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Global Knowledge Communities in Temporary Spaces

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Abstract

Although research in the field of economic geography addresses increasingly volatile, flexible, and dynamic economic environments in the knowledge economy, knowledge regarding the organization of economic and/or innovation-driven activities outside the boundaries of firms remains scarce. This paper addresses the phenomenon of open work spaces as a new type of organization in the knowledge economy. We refer to these places as “innovation and creativity labs”. These labs are designed as long-term organizations based on a physical/material frame. At the same time, they are primarily used as temporary spaces, whose users are defined by a dynamic social fluctuation and a high cultural openness. Despite being embedded in local contexts, open work spaces are integrated in global knowledge practices cultivated and generated in communities of practice. Based on an empirical study conducted in Berlin, this paper attempts to provide a typology for the variety of such new places. It discusses the role of such sites and places with regard to their temporary economic use. Furthermore, the empirical material will be interpreted in terms of how temporary uses and processes effect the transformation and (re)development of urban centers at large.

1 Organizing Work in the Knowledge Economy

Organization and management studies have shown an increasing interest in the concept of “communities” for quite some time (see e.g. O’Mahony and Lakhani, 2011). Respective studies emphasize communities as the focal unit generating knowledge rather than organization (such as firms). Such knowledge communities may emerge within, across, or outside of organizational boundaries (e.g. Brown and Duguid, 1991; von Hippel, 2005; Hagel et al., 2010). Communities are in this context conceptualized as “communities of practice” (Lave and Wenger, 2008 [1991]), which can broadly be defined as social entities consisting of people who are linked through joint enterprises, passions, or interests (Wenger 1998, cited in Amin and Roberts, 2008). Communities are thus perceived as learning contexts that generate knowledge through interaction and collaboration among its members, who contribute their respective expertise voluntarily to the shared topic of interest. Apart from the initial motivation of theorizing learning as a highly contextualized and interactive process (Lave and Wenger, 2008 [1991]), more recent studies shed light on the question how to organize and even “cultivate” (Wenger et al., 2002) communities as initiators of innovative practices.

But why are communities associated with such high expectations? Two basic assumptions can be identified: first of all, the genesis of new knowledge requires a constant flow of fresh insights and ideas. In comparison to traditional organizations, communities are regarded as the more permeable entities for the in- and outflux of new knowledge. In particular, the “boundaries” (Wenger, 2000) of communities are discussed as crucial since “learning opportunities” (ibid.) may occur wherever different communities overlap. Secondly, there is a growing awareness that new knowledge can principally occur everywhere: it is as likely to emerge in scientific laboratories as in enthusiastic online forums. A community perspective on this new form of generating knowledge therefore blurs established binaries between producers and consumers or between technology and design (see also Callon, 2004). Access to diverse knowledge domains and the creation of opportunities for recombining them becomes a new challenge for actors (including individuals and organizations) operating in the knowledge economy.

When focusing on the actors involved in creating new knowledge, two main trends become visible: first of all, firms and organizations increasingly implement an “open innovation” strategy (Chesbrough, 2003), which includes a partial opening of former in-house research and development processes to external entities. The integration of users and consumers by initiating “firm-hosted communities” (Jeppeson and Frederiksen, 2006) is widely discussed in the existing literature (e.g. Grabher, Ibert and Flohr, 2008; Dahlander and Frederiksen, 2012). Secondly, individuals increasingly organize their work outside the boundaries of a firm, for example as freelancers or micro-entrepreneurs (Grugulis and Stoyanova, 2011; Schmidt et al., 2014). These two trends are, of course, by no means unrelated. The increasing number of micro-entrepreneurs can also be regarded as resulting from changed employment strategies of large companies, which seek to stay flexible and (openly) innovative

