parsons, 2007). In this paper, we also approach the emergent network by adopting ecosystem-as-affiliation rather than ecosystem-as-structure view.

## 3. Presentation and discussion of research findings in the context of emergent knowledge ecosystem

The research presented in this paper was conducted in the emergent network of diverse young firms that is coordinated through the regional hubs of co-working spaces established by the national innovation agency of

Lithuania. The network under study includes various start-up companies at different stages of development (yet established not more than 5 years ago). The coordinators of the network seek to improve the rate of start-up survival and support their growth through activities of knowledge exchange and learning. Firms also receive practical assistance through programmes of business acceleration, mentorship and e-commerce development. Coordinators also organize different business community events where valuable information, knowledge and experiences can be shared. The network members are also provided with practical tools for business diagnostics and e-guide platforms. They can use the infrastructure of regional hubs and co-working spaces for their business needs, such as meetings and workshops. The community-building events and training sessions are also taking place on a regular basis on the regional and national levels, which help build and maintain contacts among the members. At the moment, there are 13 regional hubs centred around the country integrating over 200 firms from diverse fields, such as ICT, creative industries, textiles and clothing, real estate services, foodstuffs, publishing and advertising, tourism, transport and logistics.

### 3.1 Methods of research

The empirical research primarily relied on the method of survey, which in the form of questionnaire was presented to all members of regional hubs. The questionnaire consists of 23 questions, most of them based on the Likert scale (1-5). The *aim* of the study was to understand the key drivers and barriers behind the inter-firm collaboration in the emergent network, with a particular focus on dynamics of knowledge and information inside the network (knowledge sources, flows, partnerships). Therefore, the key questions were related to finding out the main catalysts of knowledge sharing among partners, the sources of new knowledge generation, the roles of different actors, as well as the level of intensity of various processes, including those of knowledge sharing and co-development in the activities of the network. Answers to such questions allow us to assess the potential of the network to evolve from a set of regional hubs of young enterprises into more open and dynamic ecosystem of diverse actors that not only share, but also generate new knowledge. 92 managers answered the online questionnaire, making it a sufficient respondent pool for generalizations (from the general pool of around 200 firms).

### 3.2 Presentation of findings and discussion

Survey has shown that partnerships differ by their purpose, durability, object of exchange, and level of parties' interdependence (Öberg, Alexander, 2019). The different aspects of partnerships are also included in our research instrument (i.e. not exclusively focused on knowledge exchange). We can structure the research findings into three major conceptual blocks that represent three stages of knowledge management process: 1) partnership motives, 2) knowledge sharing: barriers and solutions; 3) assessment of knowledge-based outcomes of the network activities.

Study has shown that participation in the network enabled its actors to attract valuable intangible resources and support, finding new partners for business development. However, only 4 percent of firms under study managed to attract external investment into their business while participating in the network activities. When asked to identify their key business challenge the respondents emphasised the inconsistency in revenue streams (17 percent), lack of customers (14 percent), new product development (14 percent), lack of knowledge and competence (12 percent), and limited access to finance (12 percent). Network enabled firms to access the new business partners (1-3 partners – 49 percent, 4-6 partners – 21 percent, 7 and more – 12 percent).

The majority of firms under study can be referred to as fully or partly involved in innovative activities – as innovators or adopters of innovation: 28 percent of the respondents claimed that they are developing various innovative solutions in their business, while 50 percent tended to regard themselves as adopters of innovative solutions developed outside the firm. When asked about the nature of innovative activities, they stressed the adaptation of new technologies (42 percent), the creation of new products or services (23 percent), finding innovative channels or business models (9 percent), and development of new technologies (9 percent).

When asked to identify the key sources of new knowledge (by importance, from 1 to 5), managers stressed the role of customers (4,3), partners of network under study (4,1), trainings (4,0), and own employees (3,8). Observation of competitors (3,4) and market research data (3,5) were slightly less pronounced.

The motives to share own knowledge are clearly based on the expectations of reciprocity and business interests. The motives for the organizations to share their own knowledge are mainly reflected by the need to attract new knowledge (4,2), to adapt to the changing business environment (4,1), to provide better solutions to the

customers (4,1), and improve the functioning of business processes (4,0). Sharing of the risk (3,3) and resisting competitive pressures while strengthening the market power (3,2) are of relatively less importance.

Talking about other actors of the ecosystem that firms would primarily be eager to collaborate with in the network under study, the majority of respondents stressed research institutions (4,4) and sales partners (4,3), to a slightly lesser extent – investors (4,0). The interest in collaborating with other start-ups (3,6), business consultants (3,1) and training companies (3,1) was way less emphasised.

