

Coworking spaces and the localized dynamics of innovation. The case of Barcelona.

Ignasi Capdevila

ignasi.capdevila@esgms.fr

ESG Management School

25 rue Saint Ambroise. 75011 Paris, France.

Abstract

The innovative capacity of cities does not exclusively depend on the innovation processes managed by local firms. This paper considers a multi-level perspective to analyze the crucial role of individuals and communities outside firms in the dynamics of innovation in cities. Through a qualitative study of the communities emerging in coworking spaces in Barcelona, we disentangle the different dynamics of innovation involving community insiders and local actors (firms, citizens and governmental bodies). We argue that coworking spaces act as intermediaries between creative individuals (“the underground”) and innovative firms (“the upperground”), contributing to the interaction between colocated actors through the articulation of places, spaces, projects and events. The results lead to suggestions for policies to contribute to the emergence and development of innovation in cities by fostering innovative processes outside firms.

Keywords

Dynamics of innovation; innovation in cities; coworking spaces, middleground; innovation communities

Introduction

Research on the dynamics of innovation that take place in urban spaces has generally focused on the study of the interactive learning processes of colocated economic actors (Malmberg & Maskell, 2006; Maskell & Malmberg, 1999a)□. This literature has acknowledged that both traded and untraded interdependencies between formal organizations contribute to a systemic effect in the processes of innovation, where different and diversified types of economic actors interact and collaborate to engage in innovative endeavors. Despite acknowledging the importance of the face-to-face informal and social interaction at the individual level (Asheim, Coenen, & Vang, 2007; Bathelt, Malmberg, & Maskell, 2004; Storper & Venables, 2004)□, current research has studied the localized innovation dynamics focusing the level of formal organizations and institutions. Research has often neglected the multi-scalar character of innovation (Bunnell & Coe, 2001)□ by ignoring the micro-scale of analysis in the innovation processes in cities. This micro-scale is composed by economic entities like individuals (entrepreneurs, freelancers and other types

of self-employed professionals), micro-firms, or communities. A recent research trend in economic geography has partially palliated this lack by underlining the importance of knowledge communities in innovation in territories (Amin & Cohendet, 2004; Coe & Bunnell, 2003; Cohendet, Grandadam, & Simon, 2010; Gertler, 2003; Henry & Pinch, 2000; Saxenian, 1994). These works have notably contributed to the literature on innovation communities by contextualizing them geographically. However, the question about how individuals and innovation communities participate in localized dynamics of innovation is still unclear. The contribution of this paper is to answer to provide an answer to this question.

This paper is concerned with the dynamics of innovation of emerging communities in collaborative spaces in urban environments and in studying how these innovation processes are embedded in the local innovation dynamics in the city.

To do so, we analyze how innovation practices develop in coworking spaces (CWS from now on) in the city of Barcelona. The level of analysis is purposefully multi-scalar in order to take into consideration individuals, communities and firms. Considering the role of CWS as an intermediary (“middleground”) between creative individuals (“underground”) and innovative firms (“the upperground”) (Cohendet et al., 2010), this study contributes to the understanding of the anatomy of innovative cities by disentangling the different ways the localized innovation processes develop in urban environments. We analyze the dynamics of innovation according to the concepts of place, space, projects and events (Grandadam, Cohendet, & Simon, 2012).

The structure of the article is as follows. First, the concept of coworking is introduced. Coworking is an increasing trend in the configuration of organization of independent professionals and small startups in urban environments. Second, we briefly review the literature on the dynamics of innovation in cities, considering the diverse of scales of innovation processes. Third, an empirical qualitative research analyzes the innovation processes in CWS in Barcelona, describing the dynamics among the members of the CWS on the one hand and, on the other hand, between the CWS community and the local urban environment consisting on firms, public institutions and neighbors. Finally, before concluding, we discuss the similarities of the dynamics of innovation in clusters and CWS and the implications of our study for policy makers.

The coworking phenomenon

The term coworking has started to be used as a buzzword and its meaning is far from clearly defined. Not all shared offices that use the term to define themselves can be considered as such. Defining CWS as “open-plan office environments in which they work alongside other unaffiliated professionals for a fee” (Spinuzzi, 2012, p. 399) do not consider one of the most important features of CWS, and that differentiate them from mere shared offices: the focus on the community and its knowledge sharing dynamics. Coworking.com defines coworking as: “a global community of people dedicated to the values of Collaboration, Openness, Community, Accessibility, and Sustainability in their workplaces” (Coworking.com, n.d.) and clarifies it:

“The idea is simple: independent professionals and those with workplace flexibility work better together than they do alone. Coworking spaces are about community-building and sustainability. Participants agree to uphold the values set forth by the movement’s founders,

as well as interact and share with one another. We are about creating better places to work and as a result, a better way to work.” (Coworking.com, n.d.)□.

Concerning this article, CWS are defined as localized spaces where independent professionals work sharing resources and are open to share their knowledge with the rest of the community.

The first “official” coworking space was founded by Brad Neuberg in 2005 when he organized Spiral Muse in San Francisco as a reaction of the lack of social implication of business centers and the unproductivity of working at home (Botsman & Rogers, 2011; Deskmag.com, 2013; Hunt, 2009)□. Since then, the coworking phenomenon has spread all over the world, converting the term a buzzword, with multiple definitions and uses. Currently, there are more than 100,000 people around the world that are members of one of the 3,000 coworking spaces running around the world (Deskmag.com, 2013)□. In Barcelona, for instance, more than one hundred spaces define themselves using the term coworking. In Europe as in the United States, there are annual conferences dedicated to Coworking where CWS managers meet, share experiences and discuss about common issues. There are several networks of coworking spaces that operate CWS in several locations, such as The Hub, NextSpace or Urban Station. Nevertheless, the majority of coworking spaces are small local private startups that run independently with only one or two locations. Some of them are organized in associations to offer more services and create more values for their members.

Being an emergent phenomenon, there are still few publications (Davies & Tollervey, 2013; DeGuzman & Tang, 2011; Jones, Sundsted, & Bacigalupo, 2009; Jones, 2013; Kwiatkowski & Buczynski, 2011a, 2011b; Nakaya, Fujiki, & Satani, 2012)□ and few academic research (Spinuzzi, 2012)□ dedicated to coworking.