(Boltanski and Chiapello, 2003). The underlying mechanisms and motivations are different. Large, functionally organized companies strive to integrate fresh external knowledge and competence into their organizations to loosen established routines and gain flexibility in terms of knowledge turn-overs. In contrast, individuals such as freelancers or micro-entrepreneurs have to position themselves in rapidly changing team constellations (Hafkesbrink and Schroll, 2011) as well as in large “sociality networks” (Wittel, 2001) in order to attract jobs. Put differently: while firms start to open up their organizational boundaries in a controlled and very strategic way, individuals *form* new organizational structures “in order to secure effective learning networks” (Schmidt et al., 2014, 234) and to participate in knowledge practices (Ibert, 2007). Hence, both sides face similar challenges in terms of organizing knowledge work outside the boundaries of firms and creating a social learning context. These challenges strike at the very heart of economic geography because the question of *how* directly implies the question of *where*. Surprisingly, this topic has been widely ignored by economic geographers despite the fact that the emergence of new spatial configurations for knowledge-intensive work, creativity, and even innovation-oriented activities has been observed. Particularly in urban areas new places such as “Coworking Spaces” or “Fab-Labs” have opened up. Simultaneously, global virtual communities such as *deskmag* (<http://www.deskmag.com/de>) for coworkers or the international *fablab association* (<http://www.fablabinternational.org/de/>) emerge. At the same time, companies begin to assemble research and development departments or incubators outside their original company sites, mainly in cities with the reputation of being creative. Our empirical research region Berlin offers great insights into this process because it provides a fruitful context for testing new business ideas and practices. In contrast to other cities, for instance in western Germany, the city’s economy is still in the development process, because both, West and East Berlin faced considerable economic transformations after the German reunification. The city is therefore an emblematic case for a dynamic, flexible, and volatile economic environment with above-average economic significance of the creative industries. To be more specific, 8,5 % of the city’s gross value added is generated by the creative industries (SenWTF/Der Regierende Bürgermeister von Berlin/Senatskanzlei, 2014, 4). In 2011, more than half of the working population in Berlin’s creative industries were micro-entrepreneurs (ibid., 81). Furthermore, Berlin is internationally recognized for its very dynamic start-up scene (ibid., 8) and hosts the image of the ‘place to be’ within an international freelancer economy (SenWTF/Landesinitiative Projekt Zukunft, 2013).

During the past ten years, Berlin has become *the* location for places that offer a spatial setting and infrastructure for such volatile economic conditions. We subsume these emerging new places under the term “innovation and creativity labs” and address them as new material structures seeking to instigate interdisciplinary collaborations. What differentiates them from traditional enterprises is their openness towards participants (including individuals that do not just seek for a place to implement income-oriented work, such as students, hobbyists, tinkerers) with heterogeneous professional backgrounds and their habit of granting ac-

cess on a temporary, flexible basis. Thus, social fluctuation and interdisciplinary constellations of actors are constitutive elements of innovation and creativity labs.

In this paper, we present and contextualize empirical findings conducted in two studies commissioned by “Projekt Zukunft” of the Berlin Senate Department for Economy, Technology, and Research (SenWTF) within the framework of the INTERREG IVC initiative “Cross Innovation”. In a first step, we took stock of existing innovation and creativity labs in Berlin through a desktop research and accompanying interviews (SenWTF/Landesinitiative Projekt Zukunft, 2013). Each lab is described along the categories of its ownership, users, openness, services and activities as well as spatial characteristics and infrastructures. Based on this empirical material we then developed a typology of five different lab formations (ibid.; Schmidt et al., 2014). In a further step, we conceptualized the “TED Tour Berlin ‘Labs as Interfaces for Innovation and Creativity’”¹ for “Projekt Zukunft”/SenWTF in June 2014. At this event, operators and managers of different European labs discussed opportunities, strategies, and challenges of the ‘lab movement’. Within the same workshop, interactive sessions were set up to fathom future potentials and risks of such labs (SenWTF/Landesinitiative Projekt Zukunft, 2014).

This paper discusses innovation and creativity labs in light of their impact on urban transformation by addressing the following questions:

- Do labs support knowledge-creating activities within communities?
- How do innovation and creativity labs transform urban structures?
- Where do fields of activity for urban policy emerge within this context?

The paper’s second chapter presents the state of the art of research dedicated to spatio-temporal configurations of knowledge creation. In chapter three, the methodological approach is described in more detail. Chapter four presents the empirical findings. In conclusion, the paper summarizes the main findings and addresses potential future research questions.

2 Time-Spatial Settings for Generating Knowledge

Analytically, two perspectives can be distinguished when looking at the relation between knowledge generation and space in economic geography (even though they often overlap).

The first perspective focuses on territories. With regard to the relation between creativity and space, it is in particular the work of Richard Florida (2004) on the “creative class,” which has led to a lively debate on intersections between urban attractiveness, creative professionals, and economic transformation (Scott, 2006; Clifton and Cooke, 2009; among many others). Of course, the “creative city” discourse is neither homogenous nor harmonious, but most of the research focusses on regions, cities, or urban districts as analytical units. Ilse

¹ “TED” stands for “Technology, Entertainment and Design”. TED is an organization which emerged out of a first conference in 1984 in California. The idea is to present and share ideas in an entertaining manner. The self-image of TED is to “change attitudes, lifestyles and [...] the world” (<https://www.ted.com/about/our-organization>; accessed 05.12.2014).