The managers were also asked to identify what knowledge was the most important to their firm. They stressed knowledge about the new technologies (4,0), human resource management (3,9), process optimization (3,9), new product development (3,8), and trends in the external environment (3,8). On the other hand, they found knowledge related to marketing (3,5) and sales (3,5) as relatively less important. However, as far as the knowledge and information accessed through their current network were concerned, the respondents stressed that they received mostly marketing (4,4) and sales-related (4,6) knowledge. The already existing access to such knowledge probably explains why their current needs in these areas of competence were less pronounced. Probably the greatest gap between the desired knowledge and received through their current network concerns knowledge about new product development (3,1) and process optimization (3,0). There is a good overall balance between desired and received knowledge in the fields of new technologies (4,0), trends in the external environment (4,1) and change management (4,0). Moreover, the absolute majority of respondents (74 percent) have agreed that their interactions in the network led to the creation of new knowledge.

It was important to understand what factors would be most effective at promoting the sharing of knowledge among the network members. Getting together the groups of members with similar business interests was considered as being of utmost importance (4,8), followed by the key role of leadership, i.e. identifying the leaders with strong social competences promoting trust and knowledge sharing (4,2) as well as leaders with strong professional competences to act as network coordinator (4,1). Although it is possible to expect a degree of self-organization among the members with shared business interests (3,9), the network leadership is regarded as relatively more important than relations emerging on the *ad hoc* basis.

Firms have chance to communicate with each other during regular network events (21 percent), joints training sessions and conferences (24 percent), less so while collaborating on the new product development (12 percent) or innovative activities (9 percent). On the other hand, when asked about the main motivators to join community under study, the respondents stressed the need to improve their capabilities in new product / service development (4,4). Thus, in this respect, we can see some mismatch in the practices of network members and their expectations from the network. The firms also want to discover opportunities to access and make use of new specialised information or equipment (4,2), improve the firm's reputation in the market and among partners (4,0).

It was also important to identify the key barriers to the sharing of knowledge in order to achieve innovative combinations for the development of new knowledge and products. Respondents stressed the following key barriers: lack of leadership among partners (4,4), diverging goals and interests of partners (4,2), and lack of trust among partners (4,1).

In Figure 1 below, we structure our findings along three aspects of knowledge partnerships in the network: 1) partnership motives; 2) barriers and solutions to sharing valuable knowledge and experience, and 3) assessment of knowledge partnership outcomes.

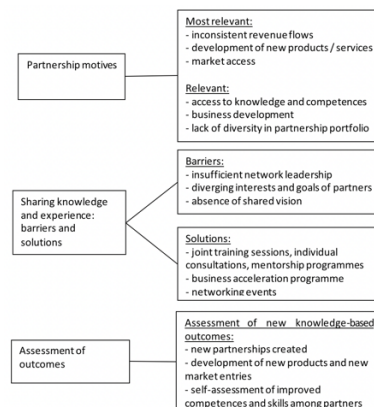


Figure 1: The key catalysts and obstacles of the inter-firm collaboration in an emergent knowledge network

Research has shown that at the moment the network can only be characterised as being at the early stage of development. One must consider that most of the start-ups in this emergent network have been established less than 5 years ago, thus they had little time to establish the mature and lasting linkages. The processes of inter-organizational learning and knowledge transfer are taking place in certain nuclei of firms that share business interests and build the initial trust. However, for wider scale collaborations and knowledge sharing to take place a stronger presence of network leadership that would foster trust and help coordinate relationships of diverse (yet complementary) business actors.

In order for the current network of small businesses centred around regional co-working spaces to evolve into open knowledge ecosystems several conditions have to be fulfilled. It makes sense revisiting and having a discussion around the key success parameters of regional knowledge ecosystems as identified by Powell et al (2010): *diversity of organizational forms*, *presence of anchor tenant*, and the *mechanism for cross-realm transposition*.

First of all, the *diversity* of network actors as possessors of valuable industrial and technological knowledge should be increased. In its current form, the network is dominated by the SMEs and public support organizations. Although it has some potential for sharing valuable business knowledge, it also needs to include research organizations if it is to evolve into knowledge ecosystem with greater potential for generating new knowledge as well as new industrial solutions that are based on such knowledge. Firms also stressed the importance of collaborating with research institutions for the development of new products and services, which so far did not receive enough attention in the current network activities.