Multi-scalar dynamics of innovation in cities

Innovation and firm size

Much research studying the locus of innovation in clusters has been concerned on the size of the organizations involved in innovation. With the end of the Fordist era, a renewed interest was put on the potential of small firms to innovate (Best, 2001; Piore & Sabel, 1984)□. Research on the dynamics of small companies showed that they allow a high degree of innovation to regions like the Third Italy (Amin, 1989; Trau, 1997)□, or Silicon Valley (Saxenian, 1994)□. Small firms have been acknowledged of being more innovative than large ones because they provided more flexibility and variability, thus improving their ability to build alliances and collaborate through projects (Acs & Audretsch, 1990; Birch, 1987)□. Networks of small firms might concentrate in clusters creating networks (Perry, 1999)□ that interact with larger firms as just-in-time production systems. The role of small and young firms has been acknowledged as being a crucial actors in generating economic dynamization of cluster and fostering the emergence of new businesses (Glaeser, Kerr, & Ponzetto, 2010; Henderson, 2003; Rosenthal & Strange, 2004)□. However, the literature has also identified strong clusters with the presence of larger firms that act as “anchor” firms that promote the emergence of spin-offs and attract new businesses to the cluster (Agrawal & Cockburn, 2003; Enright, 2000; Klepper, 2007; Scott, 1992)□. Regions with strong clusters

provide the needed diversity and reduced costs to start new businesses, and are associated to stronger rates of new firms and start-up employment (Delgado, Porter, & Stern, 2010). Clusters where large and SME have succeeded to establish decentralized innovative networks (Langlois & Robertson, 1995) may be able to develop competitive advantages in front of radical structural changes in the industry. In this line, the creation of “learning networks” -transversal structures where individuals of different organizations participate-facilitate learning and thus increase the overall localized innovation capability and pace (Bessant, Alexander, Tsekouras, Rush, & Lamming, 2012; Bessant & Tsekouras, 2001).

So far, we have discussed the role of firms’ size in innovation processes. However, research considering the multi-scalar character of innovation has also considered the role of actors outside firms. In the next section, we discuss the role played by individuals and communities in the localized innovation processes.

Middleground

Research on innovation in territories has traditionally focused on the externalities created among colocalized formal organizations (Breschi & Lissoni, 2001; Feldman, 1999) that are at the base of the development of ecosystems of innovation (Saxenian, 1994). However, innovation processes do not exclusively rely on the externalities between firms. The literature on innovation has shown the crucial role that users play in the development of new products (von Hippel, 2007) and consequently, firms have actively tried to capture the innovative value of external sources of knowledge and ideas (Chesbrough, 2003). Innovation communities create innovative solutions that are “sticky” (Lüthje, Herstatt, & Hippel, 2005; von Hippel, 1994). This local character of innovation outside firms is specially significant in cities and territories where there is a dense social interaction between actors (within or outside organizations) involved in innovative processes. This is specially relevant in the case of industries based on symbolic knowledge (Asheim & Gertler, 2006; Gertler, 2003), where commercialized products and services have a strong cultural component and are intimately embedded in the local culture.

The literature on creativity in cities (Florida, 2008; Hall, 2000; Landry, 2000; Pratt, 2008) acknowledges the importance of the a lively social and cultural open environment in the innovation in cities, by attracting talented professionals and innovative knowledge-based firms. This view describes the kind of individuals and firms involved in the innovative process in cities but do not explain how these processes take place. Further research has argued that the interactions between creative individuals and formal organizations are often done through communities (Coe & Bunnell, 2003; Håkanson, 2005; Henry & Pinch, 2000; Lissoni, 2001). The actors involved in creative and innovative processes in cities are structured following three levels (Cohendet et al., 2010; Grandadam et al., 2012). First, creative individuals and small informal communities focusing on exploration compose the “underground” (Arvidsson, 2007). The underground is mainly driven by intrinsic motivation and do not follow the market logics. Second, innovative cities host formal organizations and institutions that focus on the exploitation of creative endeavors. This level, defined as the “upperground” follow managerial and market logics, commercializing the outputs of the innovative processes. The third level, referred as the “middleground” plays the role of intermediary between the “underground” and the “upperground” (Cohendet et al., 2010). The middleground is composed by communities that, from the one hand, increase the

visibility of creative individuals and their chances getting hired by firms of the upperground and, on the other hand, represent platforms where firms of the upperground can get in contact with new knowledge created at the local level by the explorative activities of the underground. The interactions in the middleground are articulated through places, spaces, events and projects (Grandadam et al., 2012)□.

Places, spaces, projects, events

Places are venues where individuals can meet and interact in a formal or informal environment. Cities with a high density of coffee shops, restaurants, concert halls, museums, and other public spaces facilitate the interaction between heterogeneous individuals, thus benefiting the emergence of local innovation processes (Rantisi & Leslie, 2010)□. The constant flow of knowledge and information in places contribute to nurture a “local buzz” (Bathelt et al., 2004; Storper & Venables, 2004)□

In opposition to places, spaces represent cognitive constructions where individuals can interact and share knowledge (Amin & Cohendet, 2004)□. on the base of cognitive proximity and an absorptive capacity, that allows them to efficiently identify, interpret and exploit the new knowledge. (Cohen & Levinthal, 1990)□. Spaces are complementary to places. Spaces provide symbolic and cognitive meaning to physical places. Places reinforce the cognitive proximity of spaces with the geographic proximity, nurturing innovation (Boschma, 2005; Nooteboom, 2000)□.

Places and spaces represent platforms of local interaction on a permanent basis. However temporary forms of places and spaces can be created by organizing projects and events. Events allow local and distant actors to participate, thus facilitating the creation and maintenance of “global pipelines” that contribute to the circulation of (tacit) knowledge (Bathelt et al., 2004; Maskell, Bathelt, & Malmberg, 2006)□.

Events represent platforms where the innovations that have been locally created can be exposed and discussed with a larger community, contributing to its improvement and diffusion. Similarly, events provide the opportunity to local actors to get in contact with ideas, knowledge and innovation from external sources and territories.

Projects represent organizational structures that are particularly convenient to coordinate and integrate heterogeneous knowledge bases as it is the case in most creative industries (DeFillippi & Arthur, 1998)□ (ref). The temporary aspect of projects allow the implication of actors that are normally (geographically or cognitively) distant (Grabher, 2002a)□.

