The role of the innovation catalyst in social innovation - an Italian case study

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Abstract

***Purpose of the paper**: Social innovation is emerging as a dominant discourse, especially in facing the issues posed by the current crisis. Due to its close link with the local area in which it takes place, social innovation is deeply rooted in the overall system, thus involving many different actors. These parties should work synergistically to support social innovation and this requires a connecting intermediary: the innovation catalyst. However, in spite of the existence of this kind of actor its role still hasn't been formally included among the existing models of social innovation. To fill this gap, our work has been carried out by focusing on TrentoRise, an Italian innovation catalyst. Its aim is to understand the role that an innovation catalyst covers and its key features.*

***Methodology**: A single case study analysis has been developed to apply a fresh and innovative framework, the Social Innovation Pyramid, to the case of Trentino ecosystem.*

***Findings**: The analysis shows that an innovation catalyst is fundamental in developing a healthy and functioning innovation ecosystem; therefore, it should be included among the existing innovation models.*

***Research limitation**: The research has focused on a single case study. Widening the sample may be an interesting avenue for further research.*

***Implication**: The proposed model can be replicated in other areas and adapted to the characteristics of their districts.*

***Originality of the paper**: Traditional innovation models do not include the figure of the innovation catalyst, which is the focal point of our work.*

Key words: innovation catalyst; social innovation; ecosystem; Trentino; Triple Helix; social innovation pyramid

1. Introduction

One of the pressing needs of our society is the increasing urge to enhance innovation, especially due to the unprecedented and unexpected social crisis we are facing. Enhancing innovation means developing a network of public and private institutions within which the production, diffusion and application of new knowledge and technology takes place (Erikson *et al.*, 2002; Vrontis and Thrassou, 2013). In this context, the concept of social innovation is becoming more and more prominent; in particular, it is a form of innovation that explicitly aims for the social and public good (Harris and Albury, 2009). As defined by OECD (2010), social innovation seeks new answers to social problems through new services, new labor market

integration processes, new competencies, new jobs and new forms of participation. In the case of economic innovation, the biggest difference is that instead of introducing new types of production or exploiting new markets, social innovation aims at satisfying new needs that are not provided for by the market or creating innovative ways to include people in the workforce, giving them a place and a role in the production process.

Several models have been developed to enhance innovation. One of the most cited is the Triple Helix Model (Etzkowitz and Leydesdorff, 2000), which considers the dynamic interplay of firms, universities and the public actor. This model has been improved by Carayannis and Campbell (2009; 2010), who moved towards a Quadruple Helix Model and then a Quintuple Helix Model to better capture all the roles involved in an innovation ecosystem. The concept of innovation ecosystem refers to the set of people, institutions, policies, and resources that promote the translation of new ideas into products and processes (Freeman, 1988; Nelson, 2002; Foray 2009). Several elements are indeed involved in generating innovations, making the overall ecosystem quite complex (Milbergs, 2005; Maggioni and Del Giudice, 2006).

The aforementioned models are thus highly useful in capturing the complex interplay of involved roles within an innovation ecosystem. However, according to the literature on the topic of social innovation and the analysis of these existent models, the lack of an actor that could play as intermediary among all the involved actors, as a sort of innovation catalyst. None of these models actually foresee an actor that plays the role of a pivot in guiding the action of all other actors. This gap is the starting point of the present work, aimed at investigating the usefulness of developing a new model in which the central role is covered by the innovation catalyst, a specific actor that could foster the enhancement of social innovation. This kind of actor, in fact, becomes fundamental because the direct and indirect actors of innovation are very different from one another and this diversity could prevent them from collaborating with ease. Thus, the need for intermediaries that can create the necessary link among the involved actors is widely felt. In fact, there is a notable absence of intermediaries capable of connecting demand and supply and finding the right organizational forms to put innovation into practice (NESTA, 2007; Westley and Antadze, 2010). As it plays the unique role of combining actors' objectives, facilitating interaction and collaboration among them and protecting, at the same time, the entire ecosystem, the innovation catalyst can meet this need.

In this sense, the aim of this paper is to understand the role that an innovation catalyst covers and its key features. More specifically, the paper investigates the following research questions: how may the innovation catalyst foster social innovation in an innovation ecosystem (RQ 1)? how should the innovation catalyst operate (RQ 2)?