Secondly, the processes of self-organization in the emergent network can be achieved, but they call for the *presence of anchor tenant* that would provide coordination and organizational / institutional leadership at all stages of the network formation. The role of network coordinator should be that of dynamic leadership sensitive to the evolving context of cooperation, i.e. it should be gradually changing over time as network evolves. Initially, it should be focused on establishing the shared business interests and knowledge bases of the potential network actors, and building the rudimentary trust. At later stages of more mature relations, the network leaders should act as facilitators of interactions that create communication spaces and maintain the level of openness of the network to the new actors. These are important preconditions for continuous upgrading and evolution of the knowledge ecosystem. At the moment, the network coordination mainly rests on public innovation agency, which may not be sustainable due to potentially unpredictable changes in policy and funding priorities. Therefore, it would be helpful to the durability of emerging network relations if other anchor tenants also emerge in the process. The role of anchor tenant can be performed both by research organization and by private enterprise with leadership dispositions.

Finally, the nature and type of institutional / organizational leadership has effect on the *mechanisms for cross-realm transposition*. In its current shape, despite some elements of knowledge sharing, the network under study is more an *ad hoc* selection of young businesses without prior experience of collaboration or knowledge transfer activities. They represent a variety of fields and types of knowledge, yet without pronounced leadership (outside the coordination efforts by public innovation agency), insufficient level of inter-organizational trust and potentially diverging business interests – all factors mentioned as the key barriers to knowledge sharing. The mechanisms for connecting the actors with their different knowledge bases may depend not only on the role leadership, the quality of trust building and coordination. It depends also on the presence of actors in the network who has potential to act as boundary spanners, i.e. those that are on the edge of different cultures, backgrounds, disciplines and knowledge fields. They can act as horizontal connectors rather than central coordinators.

The transformation of entrepreneurial network of firms into open and dynamic community of firms that is capable of generating new knowledge is a complex undertaking. It involves not only ensuring the quality of ecosystem actors (i.e. *diversity* of their profiles, competences, compatible knowledge bases), but also and in particular – the quality of their relationships. This quality is determined both by the presence of strong coordinating entities (*anchor tenants*), which act as standard setters, catalysts of trust and leaders by example, and by the adequate mechanisms of collective learning across the organizational, functional and disciplinary boundaries (*cross-realm transposition*).

The ecosystem-as-affiliation view suggests that it is important that the emerging ecosystem remains open to the new members, while at the same time maintains its sense of identity. The presence of network identity and shared value system that emerges over numerous iterations of meetings and discussions plays positive role in building trust, which in turn leads to more effective knowledge collaborations. Therefore, in order to perform

successful transformation into effectively functioning knowledge ecosystem, the network actors should not expect that the emergence of anchor tenant (e.g. strong public research organization or leading company) will automatically lead to easier coordination, more smooth knowledge transfer and spill-overs. The ecosystem may even become more vulnerable if it becomes too dependent on one or few dominating actors. The dominating “predators” (to use the analogy with natural ecosystems) not only define the boundaries of ecosystem, but in certain instances can reduce its internal diversity and hinder continuous self-renewal. Therefore, to ensure the CAS qualities of the knowledge ecosystem one always has to balance proximity with openness, coordination and control with autonomy and learning, complex interactions with simple rules, visionary perspective with the ‘small wins’ approach.

#### 4. Concluding remarks

The presented research of one specific networking initiative of entrepreneurial firms has revealed an overall good potential of gradually transforming the regional hubs of co-working spaces of start-ups into the open knowledge ecosystem. On the other hand, the opportunities are also accompanied with certain challenges. The firms under study are engaged in innovative activities either as innovators or adopters of innovations, which also involves sharing and generation of new knowledge. The knowledge sharing is based on a strong sense and expectation of reciprocity as partners, together with customers, are viewed as important sources of new valuable knowledge. Customers are regarded both as sources of knowledge, and as they key targets where the new knowledge has to be applied for better servicing the market needs. Therefore, one can state that knowledge sharing among partners has a degree with openness with regard to the market processes. The firms are also willing to collaborate with actors that are currently outside the existing network, such as research institutions. The shared business interests, network leadership and trust have been identified as the key cornerstones for further development of network into an open knowledge ecosystem. Paradoxically, the insufficiency in these three elements is also associated with the greatest barriers to a more intense knowledge sharing. The network leadership can take the shape of public or private anchor tenant that works towards ensuring the diverse yet compatible profiles of network members and their knowledge bases.

Research presented in this paper has been carried out in a specific sample of young business organizations that are part of public initiative in business networking, which is a limitation with regard to universalization of the findings. Our research was more focused on catalysts and barriers of knowledge partnerships in the emergent network, yet it would be instructive to adopt a more longitudinal approach to the dynamics – both growth and failure - of such network initiatives. We encourage adopting such an approach in future studies.

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