Research design

Research context: coworking spaces in Barcelona

Barcelona is currently the European city with a higher density of CWS (BBVA, 2013)□. Among other reasons, the explosion of the coworking phenomenon in Barcelona is related to the Spanish economic crisis. The high quantity of empty offices and corporate buildings due to the crisis pushed some owners and real-estate agents to try to monetize their spaces by proposing low-rent shared offices.

The distribution of CWS in Barcelona is not homogeneous. Most CWS are located in central areas of the city, concentrated in three districts: Eixample dreta, Eixample esquerra and the Old district. Two other districts, away from the city center, also present a high concentration of CWS: Gràcia and Poblenou-22@. Gràcia is a creative area with its own differential character. Several of the coworking spaces of Gràcia have created the association Silicon Gràcia, mainly to increase their visibility and attract foreign coworkers. The district of Poblenou has radically changed in the last 20 years, and has been transformed from an old industrial district into the innovation district of Barcelona, the 22@. Fig. 1 represents the geographic distribution of coworking spaces in different districts of Barcelona.

Fig.1. The geographic distribution of coworking spaces in different districts of Barcelona

The first CWS in Barcelona was launched in 2007 and currently, more than a hundred spaces in the city define themselves using the term “coworking”. However, not all CWS spaces are similar. As a representative of a governmental body explained, three different types of CWS can be identified:

There are different coworking spaces. We distinguish three types. Firstly, there is a kind of coworking that is the coworking based on real estate. This is about an entrepreneur or a private person that has an empty office or building and that want to get an economic return. He has typicality heard about coworking and he thinks that, by putting a sign on the door, will attract enough people to fill his space and earn money. If there are not certain dynamics in the coworking space, there is not a community that emerges, or nothing changes, I don't think that such a coworking space will be able to survive for a

long time. Secondly, there are these coworking spaces that believe in coworking and that create local community among their coworkers. This is a different model. We think that these ones have done well so far and that will do well also in the future. But we think that there is a third model of coworking, one that not only believes in coworking as a local community with physical proximity among members of the space but that also believes that coworking is a philosophy, a work methodology and consequently bets on the interaction among spaces. There are very few coworking spaces that believe in this third model. Is in this kind of coworking that we believe in. Is about the coworking that is about sharing, taken to its maximum exponent. In other words, the coworker is not only the guy working in this or that space, he is a user of a coworking space but he is convinced that sharing and developing contacts he will have a more important professional and personal development than working from home or working in a space with a limited or reduced community. Selection takes place in a natural way. New spaces will be created but others that do not share this philosophy will either evolve to this model or be forced to close. (Interview to a representative of the Catalan Government)

Our research focuses on the innovative processes in CWS. Thus, we have centered our study on the third type of CWS described above, as we detail in the following section.

Methodology and data

Method

We opted to base our research on a qualitative methodology. This kind of methodological approach is specially convenient to understand phenomena that are new or that have not been previously studied (Eisenhardt, 1989)□. In our case, the coworking phenomenon has not been so far theorized or little research has focused on its study and specifically on the innovation dynamics. Facing this lack of previous research, a qualitative methodology provides the optimal conditions to access richer and more dynamic sources of data than a quantitative approach (Marshall & Rossman, 1989)□. A qualitative approach is also indicated to study the enactment of theoretical models in particular cases (Van Maanen, 1998)□. In our case, the study aimed to understand how CWS act as intermediaries in innovation processes, to offer an empirical study of the concept of the “middleground”.

Sample

Through an internet search, personal contacts and a snowball strategy, we compiled a list of 118 CWS located in the city of Barcelona. All CWS were contacted by email and telephone, and finally the managers of 21 CWS accepted to participate in the research. Through a preliminary exploratory research three groups of CWS were differentiated, broadly corresponding to the three types of CWS above described. Table 1 summarizes our findings.

CWS type 1 No innovative communities	CWS type 2 Innovative communities	CWS type 3 Highly-innovative communities
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Studied coworking spaces codes	5 CWS (D, I, J, K, and M)	11 CWS (A, B, C, F, G, H, P, Q, R, S, and U)	5 CWS (E, L, N, T, and V)
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Table 1. Types of studied CWS according to their innovation characteristics

In order to better observe the dynamics of innovation, in this research we focused on the most innovative communities (type 3) following the suggestions of Patton (2002)□, that underlined that extreme cases provide a richer evidence on the research topic.

Data collection

The study is mainly based on two sources of data: semi-structured interviews, and direct observation. Secondary data like the content of the spaces' web pages, online forums and discussion mailing lists has also been taken in consideration.

Semi-structured interviews. The main sources of data were semi-structured interviews. Respondents represented two different groups, 1) managers and members of CWS, and 2) specialists of the innovation in Barcelona.

The interviews in CWS were done in two phases. In a first step, an exploratory research was conducted in the 21 different coworking spaces that agreed to participate in the study. In total, 28 interviews were done, most of them face-to-face in the CWS facilities. Interview questions focused on the individual activities, the collaboration with other members to innovate, the activities organized to foster innovation within the community and at a local level, and the type of interactions with external actors. This phase help us to identify the most innovative communities. The first phase also included interviews to nine to specialists from Barcelona that have followed the evolution of the collaborative spaces in the city n the last 20 years. These individuals were researchers, practitioners and policy makers that represented what (Eisenhardt & Graebner, 2007, p. 28)□ call “highly knowledgeable informants who can view the focal phenomena from diverse perspectives”.

Direct observation. The second main source of data was non-participatory observation of the community activities, most of them in the CWS identified as being the most innovative. In total, we conducted about 30 hours of formal observation and several more of informal observation. Following observations, notes were taken to build a more comprehensive understanding of the environment, the dynamics of innovation and interactions between the actors within and outside the CWS community.