To answer these research questions, the paper focuses on Trento Rise, one of the most important examples of innovation catalysts in Italy. TrentoRise is based in the Trentino Region, an area that has become one of the best examples of virtuous and innovative ecosystem in recent years, as well as a centre of excellence in Italy and Europe, particularly in

ICT technologies. Trento Rise is a public organization owned by the largest research institution in Trento - the "Fondazione Bruno Kessler" - and by the Department of Information Engineering and Computer Science (DISI) of the University of Trento.

Thus, this paper enriches the stream of literature on innovation models and the ecosystem, on social innovation and, at the same time on intermediaries in the innovation process. The new actor we propose is capable of promoting and fostering social innovation in a innovation ecosystem, stimulating close cooperation and synergy among all its actors. This is the main contribution of the paper because there are many practical examples in the world, but very few studies that analyze them or provide an overview of these topics in order to highlight the role covered by the innovation catalyst and the key features that it should have.

The remainder of the paper is organized as follows: in the next two sections a theoretical overview of the academic literature on social innovation is outlined, along with a description of the models that have been developed to analyze the phenomenon. Afterwards, the results of the analysis are presented, underlining the main features of a successful innovation catalyst. Finally, our findings are discussed and conclusions, implications and future research avenues are proposed.

2. Social innovation

Among the first definitions of social innovation, the one coined in 2000 by the Local Economic and Employment Development Committee (LEED) of the OECD in the framework of its Forum on Social Innovation (FSI) is noteworthy. This was a multi-stakeholder forum, created with the main objective of facilitating international dissemination and transferring the best policies and practices in social innovation. The definition they came up with focused on the concepts of change, organizational change and changes in financing, and relationships with stakeholders and territories. Basically, social innovation aims at finding new answers to social problems. This can most often happen in two ways: by identifying and delivering new services that improve the quality of life of individuals and communities and by identifying and implementing new labor market integration processes, new competencies, new jobs, and new forms of participation, to contribute to the improvement of the position of individuals in the workforce (OECD, 2010).

The need for social innovation arises from many social challenges that are resistant to conventional approaches for their resolution. Social innovation means new responses to those needs and challenges, not only with its outcomes, but also with the processes it implements.

In the OECD definition a strong link between social innovation and local development is highlighted. Social innovation is a way to improve individual and community welfare, and explicit reference is made to new relationships with territories.

Social innovation aims at modifying the overall system in which social entrepreneurship can take form, creating the right framework and the strategy in which it can develop and operate (Phills *et al.*, 2008).

The differences between business innovation and social innovation have been investigated in depth (Mulgan, 2006; Pol and Ville, 2009; OECD, 2010). The main difference lies in the fact that business innovation aims at introducing new types of production or exploiting new markets in themselves, while social innovation is completely driven by the goals of public good. However, it must be noted that this view is not shared by all scholars (Pol and Ville, 2009).

Somehow it could be argued that business innovations also generate benefits not only to the innovator, but also to other parties, such as consumers and competitors, through a process that they called innovation spillover. From this perspective, the concept of social innovation adds nothing to what we already know about innovation in itself and is too vague to ever be useful.

Nevertheless, the key aspect is the way in which social innovations benefit human beings. The implied idea within this concept is that social innovation has the potential to improve either quality or quantity of life (Pol and Ville, 2009).

Interesting examples of social innovations can be found both in public and private sectors, as well as in the household and grant economies (Murray *et al.*, 2010). Examples from the public sector are projects such as the GOVJAM initiative, where both public and private employees meet for 48 hours to build and design projects that can be useful to the community, and share them on web portals. This is an example of open forms of consultation and participation that are good ways to solicit citizens' ideas and opinion. In the private sector, the creation of social businesses is a powerful way to promote social innovation.

Among the main examples, the Shokti Doi yogurt, from the joint venture between Danone and Grameen Bank, is a product developed especially for children in Bangladesh, as its composition has been studied to meet their specific nutritional deficiencies. Examples from the household economy consist in those forms of mutual action among individuals. This often happens through customer-managed tools, such as platforms for group purchasing or co-produced services like NeturalFamily, a web community that was created to help mothers re-entering the job market. Finally, the grant economy can be an important source of social innovation and in fact this is usually its most common site. In this context, social innovation can be supported through donor platforms or mission-related investments, but also by promoting training and formation, like in the Think for Social initiative, promoted by the "Fondazione Vodafone Italia" to find and support social innovation projects where new technologies are exploited to meet emerging social needs.