Helbrecht, for instance, describes physical proximity between creative workers in urban districts as a crucial “resource for generating new knowledge as well as for the acquirement and application of existing knowledge” (2011, 124; translation by authors). The district thereby becomes the central organizing and governing unit for creative work (ibid.). This argument is very much in line with Jane Jacobs’ (Jacobs, 1961) work, which defines the ‘city’ as diverse and structured by unplanned, yet creative encounters. Interestingly, the idea of innovation and creativity labs adopts classical urbanization effects (diversity, stimulating encounters, ‘sidewalk effects’) of cities and tries to transfer them to the micro-level of actual places. Though negative urbanization effects such as noise, density, or pollution are well known, labs are portrayed in a purely positive way within the lab discourse.

The second perspective is more procedural and focuses on arrangements for interactively generating knowledge such as inter-firm (e.g. Glückler, 2007) or project-based networks (e.g. Grabher and Ibert, 2006). Of particular interest is the coincidence of proximity and distance constellations within innovation processes (Boschma, 2005; Menzel, 2013; Grabher and Ibert 2014, Ibert and Müller, 2014). Currently, much attention is being paid to communities of practice within this research strand (e.g. Amin and Cohendet, 2004; Amin and Roberts, 2008; Faulconbridge, 2010; Müller and Ibert, 2014). This approach connects localized practices (Knorr Cetina, 2002 [1984]) with “wider constellations of practice” (Faulconbridge, 2010, 2855). For instance, physicists may be able to collaborate across large physical distances due to their membership in the community of physicists. They have a “shared repertoire of *communal resources*” (Wenger, 2000, 229; emphasis in original) and are thus able to understand each other, even without being co-present in the same location. In terms of generating innovation, communities are theorized as being able to absorb new insights in a productive way (von Hippel, 2005, 94). As early as 1934 Schumpeter (1997) [1934] already defined innovation as a new combination of existing elements. The abstract Schumpeterian entrepreneur is perceived as someone who has the ability to manage differences (see also Akrich et al., 2002, 188f.). However, economic geography has long been primarily interested in modes of specialization and proximity. This resulted, for instance, in research on economic and spatial clusters and cooperative and spatial structures between partners. The latter are understood to be similar (close) to each other, because they e.g. are co-located on the same industrial district or belong to the same economic sector. Recently, however, increasing attention is paid to constellations of “dissonance” (Stark, 2009), which are perceived as “opening opportunities for action” (ibid., 13; see also Ibert et al., 2014). It is in this context that Alvesson and Sandberg (2014) also criticize the strong specialization in scientific fields as conducive to “a narrow worldview” (968) and “unquestioned attitudes” (ibid., 974). They advocate “box-breaking research” as a strategy to scrutinize one’s own perspectives, which, in turn, might “increase[d] [the] likelihood of innovative ideas” (ibid., 977).

Using innovation and creativity labs as an empirical lens creates the possibility to simultaneously investigate territorial and procedural aspects in innovation and creativity driven economies. Labs can be conceived of as new physical and social structures that provide shared

workplaces and services on a temporary basis. We argue that labs are *new kinds of organizational forms*: They are *permanent physical structures* (Pohler, 2012) hosting *temporary stations* for entrepreneurs, hobbyists, project teams, and communities to work on and realize their ideas. So far, labs have gained little attention in the scholarly debate and available studies mainly analyze labs from a micro-perspective. Lewis and Moultrie (2005), for instance, regard them as “a physical research setting dedicated to conducting specific types of experiment” (74). Similarly, Magadley and Birdi (2009) focus on the physical setting of labs in order to analyze their capacity to “create a certain ambience that allows creativity to flourish in an environment that is stimulating and non-threatening” (ibid., 315). While labs have attracted little attention yet, more thorough scientific discussions unfold on “Coworking Spaces” (e.g. Lange and Wellmann, 2009; Olma, 2011; Dzudzek, 2012; Merkel, 2012; Pohler, 2012; Spinuzzi, 2012; Brinks, 2013; Merkel and Oppen, 2013; Stumpf, 2013; Saraco, 2014). Within the listed literature, Coworking Spaces are regarded as specific types of temporary work places designed primarily for digital workers. Instead of analyzing their physical setting in detail, available studies mainly highlight the social function of shared working environments for micro-entrepreneurs who otherwise would mainly work alone in their home offices.

However, labs should not solely be theorized from a micro-perspective. On the one hand, their rapid growth can only be understood by connecting the emergence of local labs to activities of global communities promoting and enhancing the idea of coworking and otherwise shared spaces. Through international virtual platforms as well as international and local conferences, lab operators co-create community norms that are then laid out as “coworking values”² or the “fab lab charta”³. Of course, that does not mean that every single lab engages in such activities. And yet, the individual lab users are definitely members of wider knowledge communities. Müller and Ibert (2014) raise awareness of the geographies of knowledge generation within communities by emphasizing the relation between locally situated knowledge practices and non-local ‘cultures’ of practice. The latter enables links between physically distributed community members. Thus, extending the analytical focus to a perspective of labs as “local nodes” (Gertler and Levitte, 2005) or even as *local anchors* of knowledge generated in global communities appears as a promising and even necessary approach when trying to grasp this particular phenomenon.