Results

The results of our research on the role of coworking spaces in the localized dynamics of innovation show three different types of dynamics:

1. Internal innovation dynamics among the space members
2. Innovation dynamics originated by the coworking space community
3. Innovation dynamics originated by local external agents

These three types of dynamics are differentiated according the concepts of places, spaces, events and projects (Grandadam et al., 2012)□. Our results are schematically summarized in Fig. 2

Fig. 2. Localized dynamics of innovation in coworking spaces

Dynamics of innovation related to places

In the first place, coworking spaces are physical spaces in a specific location. The location (i.e. district), the physical space (i.e. distribution, size), and the material assets (i.e. tools, furniture) play an important role in the innovation dynamics. In general, the location and space characteristics are chosen by the founders of the space and *a priori* do not ensure that they will lead to innovation. Nevertheless, the “affordances” of such assets can allow informal interaction and benefit innovation (Fayard & Weeks, 2007, 2011)□. Physical places play also an important role in the face-to-face interaction between coworkers and external individuals, like neighbors, representatives of governmental bodies, and firms. For instance, on the ground-floor lobby of some coworking spaces there is a coffee shop / bar open to the public. These spaces are used by coworkers to relax and chat but also by neighbors and visitors, that interact with coworkers.

Fig 3 summarizes our findings about coworking spaces as being physical places contributing to innovation.

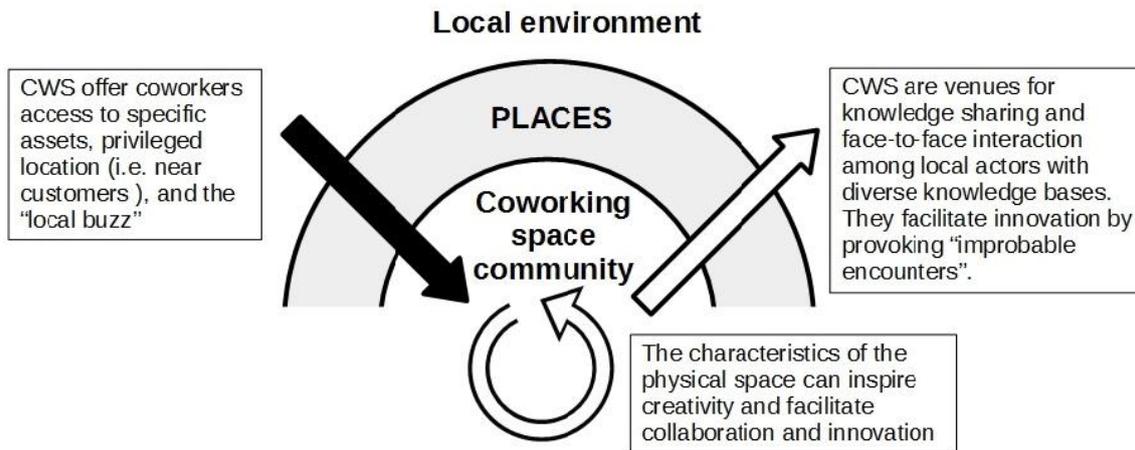


Fig. 3. Dynamics of innovation related to places

Location

Proximity from home is often one of the main reasons for coworkers when choosing a coworking space. An interest for a specific location might lead different types of people to share a coworking space. The face-to-face frequent informal interaction between neighbors with different knowledge and professional backgrounds in a working space offer opportunities to collaboration and innovation. In this sense, coworking spaces act as "third spaces" (Oldenburg, 2002) □, spaces of socialization at the local level that contribute to the social cohesion.

Coworking spaces also offer the opportunity to professionals from outside the city to take advantage of having access to an office in a central location to be nearer their customers or suppliers. This allow from one side, local coworkers to have access to knowledge from external sources, and from the other side, external individuals to integrate the "local buzz" and get in contact with the locally developed knowledge. This cross-pollination facilitates new professional collaborations and innovative projects.

Only me lives in this area. The rest of them [the other coworkers] are not from the neighborhood, not even from Barcelona, [...] This is a space that they have in Barcelona. All their clients are in Barcelona. When they meet them, they have this space to do the meeting. It is a way of not losing contact with Barcelona. They mainly come by train. We are in the city center. (Interview with manager of space I)

Barcelona is also an attractive destination for professionals and foreign companies. Nevertheless the professional integration of foreigners is often problematic (Leon, 2008) □. Coworking spaces offer a practical way to integrate a local professional community.

Barcelona is a city that likes to be capital of things, like football, mobile,... People like to come to Barcelona. We think that the attractiveness of other more mature [coworking spaces of our network] like the ones in Vienna, Berlin or Athens will help to create links and attract people to come here. (Interview with manager of space L)

Physical space

The distribution, the size and other characteristics of the physical space influence the innovation dynamics within coworking spaces. For example, space N occupies a five-store building, that members are free to change as they want. One of the managers explained the freedom given to members to experiment with the physical space:

There isn't any restriction about how to use the space. The only restriction is that another member might want to change what you did. [...] People take complete ownership of the space. There is no limitation. There is not a time limit or hours where the space is closed. If a meeting room is empty, you can use it if it is not booked [...] We create the space ourselves. We made the tables and installed ourselves the internet connection. [...] This capacity of generating and regenerating gives us a capacity to develop ourselves. (Interview with manager of space N)

According to a manager of a coworking space with a highly innovative community, large spaces are fundamental to run diverse activities simultaneously to facilitate innovative synergies to emerge. As he explains :

[Referring to the other coworking spaces of our network], Berlin has 3000 m², this one has 2000, Hamburg has 2000 and Sofia has 1500. Why did the one in Cologne failed? Because it was too small. [...] The coworking area is for one thing, the workshop is for another thing,.... Everything has to be in the same place. [...] In Cologne, they thought : « Let's do it small, and while we grow, we make it bigger ». But it didn't work. You have to do all this in parallel. (Interview with manager of space N)

Material assets

Some coworking spaces are created in order that members can share specific assets, as tools and machinery. For instance, in space D, coworkers take advantage of the powerful datacenter that is locally installed, sharing the high costs of purchasing and maintaining a datacenter while avoiding the risks related to data hosting in foreign countries. In spaces E and N a zone has been reconditioned to build a makerspace with machines to develop prototypes (like laser-cutters, 3D printers, etc.). The daily interaction with peers and sharing common practices and interests, contributes to the situated learning (Lave & Wenger, 1991), knowledge sharing and community building (Wenger, 1998) □

Dynamics of innovation related to spaces

Sharing and using specific assets in colocation facilitates the emergence of specialized communities around specific interests and practices. The members of such communities not only share places (in geographic proximity) but also share spaces (in cognitive proximity).