3. How to foster social innovation in an innovation ecosystem

Innovation is really difficult to grasp and appreciate in its complexity and it is unpredictable because it is linked to creativity (Bresciani, 2010; Bresciani *et al.*, 2013). Being innovative means having the ability

to analyze the shortcomings of the present, but above all, to imagine the challenges of the future (Heunks, 1998; Bresciani and Ferraris, 2012). Moreover, an innovation process cannot be engineered, designed from the top or a drawing board, but it is only possible to increase the probability that the innovation takes place (Chesbrough, 2003; Vrontis *et al.*, 2012). This probability tends to increase in societies where there is a greater inclination towards innovation (Krause, 2004). If an innovation cannot be engineered, it is fundamental to implement an innovation ecosystem that makes it permanent, stable and self-generating in order to increase the likelihood that it emerges (Adner and Kapoor, 2010; Ferraris and Santoro, 2014).

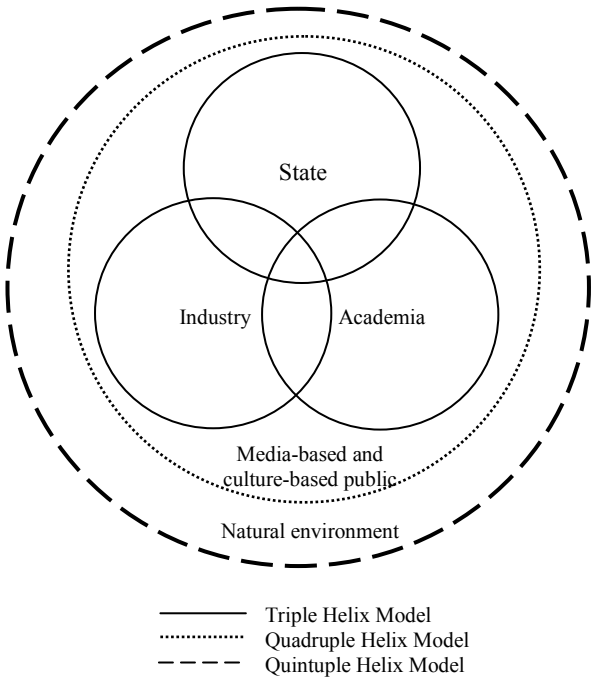
Within this ecosystem, several actors are involved in social innovation processes, and many studies are aimed at analyzing their roles. In their contribution on scaling-up processes, Westley and Antadze (2010) identified the dynamics that affect the relationship between the supply and demand for social innovation, underlining the role played by the different actors. First, they mention the vulnerable group, or the intractable social issue, that demands social innovation for its breakthrough. In response to this demand, socio-entrepreneurial organizations strive to attenuate their needs.

On the other hand, this supply cannot be financed by the users themselves, but a source of financing is needed and can come from governments, charitable foundation, or both. The success of grant proposals depends not only on the evident needs of the vulnerable client group, but also on the skills of the grant writers in mediating such needs so as to fit in with the priorities of government programs. These priorities are highly affected by news media or research units that set the agenda for the government with regard to a particular vulnerable group or issue. This underlines how social innovation requires a variety of actors working in concert or separately.

Thus, innovation processes are interactive. They can be better studied intellectually by specifying the actors and their links (Cooke *et al.*, 1997). This study may be performed by using the models that have been developed to explain how innovation emerges from the interaction of different parties. In this sense, the Triple Helix Model, as developed and described by Etzkowitz and Leydesdorff (2000), is an important landmark within this field of study. It has been advocated as a useful method for fostering entrepreneurship and growth by analyzing the existing dynamics between three helices: state, academia, and industry.

In a knowledge society, the Triple Helix thesis is that the potential for innovation and economic development lies in a more prominent role of the university and in the hybridization of elements from universities, industries and the government to generate new institutional and social formats for the production, transfer and application of knowledge (Ranga and Etzkowitz, 2013). As the authors stated, the relationship between the three actors span networks that enable and constrain fluxes of communication. Within this model, all actors should have the same weight in the relations system, as together they generate a knowledge infrastructure in terms of overlapping institutional spheres, with each taking the role of the other and with hybrid organizations emerging at the interfaces (Etzkowitz and Leydesdorff, 2000).