We address, to sum it up, innovation and creativity labs as new spatial-temporal configurations, which are characterized by flexible access and hybrid constellations of actors. We regard them as new facilities for organizing work and knowledge-generating activities in the knowledge economy. Labs match the components, which are discussed as crucial factors of the process of generating innovation, above all community-orientation, open innovation, and interdisciplinarity. However, despite the general acknowledgement of such places, little

² <http://coworking.com/> (accessed 23.10.2014)

³ <http://fab.cba.mit.edu/about/charter/> (accessed 23.10.2014)

is known about their societal context, their organizational structures, the actor's objectives, and the concrete activities taking place in labs. Moreover, their potential effects on urban development and regional innovation policies are nearly unexplored.

3 Research Approach

This paper builds on data collected in the context of two studies on innovation and creativity labs carried out on behalf of the "Projekt Zukunft" initiative of the Berlin Senate Department for Economy, Technology and Research. In spring 2013, we conducted extensive online research for taking stock of existing innovation and creativity labs in Berlin (Sen-WTF/Landesinitiative Projekt Zukunft, 2013). In order to be applicable to our research lens, innovation and creativity labs had to fulfill the following criteria:

1. *Openness*: the lab must be accessible to a diverse group of users
2. *Flexible workspaces*: the lab must provide temporary workplaces, ranging from hours to months.
3. *Collaboration*: the lab must be designed to facilitate collaboration; this criterion includes the physical infrastructure (shared rooms, etc.) as well as the existence of social formats which strive to foster interaction among the users (workshops, events, shared projects, etc.).

Each identified lab was described along above criteria, which then allowed us to develop a classification according to the labs' governance mode (its hosts, users, management model, organization, and moderation mechanisms), lab objectives, addressees/users, industry focus, accessibility, as well as its offered activities, services, and its infrastructure. Context interviews allowed us to understand the framing conditions and location demands for each of these innovation and creativity labs.

We, in addition, conceptualized, documented, and analyzed the "TED Tour Berlin 'Labs as Interfaces for Innovation and Creativity'" in June 2014 on behalf of "Projekt Zukunft" (Sen-WTF/Landesinitiative Projekt Zukunft, 2014). The workshop aimed to initiate a debate among lab providers and city/regional administrations regarding both the potential and the challenges of innovation and creativity labs within urban economies. The workshop also addressed policy issues, asking how identified challenges need to be addressed by policy makers and how identified potentials can then be supported. The workshop invited experts from across Europe (Amsterdam, Barcelona, Berlin, Linz, Stockholm) and initiated a discussion among the audience, which consisted primarily of an international group of TED-organizers. Subsequently to the workshop we conducted five follow-up telephone interviews with the lab-experts from the workshop, who had also co-moderated a session on the potential and challenges of labs. With the help of the interviewee's interpretation and background knowledge, we then formulated our policy recommendations.

4 Labs and their Role in Urban Economies

To empirically analyze the emergence of labs entails challenges that can be traced back to the highly fluid nature of a concept, which is still in the process of being developed and defined. Hence, the field entrance could not build on a rich conceptual background. Therefore, the following chapters are arranged as follows: firstly, we will describe the variety of lab formats to be found in Berlin. We then outline constitutive lab features that crystallized in the workshop above mentioned. We will in this context discuss why an increasing number of labs is founded and what they are primarily used for. Finally, we will describe their impact on urban economies.

4.1 Typology and Inner-city Location of Labs in Berlin

The Berlin-based case study identified 53 innovation and creativity labs (survey date: spring 2013), which fulfilled the criteria for labs that were outlined above (SenWTF/Landesinitiative Projekt Zukunft, 2013; Schmidt et al., 2014). Each lab was described in terms of its key features, such as ownership, activities, and services offered in the lab as well as its exchange and collaboration formats, its moderation, economic orientation and its user composition. Based on these profiles we developed a range of diverse lab types. Grassroots initiatives that are very much oriented at do-it-yourself movements exist alongside coworking labs that rent out technologies and services and are thus based on a business model similar to that of coworking spaces. In addition, we found firm and academic driven labs that create an environment designed to implement open innovations. Finally another lab type is created for incubation and accelerator programs that address start-ups and start-up teams. These various lab types clearly differ in terms of their “degree of openness”, their “organizational structure”, and their respective “actors’ (both, operators’ and users’) objectives”. Thus, we distinguish three synthesized lab categories that are presented in the subsequent section. For each category, we outline their specific location patterns in Berlin (based on Schmidt et al., 2014).