In figure 4 are represented the different localized innovation dynamics involving coworking spaces communities in relation with the notion of space.

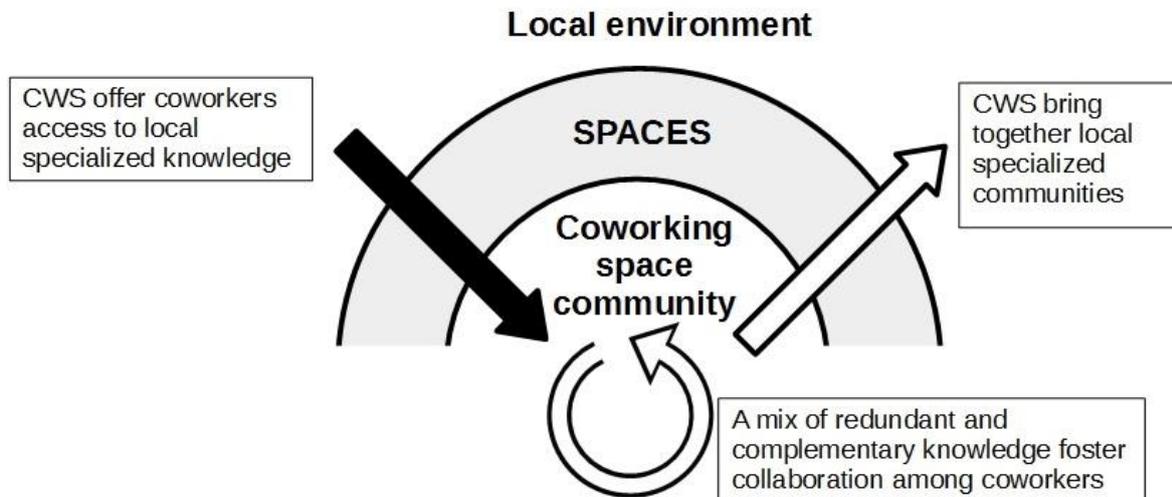


Fig. 4. Dynamics of innovation related to spaces

Coworking spaces are mere shared offices while others become hubs for individuals with specific interests. It is also common that non-specialized coworking spaces gradually specialize, either by a natural evolution of the community or by the intentional action of the managers of the space. “Places and spaces are complementary, with the former leading to the latter” (Grandadam et al., 2012)□.

Reasons for specialization might have different origins. In some cases, the will to specialize is related to the associated values, as it is the case of the space B:

The group’s leitmotiv is not to share space The leitmotiv is on the one hand a collective project on cooperation and on the other hand, to position ourselves in the social economy to offer services. The motive that drives us to collaborate is the social economy and the other reason, more social-economic is to have a cooperative group that gives us more potential and visibility and that allows us to do projects together. We are currently 34 entities in this space. The common characteristic is another way of doing economy. (Interview with manager of space B)

Developing cognitive spaces reinforces the collaborative and explorative practices of the members of the community around specific themes, as a manager forecasts:

I think there will be a specialization of coworking spaces: some are more technological, others creatives,... Spaces will no ling be open to all types of profiles but will specialize in architects, photographers, designers,... I think that to create synergies, there will specialize. (Interview with manager of space F)

Specialization of coworking spaces is not generally considered in a narrow sense. For example, in space D the focus is on information technology. In the case of space E, there is a broad interest on creativity:

We are interested in three strategic lines: 1) creativity and design; 2) innovation and technology; 3) entrepreneurship [...] All our members, about 120, fit in one of these categories, and also all our activities and events. [...] We are a community of people that want to do things but do not have resources, knowledge, or tools. But they do not lack energy nor passion. (Interview with manager of space E)

To be around peers allow coworkers to improve their specific capabilities while gaining new knowledge related to them. While sharing an important deal of common knowledge, coworkers also have complementary knowledge bases, that can derive to fruitful innovation though collaborations and knowledge sharing activities. Space A is specialized in communication and marketing. Nevertheless, the members' profiles are complementary rather than redundant, as the manager explains:

We have a graphic designer, I do social media and communication strategy.[...]Albert does agency planning and branding and Eric does market research. [...] We try that the members of our community come from the world of communication, developers, graphic designers, illustrators, public relations, marketing, etc. At present we would need profiles for a project that we are doing together. Some people of our community do not work here in the space. (Interview with manager of space A)

Developing a specialized community in a physical place contributes to attract other individuals with similar interest at the local level. A manager explains how a specialized local community emerges around social entrepreneurship:

So far, we have functioned as a normal coworking and now we start to have people that are interested to where we focus on [...] Now we start to be able to select people that do things similar to ours. [...] People will not come because we have a beautiful space, rather because here are happening things that interest them. (Interview with manager of space L)

Specialized coworking spaces nurture the creation of specialized communities at two different levels. Firstly, the coworking activities facilitate the emergence of an internal community that has a frequent daily interaction in the coworking space. Secondly, the space also contributes to the development of a larger community of individuals that interact in a more sporadic way with the internal community. Coworking spaces become local hubs of specific topics, where cognitive proximate individuals share knowledge and interact, reinforcing the local innovation.

Social innovation in Barcelona is extremely fragmented. [Our space] is a tactic argument to become a center of attraction. The coworking space is a way of bringing together. Events are another way of rallying the community. In our concept, coworking in an element, it is not the final reason. (Interview with manager of space L)

Events and projects allow to bring together actors with diverse backgrounds for a limited time. The temporary aspect of events and projects facilitate the participation of distant actors for a limited time, thus nurturing the creation of “global pipelines” of knowledge (Bathelt et al., 2004; Maskell et al., 2006)□. In the next sections, we present the role of events and projects in the coworking spaces in the local innovation dynamics.

Dynamics of innovation related to events

Figure 5 summarizes our findings about the role of events in the localized innovation dynamics.