Fig. 1: The evolution of helices models



Source: adapted from Carayannis and Campbell (2010)

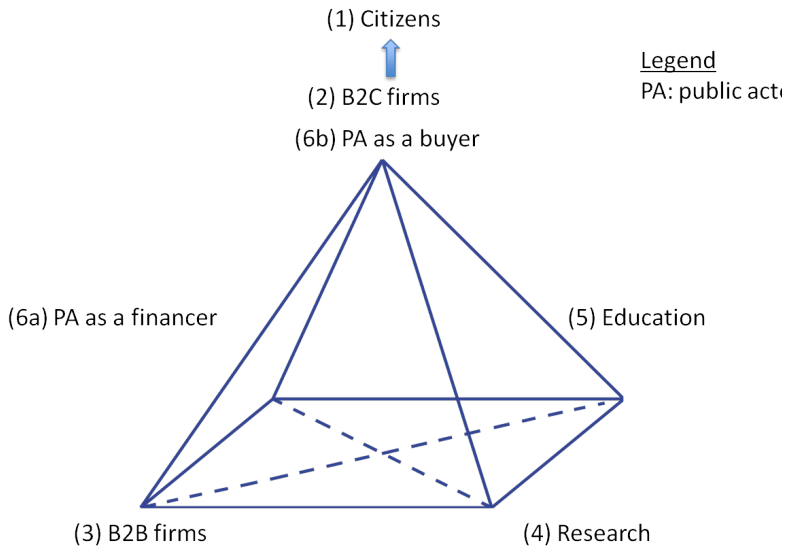
The Triple Helix model has been widened, with the addition of elements that were supposed to better complete the framework from which innovation can emerge. To this end, Carayannis and Campbell (2009) added the element of the public as a fourth helix, and more precisely identified as the "media-based and culture-based public". The authors justify the introduction of this helix by explaining how both culture and values and the way in which reality is constructed and communicated by the media highly influence every national innovation system. Public discourses are transported through and interpreted by the media and are crucial for a society to assign top priorities to innovation and knowledge (see Figure 1).

Afterwards, the same authors kept enriching the model by adding a fifth helix that links to the established model, i.e. the role of the "natural environment or natural environments of society" (Carayannis and Campbell, 2010). With this configuration, the renewed Quintuple Helix model becomes an analytical framework for sustainable development and social ecology and outlines what sustainable development might mean and imply for eco-innovation and eco-entrepreneurship in the current scenario.

Apart from the academic literature, a new managerial model has been proposed by Giunchiglia (2013). He moved a step away from the helices structure, proposing an innovative framework to analyze the involved

actors under a pyramidal perspective that better suits the peculiarities of social innovation. In the Social Innovation Pyramid, actors are distributed among the top and the bottom (see Figure 2). At the top, the first actor is the citizen, or the entire society in a wider perspective, with the final purpose of improving his or her quality of life. At the top of the pyramid an important role is also played by firms that bring about an innovation of services and products in a B2C business model, and by the Public Administration (PA) as buyer and main user of new products or services, making the creation, bootstrap and evolution easier. This also facilitates environmental sustainability in a long time perspective because of its being the main user and creator, thus laying the foundation for the future increase of private participation.

Fig. 2: The Social Innovation Pyramid



Source: adapted from Giunchiglia (2013)

Other actors are involved at the bottom of the pyramid: a) firms which provide technological innovation, either as services or products, to other firms in a B2B business model; b) the research system that provides know-how and skills to those firms; c) training and high training systems, which provide new personnel and transfer knowledge on a large scale, either to firms or to the research system and; d) the public actor who plays the role of a financer. These are the direct stakeholders of innovation, while the indirect ones are the political and the social parties systems and private lenders, including venture capitalists.

Giunchiglia (2013) highlights that the direct and indirect stakeholders of innovation are not sufficient to create an innovation ecosystem because of their diversity, which prevents them from collaborating with ease, in

particular under three important dimensions: roles and responsibilities, objectives, and time.