Experimentation Labs: grassroots initiatives and coworking labs offer an environment for experimenting with ideas, tools, and materials. They are characterized by low access barriers with almost no formal restrictions for participating (Schmidt et al., 2014). Hence, experimentation labs accommodate the largest variety of user purposes. They are mainly founded/initiated by private groups of individuals, without the involvement of larger organizations or investors. While grassroots labs can be understood as environments for hobbyists, enthusiasts, and do-it-yourself practitioners (or “makers”, Walter-Herrmann und Büching, 2013), coworking labs have a stronger economic orientation since they primarily address freelancers, micro-entrepreneurs, and start-ups with a higher demand for flexible workspaces and infrastructure, and who are sometimes even in need of a professional business address. Furthermore, coworking labs are generally run as profit-oriented business models whereas grassroots labs are mainly organized as non-profit entities (Schmidt et al., 2014).

Due to their roots in private initiatives, the latter presumably possesses the lowest capital endowment of all observed lab types. Thus, these labs depend on affordable spaces within their local neighborhoods and are sensitive to price pressure weighing down on real estate in urban districts. At the same time, the potential users of this lab type are very inner-city oriented and prefer locations that they not only perceive as modern, fashionable, and “in”, but that also fulfil a combination of functions (working, living, playing, meeting etc.). In Berlin, we identified a concentration of grassroots and coworking labs in the districts Neukölln, Wedding, and Kreuzberg, all three of which are known for their creative culture and (still) affordable spaces. Experimentation labs often (re)use vacant locations and thereby gradually contribute to the transformation of these urban neighborhoods.

Open Innovation Labs: Open Innovation Labs are initiated either by firms, academic or research and development institutions. Compared to experimentation labs, the degree of openness is significantly lower and much more selective. Users are consciously selected by the labs’ operators who seek to access external knowledge and competencies complementary to their own innovation strategies. These labs are therefore very controlled and geared toward specific topics related to the core business of the host organization. The overall aim is to enrich internal development processes with external knowledge (provided, e.g., by users, clients, partners, freelancers, start-ups, researchers, etc.) in order to, firstly, identify upcoming trends in market dynamics and, secondly, enhance the transfer of ideas into marketable products.

Open innovation labs initiated by firms („firm-driven labs“) are often intentionally established in physical distance to the original firm, in some cases even in another city. Berlin is a popular destination, chiefly because of the city’s prominent reputation as a creative metropolis. It is for this reason that firm-driven labs choose inner-city locations with an established creative image, such as Berlin-Kreuzberg. The Telekom Innovation Laboratories (T-Labs) may be the most prominent example. The Telekom’s headquarter is located in Bonn (North Rhine Westphalia), while the labs as well as the partnership with the Technical University of Berlin is located in the German Capital. Academic-driven Labs are initiated by academic institutions, often in cooperation with private partners. In contrast to firm-driven labs, academic labs tend to be located in close proximity to the academic unit that originally set up the lab. Thus, these labs can mainly be found in the vicinity of research campuses and close to academic institutions such as the Technical University of Berlin in Berlin’s district of Charlottenburg. In contrast to experimentation labs, open innovation labs are presumably less sensible to changes in real estate prices. Furthermore, in the case of academic-driven labs, it can be assumed that lab locations are often already owned by host organizations.

Investor-driven Labs: Aiming to detect new, profit-promising business ideas, various forms of investor-driven labs, such as incubators and accelerators, have opened up in Berlin. Their main target group are entrepreneurs, start-ups and start-up teams within the growing sector of the digital economy. The labs are primarily managed by venture capital providers or large companies (Schmidt et al., 2014). Access to these labs is directly controlled by the lab opera-

tors who select users according to the operators' evaluation of the commercial potential of their business ideas. The lab users are supported by the host organization which, in return, is usually granted a share of the start-up's turn-over or, alternatively, ensures that it shares partial rights to the intellectual property of the beneficiaries' business ideas.

Investor-driven labs are mainly found in exposed areas of the city. A strong spatial concentration of incubators and accelerators is visible in Berlin-Mitte and Kreuzberg. Furthermore, they are often located in historical buildings like the "Umspannwerk" in Kreuzberg, a former electric power transformation station, which is now reused as an urban event location. Interestingly, experimentation labs and investor-driven labs resemble each other with regard to location patterns although their capital endowment, their organizational structure, and their motivations are vastly different. This apparent contradiction is a typical example of the ways in which urban districts are reinterpreted and reused as creative spaces, a transformation that often leads to a conflict of interests and instigates debates regarding the legitimacy and the rights of ownership and use of urban spaces.

4.2 The Labs' Functions in Urban Economies

The following section summarizes the main results of the international expert-workshop "*Labs as Interfaces for innovation and creativity*" (SenWTF/ Landesinitiative Projekt Zukunft, 2014). They should be interpreted as a first attempt to grasp the significance and function of a new spatial and organizational phenomenon.