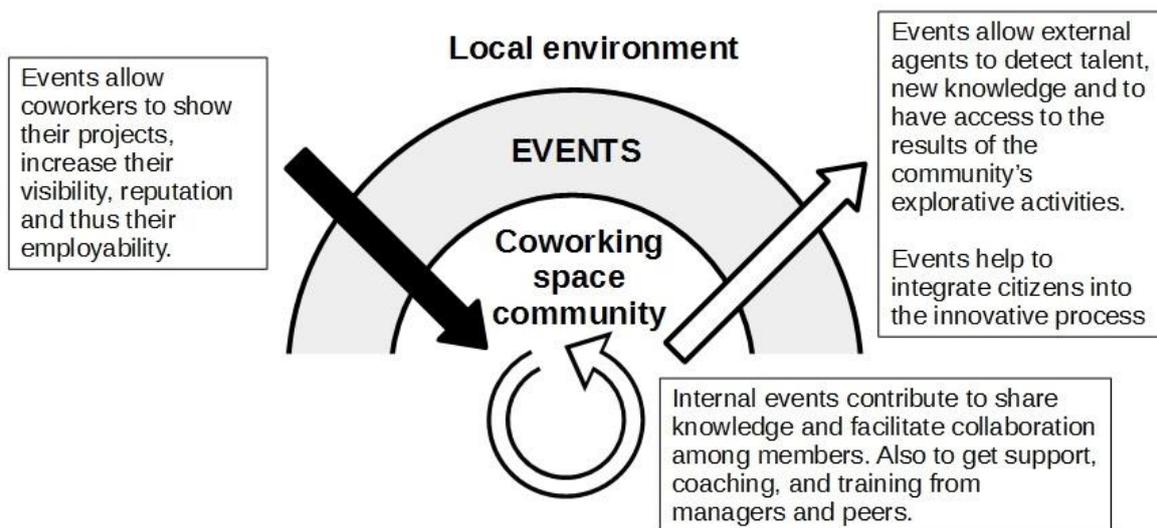


Fig. 5. Dynamics of innovation related to events

As we show in this section events open to external agents have different roles in the innovation processes than internal events organized exclusively for the space members.

Events open to the public

As it has been illustrated in the previous section, events represent a way to develop a larger community interested in a specific theme, beyond the boundaries of the space. Events contribute to enlarge the internal professional community, by integrating people from outside. The manager of a space focusing in social innovation stated:

There are members of the space that normally do not work in [our coworking space] but that pay a minimal fee to have access to the weekly conferences or other events (Interview with manager of space L)

Events allow space members to present their projects to external agents and firms to detect talent and have access to new knowledge derived from the exploration taking place in the coworking space.

We have done a lot of things with Mozilla, we have done a couple hackatons, we are working with [a Spanish bank], etc.[...] They all are interested because we have this community. Do they take advantage? They get access to talent. For instance, we organized a startup bootcamp at the national level, something very viral. There were 250 presentations in one day, with 11 winners. They come to look for talent. We have hidden people that don't know what to do with their talent. Firms funded the event, each winner won 30,000 Euros. We don't have sponsors, and we don't want them. We want funding for events, but without binding ourselves to a firm or city hall. (Interview with manager of space E)

The larger local community might also not be around a specific theme but be more generic, for instance to create bonds with the neighborhood and reinforce the district social cohesion. For instance, space C defines itself as a “center for resources for entrepreneurs and citizens”. One of the managers affirms:

We do not want neither a closed space nor a public space. But we wanted the citizens to participate. [...] we want to leave our footprint in the neighborhood. We organized an event with more than 2000 visitors. We want to improve the district's life. However, we don't have any public funding. (Interview with manager of space C)

Internal events

Internal events in coworking spaces are generally organized by the staff in order that the members give advice and support to each other. In some spaces, managers coach individually the members to advance in their projects. Through these meetings, the coworkers get to know each other better and to share knowledge. As a manager explains:

It is clear that if you want to advance in your project, you need a community that helps you to grow and to give you support. We saw that some people got stuck in very basic questions. We decided to create a small group to deal with practical issues. [...] Even if you are working on your own project, you need a community. It can make a difference if someone helps you with a contact or his/her own experience. It is not necessarily a collaboration but at least support. (Interview with manager of space F)

Dynamics of innovation related to projects

While events represent opportunities of knowledge sharing, projects allow the coordination and integration of diverse knowledge bases. Through collaborative projects, agents engage

in collaborative activities to reach an innovative endeavor. Members of coworking spaces develop projects within the space community as well as collaborating with external firms, individually or in collectively. Our results are schematized in Fig 6.

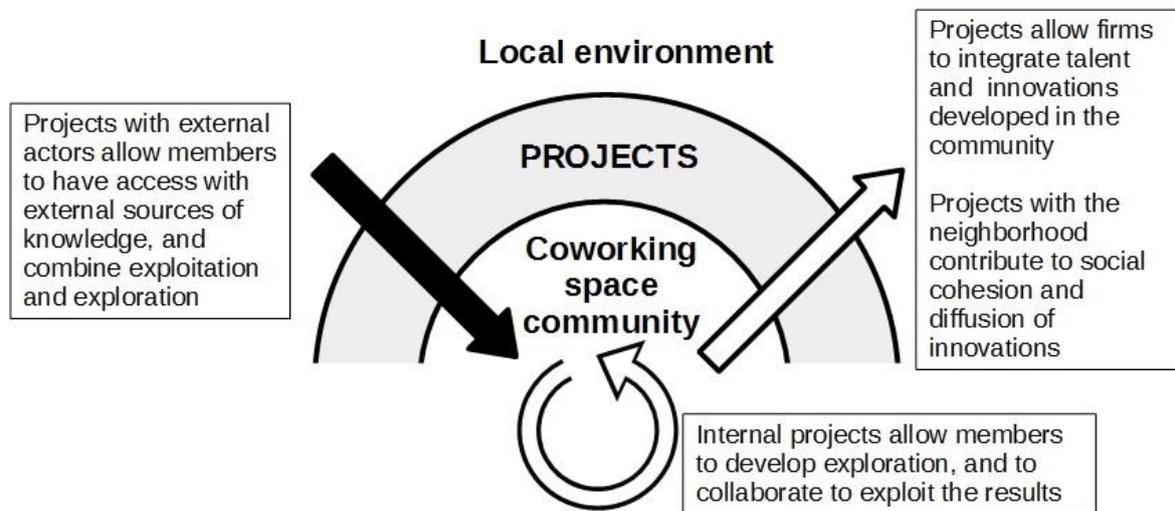


Fig. 6. Dynamics of innovation related to projects

Projects developed internally

Coworking space members might collaborate to develop projects in order to focus either on exploration or in exploitation to develop a product or service to commercialize.