Concerning the first dimension, research produces new knowledge and new researchers while training institutions must transfer skills; service companies (such as those that provide energy, mobility, connectivity) and the public actor provide services, while companies provide new technology systems. As for the second, researchers have the objective of expanding human knowledge, educators that of training students to quality, companies that of generating profit, and the public actor that of providing the best services at the lowest possible cost. Finally, regarding the third dimension, it is clear that three years in research is a short period (just enough to build a new skill), for one year of training is often the minimum unit necessary to measure results, while for companies the basic unit of time is a month because they have to pay monthly salaries. This diversity of roles, responsibilities and time frames makes collaboration among the actors of the innovation ecosystem more difficult.

This overview underlined the wide range of actors that social innovation requires. What emerges, however, is a lack of an intermediary that could in some way act as a link between the various actors involved. In this sense, social innovation can be seen as the result of a combination of "bees" and "trees" (NESTA, 2007). The former are small organizations, individuals and groups who have new ideas, while the latter are large organizations such as governments or big companies which are generally poor at creativity but good in implementation and have the resilience, roots and scale to make things happen.

The problem in this picture is how to connect the bees and trees. This need is also highlighted by the OECD (2010) that, in developing policy recommendations, express their need for intermediaries, as their absence in the social field is seen as a key reason why too few innovations succeed.

The solution is the creation of a convergent interaction among the actors, aimed at producing concrete results, safeguarding both the specificity of each component and the diversity inherent in the ecosystem. What is needed, in other words, is a component that promotes and accelerates the process of creating innovation, and this the premise from which the innovation catalyst can arise.

Even if the literature review highlights the need for this kind of actor, the analysis of the existing models shows that an innovation catalyst has not been foreseen by any of them. Nevertheless, our study on the Trentino innovation ecosystem led us to conclude that in some cases, the innovation catalyst actually plays a pivotal role in fostering the enhancement of social innovation.

Thus, in this paper, we highlight the importance and the relevance of this missing actor and the key features that it should have in order to fully satisfy its role of fostering social innovation within the ecosystem.

4. Methodology

This paper comes from an extensive study on the Trentino's innovation ecosystem which was sponsored by the University of Trento. Subsequently, the analyzed data are used to explore two research questions, "how the innovation catalyst can foster social innovation in an innovation ecosystem (RQ 1)" and "how the innovation catalyst should operate (RQ 2)".

The case study is an effective illustration of one organization's approach to multi-actors management in an innovation ecosystem, in order to foster social innovation. The case study (Yin, 2003; Eisenhardt, 1989) is not meant to be generalizable, but rather is utilized here to inform about the theoretical development of the roles, tasks and benefits of a catalyst within an innovation ecosystem. The case site was chosen as an exemplar case to explore how this particular intermediate helps manage the relationships between different actors with the final aim to foster innovation.

The case study approach is useful in such exploratory modes of research and can provide detailed understanding of particular situations which may be useful to improve theory, in this case how an innovation catalyst can foster social innovation. Moreover, a case study analysis is appropriate when inquiring into a 'how' or 'why' question about a contemporary set of events, over which the investigator has little or no control (Johnson, 2008). In this case an explorative approach has been adopted, and the study has been based on the single-case (holistic) model (Yin, 2003).

The data used in the case study of TrentoRise have been collected through detailed interviews with actors from the Trentino ecosystems: 22 interviews lasting an average of 2 hours were conducted. The in-depth interview was identified as the most appropriate method to meet the aims and objectives of the research. However, primary and secondary sourced documents were also analyzed. The decision was to interview people who: a) cover key positions within Trento Rise; b) have decision making power within Trentino's main stakeholders (such as universities, research centers and public government departments). These people were chosen in order to give a more fine-grained picture of the whole ecosystems' functioning, of the complex interaction between all the stakeholders and of the role of TrentoRise.

TrentoRise is the innovation catalyst of the Trentino ecosystem. It is a fully operational institution merging the ICT branch of the largest research institution in Trento - the "Fondazione Bruno Kessler" - with the Department of Information Engineering and Computer Science (DISI) of the University of Trento, in a wide spectrum of scientific areas and human sciences. Its main goal is to combine all the actors' objectives, facilitate their interaction and collaboration and protect the entire ecosystem. To do that, it develops relationships with the local territory but also at a European level. In fact, it is a core partner of the European Institute of Technology (EIT) ICT Labs (the European answer to MIT) and part of EIT ICT Labs Italy. This entails great advantages in terms of support, prestige, research project coordination and networking.