"**Transdisciplinarity**" is one central buzzword in the lab discourse and can be regarded the overall aim of lab initiatives. The demand for transdisciplinarity is powered by the assumption that recent societal challenges are more complex than they were in the past and thus "out of the box thinking" (Alvesson and Sandberg, 2014) is required to develop adequate solutions. Consequently, strong disciplinary foci and strict sectoral boundaries that lack mechanisms to make knowledge available to the wider society and adaptable to public issues are criticized within the lab movement. It is important to note that the critique is not directed towards specialization and disciplinary expertise per se, but rather addresses missing *intermediaries* to connect different components of specialized knowledge. The described theoretical assumption that the emergence of innovation requires "collision structures" (Olma, 2014; translation by authors) is very common within the community of lab providers.

In contrast to "push-innovations", lab movements support a "**pull-innovation**" logic (Hagel et al., 2010). "Push" and "pull" refer to the modus of reflexivity in generating knowledge. In the "push" logic model, actors seek to expand an 'ex ante' defined body of knowledge by following specific rules and by implementing evaluative practices (Müller and Ibert, 2014). "Pull" logic instead identifies problems that occur *in practice* and may be solved by developing an 'innovative' solution directly in an application context. Thus, *trial and error* become central ways of generating knowledge in labs. Transdisciplinarity is inherent to the "pull" logic as actors frequently cross and utilize boundaries of knowledge domains (ibid.)

Labs position themselves as **interfaces** between different societal spheres such as the economy, the sciences, and the civil society. Labs usually follow a pre-defined vision such as enabling citizens to use seemingly complex technology. The term “empowerment” is frequently used in this context and encompasses at least two dimensions: first of all, it refers to the acquirement of production facilities, which were formerly reserved to the big industries. Accessing tools such as 3D-printers or laser cutters are emblematic examples of this dimension. The second aspect refers to the active integration of users and consumers in product development processes. This is what von Hippel (2005) describes as “democratizing innovation”. From this perspective, labs are perceived as facilities that redistribute *control* over production and technology processes and can further be regarded facilities that open up room for democratized innovations.

Time and temporality are further constitutive lab elements. The socio-economic genesis of knowledge economies is accompanied by the increasing share of the economically active population, which no longer works in long-term employment forms. A high degree of flexibility and the capability to deal with uncertain labor market developments and risks is required from knowledge workers. Labs address these uncertainties by offering a likewise flexible use of their new work spaces. Offices and related equipment are no longer rented out on long-term bases, but rather rely on short-term contracts. Additionally, lab operators become important intermediaries who orchestrate encounters among users as well as between users and external entities. These new, often unpredictable encounters, pave the way for new combinations of knowledge (see also Olma, 2012 “serendipity machine”). From the perspective of involved firms, labs offer a new way to access external knowledge pools more easily and use them according to their own interests. Before this background, labs in urban environments take on following functions formerly associated with other economic and social actors.

Labs as Tools: Usually, labs are arranged in a modular design and equipped with ‘tools’ that are conducive to the experimentation with and the application of ideas. The actual infrastructure depends on the labs’ objectives and its addressees (user structure) and thus differs from lab to lab. However, some tools have become constitutive for particular types of labs. For instance, 3D printers and laser cutters are basic elements of every “FabLab”. For each project, these tools can be newly combined so as to cater specifically to the respective project. In that way, they may just as well be used for experimentation as for the first physical realization of ideas such as the actual production of prototypes and small-series.

Labs curate openness: The desired mix of diverse user groups within labs is achieved by seemingly low entry barriers. However, the high degree of social openness does not signify an entirely uncoordinated gathering or unlimited access to these ‘shared’ places. Instead, labs are carefully ‘curated’ and encounters are actively “provoked” (Brinks, 2013; translation by authors). Furthermore, labs develop thematic foci that in turn limit potential user groups. Creativity, science, and technology can be regarded as the labs’ dominant orientations. As a consequence, their social composition does in no way represent the societal average. Inter-