Due to the diversity of knowledge bases present in coworking spaces and the mutual knowledge of the capabilities of other members, members collaborate to develop projects. These projects combine their different expertises and allow members to increase the services that they offer to their customers. In some coworking spaces, coworkers have successfully found ways of offering joint services by collaborating on a project-base. For instance, a manager explained:

Our company is not really a company, we are a group of independent professionals working o the fields of sociology, political sciences and psychology. Each of us works independently doing our own research. Because we do not want to work alone at home, we have created this network that implies that when you have a small project, you do it alone if you want but when the project is big or is a long/term project, you propose to collaborate to the other members of the network. [...] We count hours, complete transparency. If I do the customer management, I keep a part of the budget, and the rest is distributed by the number of dedicated hours. [...] The number of hours is agreed beforehand when we do the budget. As all this is very difficult o do at a distance, we share this space. (Interview with manager of space I)

In other cases, CWS members collaborate driven by intrinsic motivation to challenge themselves and engage in explorative practices. The following example illustrates the explorative character of the members of space N:

The app was done by the community in 36 hours. We wanted to do a hackathon in 36 hours [...] The idea was to do something where everybody could participate [...] They all are mega talented here and everybody was working together just like this, for the pure pleasure of doing it. It was done in 36 hours and uploaded on the Appstore. A guy calculated that to do that same app in a firm would have taken 5 or 6 months and cost about 100,000 Euros considering the senior expertise involved. (Interview with manager of space N)

As this example shows, the innovative capacity of certain CWS communities outperform the innovation in firms. This fact attracts firms to approach these communities in order to promote their products, search for talent to hire or to collaborate with the members to develop innovative projects.

Projects with external firms

The innovation dynamics involving both the CWS members and external firms are usually organized on projects. For example, space N has developed a highly innovative community. Their relationship with firms is also innovative. The CWS managers avoid sponsorship understood as getting free products or putting a visible logo at the entrance. Instead, they propose challenges and innovative approaches to reach win-win agreements, as a manager explains:

[An important bank name] came. They want to make an innovation department and they are looking for an innovative space. And a group came here from Paris. They wanted a talk about coworking. And I said, no, coworking no. Check the web. How many are you? 20. Do you want something innovative? Then, your 20 guys against our 20. How much time do you have? 2 hours. OK, then let's do a project in 2h, the [bank's] innovation department against 20 members of [our space]. The woman said that it was not possible. She flipped out. Now, they just called me back accepting. (Interview with manager of space N)

Some CWS also engage in projects with external agents with a more social focus. For instance, space L, that focus on social innovation, has engaged with the local community and social agents (ONGs and civic associations of the neighborhood) to promote social innovation initiatives in a depressed downtown district. As the manager stated:

The city hall is very good at city branding but not at taking their initiatives at a lower level. We can help to approach the top to the bottom, to the citizenship. And once we have done it in [this district], we can extend it to others. (Interview with manager of space L)

The interplay of the different dynamics of innovation

In the model of the localized dynamics of innovation, the different dynamics have been so far described separately. Nevertheless, our findings show that the four considered aspects (places, spaces, events, and projects) are intimately related and are interdependent in the development of the innovative processes. Nevertheless, the sequential or causal link between dynamics is not pre-determined and depends on each case.

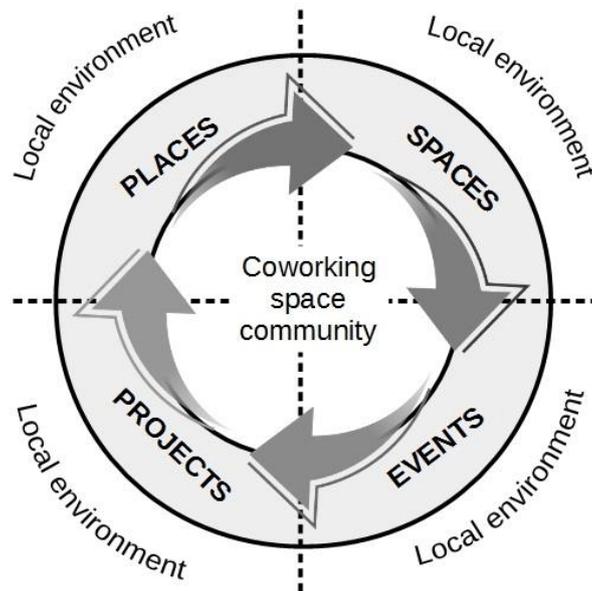


Fig. 7. The interplay of the different dynamics of innovation

Fig. 7 represents an example of how the four aspects are sequentially related but, as we show in these two short illustrative cases, the sequence of dynamics is not fixed.

Example 1: (Sequence: place → space → projects → events). In space N, the founders first rented a whole building in a lively district in Barcelona (place). The informal character of the environment, the intentional focus on collaboration and innovation, and low prices have gradually attracted creative coworkers (space). The community organizes an internal 36h-hackathon to developed an app for mobile phones (project). Finally, an event open to the public is organized in the space to present the app to 200 visitors (event).

Example 2: (Sequence: space → place → events → projects). A network of organizations focusing on social economy (space) decide to rent a large space to centralize all their different activities in the same venue (place). The different organizations (ONGs, associations, cooperatives) organize meetings (events) that create a constant flow of visitors. The co-location of a diverse pool of people facilitates the development of collaborations among organizations and also with external actors (projects).

Discussion

Our results show the multiscalar dynamics of innovation in cities. The locus of innovation does not exclusively relies on the firms or on the clusters of firms located in the territory but rather in the complex ecosystem of innovation dynamics that take place between different

levels. Cities represent pools of diverse and distributed knowledge that is created, interpreted and recombined at the level of individuals, communities and firms. Agents of the “middleground” such as coworking spaces serve as platforms to link creative individuals of the underground and firms of the upperground that benefit from the local external sources of innovation.