TrentoRise therefore provides an effective and almost ideal instrument to support the integration of education, research and business dimensions;

in fact, its mission is to "act as an intermediary between research, education and business actively fostering social innovation through ICT". TrentoRise aims at promoting research to drive the internationalization and innovation of the territory and at becoming one of the leading hubs in ICT sector in Europe. Its activities are developed to: a) promote business development through innovation projects that meet societal needs; b) promote scientific research that creates added value for people, the market and the society at large; c) promote new business creation, fostering highly innovative startups in the ICT sector and d) attract highly motivated students by launching initiatives in the field of higher education that offer not only academic but also entrepreneurial education.

5. The innovation catalyst: the case of TrentoRise

In this section we propose an in depth investigation of the case study (TrentoRise), developed using the information collected through interviews and documents, to highlight the tools and the activities that were implemented to promote social innovation within the innovation ecosystem, and the main flagship projects carried out by the catalyst.

In the Italian context an excellent example of innovative ecosystem has been developed in the Trentino Region, an area that has recently become one of the most important and virtuous centres of excellence in Italy and Europe, in particular in the field of ICT technologies. Trentino is, with South Tyrol, one of the two provinces of the Trentino-Alto Adige/ Südtirol region, designated as an autonomous region under the Italian Constitution.

Within this ecosystem, the involved actors are: the University of Trento (in particular the ICT Branch), the "Bruno Kessler" and the "Edmund Mach" foundations (public research centers), the private research centers of Telecom and Microsoft, the Public Administration of Trentino (PAT), indigenous firms and citizens. TrentoRise uses different tools to promote social innovation within the ecosystem, such as the Pre-commercial procurement (PCP) and "Trentino as a Lab" (TasLab). It also proposes several activities and, at the same time, it coordinates several projects throughout the territory. This highlights how TrentoRise is actively involved in all the projects and initiatives in the Trentino Region.

In particular, the main instrument used by TrentoRise in order to foster innovation is the PCP. PCP is a process empowering public authorities to buy the technologically innovative solutions that fit their needs. Public procurers act as first buyers who share the benefits and risks of overseeing technology from its early stage research to pre-commercial products with suppliers. It focuses on domains where no commercial solutions exist on the market yet. PCP is, in essence, a mutual learning process for procurers, users and suppliers to obtain firm confirmation about both functional needs on the demand side and the capabilities and limitations of new technological developments on the supply side, when it comes to tackling a concrete public sector problem (European Commission, 2008).

First-buyer involvement in the early phases of industry R&D delivers better products at lower costs. Moreover, PCP dramatically reduces the risks and the cost of failure at a deployment stage for both procurers and suppliers. Putting several suppliers in competition to develop solutions at the pre-commercial stage ensures healthy competition and contributes to ultimately getting the best product at a favorable price. PCP can also attract venture capitalists who are looking for promising opportunities offered by the SMEs involved in such projects. In addition, PCP shortens the time-to-market by better aligning product development with customer needs, and it enables the creation of long-lasting growth and jobs and new sectors of industrial leadership through the planned innovation of public services.

Another tool that TrentoRise uses to foster social innovation is "Trentino as a Lab" (TasLab), which enables the area to test solutions before going to market and produce advantages both for the company and the territory. Users are able to participate in user-experience research activities as well as participatory design activities. Citizens' participation in the "laboratory" is gamified in order to ensure long term commitment, community building, and trust among the members of the community. This is also useful for attracting enterprises in co-location centers in order to develop R&D programs and create synergy with research and education areas but also in discovering co-financing and IPR Sharing.

Moreover, TrentoRise promotes several other activities for the growth of the collective consciousness in society, such as: a) ICT Days: an annual event for the sharing and development of awareness among the population and the major stakeholders of innovation, about (the process of) social change and its proactive management; b) Territorial Seminars: decentralized intermediate events for the growth of awareness among the population, about (the process of) social change and its proactive management; c) Social Innovation Laboratories (SIL): work roundtables with the main stakeholder groups for the proactive management of social change; d) TEDx: an international event of global significance for raising awareness about the most innovative ideas developed on a national and international reference topic "quality of life" and "'social innovation".

Finally, three main flagship projects are currently active in Trentino thanks to the TrentoRise coordination: Open Data Project in Trentino, Big Data Project and Smart Campus. These projects have been carried out in collaboration with public and private partners to make Trentino an intelligent and competitive territory with high potential and an excellent quality of life.