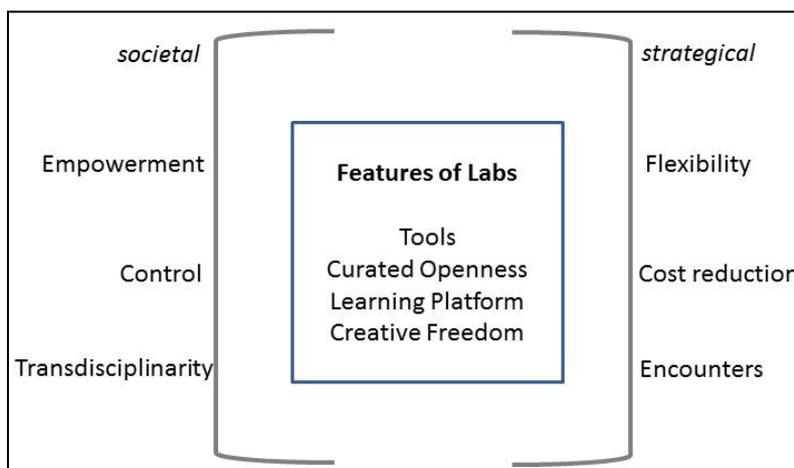
estingly, women seem, for instance, to be highly underrepresented. The labs' way of identifying topics, selecting addressees, exposing and promoting events and products are only a few ways through which they facilitate and create a particular image of themselves.

Labs are learning platform: Labs also offer various formats of interactive learning. These formats can be both collaborative, for instance in the form of workshops or seminars on certain topics, and competitive, through "pitches" where start-ups and their respective business ideas compete against each other. Regardless of how the learning platform is implemented, its existence plays a crucial part in fostering the collaboration within labs.

Labs offer creative freedom: Creative thinking needs physical environments that facilitate and support an unconventional take on established routines. This feature highlights the role of labs as being complementary to organizations with fixed boundaries particularly because they are not designed to rehearse everyday working routines, which represent the core of firm's activities. Hence, labs can only provide and proliferate the idea creative freedom as long as using them does not become a routine in and of itself. At the same time, creative freedom also relies on a certain *independency* between the expected results and the experimental processes within the labs that are designed as a means to achieve these ends. Of course, these dynamics are highly contradictory since each lab is subject of specific interests and expectations from both the lab users and its operators.

The central characteristics of labs are summarized in figure one. The figure shows that these characteristics are fluid and hybrid constructs, which in fact combine elements that seem contradictory at first glance. Obviously, labs are situated in the context of flexible labor markets and may be interpreted as new discursive disguises of hyper capitalistic structures, which work toward the self-exploitation of knowledge workers (see for example Boltanski and Chiapello, 2003) or, on the contrary, express the individual's increased opportunities to build bottom-up initiatives and participate actively in the economy.

Figure 1: Contextualization of the labs and constitutive features



Source: own graphic

Labs can be contextualized within the 'brackets' of more strategic and more societal motivations. Strategically, labs not only offer flexible workspaces, but might also be conducive for initiating and utilizing contact between potential business partners. On the societal level, labs are imbued with 'values' such as empowerment, control, transdisciplinarity, and a negotiation of the labor market's uncertainties in volatile labor markets (Schmidt et al., 2014). These aspects are, of course, neither exhaustive nor universal. Instead, the described attributes could, first of all, be defined as self-portrayals and as the objectives of lab operators, which surely have to be studied in more empirical detail. In our view, however, labs offer an interesting research lens on spatial phenomena of innovation and creativity-driven economies that have yet to be adequately recognized in economic and urban geography.

4.3 Labs as Temporary Places for Global Knowledge Practices

Labs are not organized alongside professions or economic sectors but rather in accordance with shared ideas, projects, and topics. Their general quality lies in their ability to work with interdisciplinary teams and communities and apply their work *temporarily* to a local context. The mobile and multi-site nature of knowledge creation (Ibert et al., 2014) is therefore explicit in taking the concept of labs into account that even shapes this in an organizational form. This requires a rethinking of the local and regional level with regard to innovation. Within the context of innovation and creativity-driven economies, labs offer structures of opportunity, create complementary structures to existing innovations systems, and create a link between local and global knowledge flows.

Berlin's economy comprises the largest rate of self-employed people within Germany (13,8 %; SenWTF, 2012, 13). The city's image as a start-up metropolis has already been mentioned. Interestingly, 53% of those start-ups in Berlin, which were enabled through venture capital, received it from foreign capital providers (Bundesverband Deutsche Startups/Hochschule für Wirtschaft und Recht Berlin, 2013, 5). This number can be seen as an indication of the increasingly international orientation of economic activities in Berlin. Moreover, it sheds light on the interplay between local knowledge practices and non-local resources. In this context, labs can be regarded nodes that organize such temporary knowledge (and partly also capital) flows.

Labs must neither necessarily be the place where an innovative or creative idea is generated nor where it is exploited as a product or a service. According to our findings, labs can potentially serve as a *station* within an innovation process: they can become, for instance, a place where the idea is temporarily driven forward. From a regional perspective, this is a double-edged sword: on the one hand, regions may feel the threat of an *idea-drain* when ideas leave the lab (and with it the region) at a certain stage of its evolution. On the other hand, labs may also function as temporary crystallization points of ideas and knowledge practices that were originally developed elsewhere. From the latter view, labs hold the power to attract people, communities, and their ideas, even if they are not embedded in or institutionally affiliated with the region at all. Labs can therefore function as temporary stations that

have to be left at a point when an idea has reached a new stage and demands highly specialized knowledge or equipment, which cannot be provided within the lab. In these cases, labs can also become information points that act as brokers for specialized entities within their region.