Research on the dynamics on innovation in territories has often considered the unit of the analysis of the cluster. Even though clusters are composed of firms of different sizes, the influence of the spillovers produced by actors outside market logics has usually been ignored. The dynamics of innovation that have been described in this article

This article contributes to the literature on innovation in cities by underlining the role that the middleground plays in the dynamics of innovation in a city, in particular CWS. Nevertheless, the comparison of the dynamics of innovation observed in CWS with the ones referred in the literature on clusters show parallelisms. The following observed similarities between the dynamics in CWS and in clusters are not exhaustive but illustrative of comparable phenomena at different scales:

Specialization and “localized capabilities”:

Clusters’ insiders are exposed to a large and diverse knowledge pool. Although each organization masters specific and limited capabilities, they can benefit of other members’ capabilities by collaborating. In this way, clusters facilitate the integration of diversity and the combination of complementarities contributing to the cross-pollination of different bodies of knowledge and expertise that benefit a cluster’s capacity of innovation and its differentiation through the creation of “localized capabilities” (Maskell & Malmberg, 1999a, 1999b)□. Similarly, the CWS that present a higher level of innovation, have specialized and have progressively developed a “localized capability” difficult to imitate and that represent one of the most valuable intangible assets of the community.

Role of projects and events:

Within clusters, the collaboration between organizations with different knowledge bases is promoted by a common institutional frame that reduces the cognitive distance and facilitates communication. However, the frequent interaction and interdependence between insiders can also derive in the long-term into the creation rigid structures of relationships leading the cluster to a lock-in effect (Maskell & Malmberg, 2007; Visser & Boschma, 2004)□.

To avoid such lock-in effect, projects and events represent a way of integrating new knowledge, ideas and innovation from external sources by nurturing the “local buzz” and diffusing the ones locally developed thus creating “global pipelines” (Bathelt et al., 2004)□. The role of these “temporary clusters” (Bathelt & Schuldt, 2008; Maskell, Bathelt, & Malmberg, 2004; Maskell et al., 2006)□ in the innovation in clusters present strong similarities with the role of events in CWS that we have previously presented in our findings. Collaborations within clusters are often coordinated in the form of projects (Grabher, 2002a, 2002b; Lorenzen & Frederiksen, 2008)□. Projects facilitate temporary relationships where complementary bodies of knowledge are combined to reach an innovative endeavor. Project-based interaction also allows to change partners with agility and to adapt to constantly changing markets. *Ad hoc* collaborations allow the integration of different firms’ capabilities and specialties ensuring the competitiveness of the involved firms and consequently their survival (Maskell & Lorenzen, 2004)□. Similarly, internal projects in CWS allow coworkers to

combine complementary bodies of expertise and increase their respective competitiveness in the market.

Summarizing, our findings show that CWS could be assimilated to “microclusters” that present similar dynamics of innovation than clusters, but at a lower scale. Whereas the unit of analysis of the cluster would be the firm, in CWS the unit would be the individual (considered as entrepreneur, independent professional or micro-firm).

Implications for policy makers

This article shows the impact of CWS as intermediaries between the “underground” and the “upperground” and their role in the dynamics of innovation in cities. The coworking phenomenon is relatively new and few policies have been aimed to study its effect on the innovative capacity of territories. Nevertheless, we consider that coworking merits the attention of policy makers as it can play a major difference in promotion of innovation in cities without implying neither a high cost or risk. Most CWS are private for-profit startups run by entrepreneurs that work in the shared office, in the same conditions as all the other coworkers. CWS are generally low-profit small businesses and it is not uncommon that founders combine the development of their own business simultaneously to the management of the CWS. In fact, the origin of the CWS is often the need of the founders to reduce their office rent costs.

Despite the low investment dedicated normally to the launch and management of CWS compared to similar publicly funded projects (like public business incubators), the outcomes of innovation within CWS do not only benefit the coworkers but also represent positive returns to the innovative capacity of the local environment. As we have shown, CWS contribute to the local dynamics of knowledge creation and sharing and can contribute actively in the local processes of innovation, linking talented individuals to innovative communities and firms.

In this view, policies that facilitate the creation of CWS and foster the relationships between them and the other local actors could lead to the local social and economic dynamization. Policies focusing on the creation of a favorable soil for CWS communities to emerge could represent an improvement of the local dynamics of innovation. For instance, these policies could communicate the advantages of coworking to independent professionals, offer fiscal incentives to CWS managers and members, or facilitate the launching of CWS in low-rent spaces. However, considering the autonomous and self-managed character of bottom-up communities, a too interventionist and directed policy could have counter effects and refrain the organic development of the community.

Conclusion

The cross-scale nature of innovation (Bunnell & Coe, 2001) implies that localized dynamics of innovation have to be considered at different levels. The literature on innovation in economic geography has traditionally focused on the territory level (nation, region, city) or organizational level (cluster, network, firm) without generally considering the role of communities or individuals outside firms in innovation.

This article contributes to fill this gap by considering the different levels involved in the dynamics of innovation in cities. The intertwined dynamics involve the formal and informal interactions between individuals, communities and firms. The study of localized spaces of innovation, like CWS, show that collective processes of innovation require platforms that allow the different involved actors to effectively communicate, share knowledge and cooperate. In our research, we show that places, spaces, projects and events facilitate crucial activities for the emergence and development of processes of innovation like, for instance, tacit knowledge sharing, diffusion of innovation, or coordination of diverse and complementary knowledge bases. Through these mechanisms, CWS contribute to the dynamics of innovation at different levels. First, at the individual level, members of CWS help each other and collaborate to advance in their professional activity. Second, at the community level, CWS represent specialized innovation communities that combine exploration and exploitation. As we have shown, in some cases these communities are able to compete with firms by coordinating heterogeneous knowledge bases. Third, at the firm level, the results of the explorative practices that take place in CWS can represent an external source of inspiration, ideas and talent for organizations. Fourth, at the local level of the district or city, CWS are platforms that bring together distributed knowledge around specific themes. CWS can also contribute to integrate the citizenship in collective innovation processes and acting as intermediary in top-down and bottom-up innovative initiatives. Fifth, at the global level, CWS host events that can represent “temporary clusters” where external actors can participate, sharing external knowledge and dynamizing the “local buzz”. CWS also welcome foreign workers, facilitating their professional and social integration in the local environment while offering local actors opportunities to get in contact with an external source of knowledge.

As a final comment, this article underlines that to understand innovation processes, individuals do not have to be considered as atomized actors but as part of innovation networks, communities and organizations. A cross-scale analysis contributes to fill a void in the current literature, that often ignores the constant shift of levels in localized dynamics of innovation.

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