Furthermore, local labs are often connected with similar environments in other countries. They at times even establish further local branches. For instance, the Berlin-based “betahaus”, which is originally from Berlin, has already opened up workplaces in Hamburg, Sofia, and Barcelona⁴. As a consequence, new working places with significant similarities emerge across different regions. These are defined, on the one hand, by a similar repertoire of technical infrastructure and are further linked, on the other hand, by a common pool of norms, rules, and values (see, for instance, the international *Fab Lab Charta* or *Coworking values*). These findings show that labs generally hold the potential to connect community activities across different localities and, in doing so, connect different regions.

5 Conclusions

In this paper, we addressed innovation and creativity labs, which currently emerge as spatial and organizational units and which further occur mainly in large cities worldwide. We described them as new material and social structures for organizing work, innovation, and creativity-driven activities in knowledge based economies and discussed them against the background of an increasing demand of “out of the box thinking”. Since most labs are open to diverse user groups, they can be regarded new organizational settings for ‘communities’. Such communities can be described as heterogeneous in terms of, for instance, their members’ professions and organizational backgrounds, particularly because diverse occupational groups (freelancers, entrepreneurs, start-up teams, students, enthusiasts, etc.) are active within these spatial settings. Instead of being linked in this more traditional way, the communities that engage in and utilize labs are predominantly focused on their shared interest in creating a specific object or in investigating a new creative or occupational practice. Thus, the idea of temporary open work spaces is as promising for firms and organizations pursuing an open innovation strategy as it is for individuals and groups working in increasingly volatile economic environments.

We contextualized the concept of labs by identifying both societal motifs (such as regaining control over production processes and technologies, transdisciplinarity, empowerment) and more strategic motivations (flexibility, networking, cost reduction) framing the idea. We further embedded the concepts of various types of labs within a ‘social movement’ that illustrates – alongside similarly emerging structures such as coworking spaces, crowd funding, or share economies – the shifting character of both professional and private lifestyles and the change in working conditions within knowledge driven economies that accompanies this trend. Our case study region Berlin exemplifies the variety of labs ranging from “experimen-

⁴ <http://www.betahaus.com/berlin/> (accessed: 05.12.2014)

tation labs” to “open innovation labs” to “investor-driven labs”, each of which initiated different objectives, organizational structures, and capital endowments.

Due to its explorative approach, which was employed to better grasp the range of this new spatial phenomenon, this paper raises new research questions. First of all, the effectiveness of labs in facilitating interdisciplinary collaboration and the generation of innovation in labs is so far not been sufficiently studied. New ideas are doubtlessly brought forward in labs and innovation is indeed generated, but the scale of these activities and its embeddedness in innovation and creativity-driven ecosystems has not yet been researched exhaustively. Moreover, it is questionable whether labs in fact reach a more diverse group of users. Due to the clear focus on technology, innovation, and science, lab users do not represent the societal average in terms of gender or professions.

From a spatial perspective, labs can on the one hand be understood as spatial imprints of the relation between creating knowledge (and innovation as a potential outcome of this process) and space. Processes that create knowledge often take place within global knowledge communities, which may temporarily ‘crystallize’ in particular localities (e.g. labs) that have to be left at a different stage. Labs therefore challenge geographical perspectives on cities and regions as “islands of innovation” (Amin and Cohendet, 2004, 87) by shifting the focus from regional embeddedness to inter-regional connectivity and knowledge flows. In this sense, labs can be regarded *local anchors* for non-local knowledge communities.

On the other hand, our empirical study in Berlin shows a great variety of innovations and creativity labs, and each group shows specific location patterns. While academic-driven labs emerge mainly in spatial proximity to their host organizations (such as universities or research facilities) and are thus mostly likely to be found in university districts, firm-driven and investor-driven labs are often located in prestigious central districts. Experimentation labs face the greatest challenges since they, on the one hand, depend on central locations but their low capital endowment makes them on the other hand most vulnerable to rising rent prices.

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- SenWTF und Landesinitiative Projekt Zukunft (2014): Labs als neue Treiber von Innovation. Dokumentation der TED Tour Berlin „Labs as Interfaces for Innovation and Creativity“ und Ableitung von Handlungsempfehlungen (Bearbeiter: Dr. S. Schmidt, V. Brinks, Dr. K. Böhm). Berlin, Senatsverwaltung für Wirtschaft, Technologie und Forschung, Landesinitia-

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