As concerns the first project, the Autonomous Province of Trento, TrentoRise and other business actors (Informatica Trentina S.p.a., SpazioDati S.r.l.) and research institutions (Università di Trento and Fondazione Bruno Kessler) endorse the "Open Data Project in Trentino". It aims at publishing data held by all the departments of the Province to generate accountability, transparency and foster economic growth, as expressed in the guidelines for the reuse of public data in official documents. At the same time, the team focused on the creation of the "Data as a Culture" project through educational actions both inside and outside the involved authorities. An example of this consists in the "School of Data" project organized by the

"Fondazione Bruno Kessler" and "Open Knowledge Foundation" with the purpose of disseminating tools and the best practices for the re-use of data.

Regarding the second project, Big Data Project aims at developing a platform for delivering advanced services to a wide range of users and applications. The platform consolidates all the knowledge that is currently produced in Trentino by public and private bodies with the purpose of promoting services, research and development, and enabling the citizens to have a better quality of life.

As far as the third project is concerned, Smart Campus aims at empowering the citizens of a smart city by giving them a more active role in designing, developing and delivering the services they want and like. Trento has thus become a true "smart city" where students, researchers, and institutions interact with each other and where Smart Campus becomes a lab and a community at the same time. The lab builds a social and technical environment for collaborative service design and personalized service delivery. The community is composed by all the students, researchers and staff who use the services and participate in their creation.

The above mentioned activities and projects are all in line with the findings of Almirall *et al.* (2014) in their study of open innovation in an innovative ecosystem and in smart cities.

6. Main findings and discussion

The process of innovation needs to be continually fed by new ideas, new knowledge and new projects, also from a sustainable perspective that aims to improve society for future generations (Bresciani, 2009; Del Giudice *et al.*, 2010; Tardivo *et al.*, 2011). In this context, the presence of an innovation catalyst that attracts each stakeholder, uniting them, leaving them unchanged, and bootstrapping new initiatives, is crucial.

The analysis of the case study shows that an innovation catalyst must be an agile structure and should not be afraid of the risk, but rather it should be guided by ideas and results-oriented. Another interesting result consists in the organizational structure and the employee of the catalyst. In fact, TrentoRise is not based on hierarchy, rather, it has a lean and simple structure and hires qualified personnel (20% of its employees have a PhD) or experienced managers in the key positions of the organization. Moreover, from the interview it clearly emerges that an innovation catalyst should have a strong link with the territory in which it operates (OECD, 2010), but at the same time it should be open to the world, because change is global. In short, an innovation catalyst must act within a glocal perspective that is the basis of the creation and functioning of ecosystems of successful innovation. Only in this way will it have the necessary flexibility to manage and anticipate this change.

Another fact that clearly emerges from our analysis is that an innovation catalyst should operate mainly, if not exclusively, through public-private partnerships. It should only work for completed projects,

and always within a guarantee of sustainability of the exploitation of the results once the project is finished.

Finally, it is crucial that the various collaborations must be enabled via incentives. As it makes no sense to impose innovation from the top, project activities aimed at increasing the probability of generating innovation cannot be imposed. Only those who see a chance to return, measured according to its own value chain in the initiative, will tend to participate. This is also the way to ensure medium to long term sustainability, even after the end of the project (Phills *et al.*, 2008).

TrentoRise is similar to other organizations in the world, such as the Defense Advanced Research Projects Agency (DARPA) in Silicon Valley and VINNOVA in Sweden. In fact, in the Silicon Valley, DARPA, despite being officially based in Arlington (Virginia), has played a crucial role in the birth and development of the region. Founded in 1958 as a response to the Soviet Sputnik, DARPA is an agency of the Department of Defense in charge of the development of new technologies for military use. The first beneficiaries of the substantial funding provided by the federal government were companies such as Fairchild, and universities like Stanford that are the backbone of the Silicon Valley. DARPA has not only acted as a lender, but also as a true innovation catalyst, working alongside largest companies such as Intel, and top universities like Berkeley, Caltech and UCLA.

VINNOVA, instead, is the Sweden agency of innovation, which aims at strengthening innovation capacity, supporting sustainable growth and benefiting society. VINNOVA invests about 2 billion SEK (200 million euro) every year, and can count on two hundred employees. It mainly promotes collaboration between businesses, universities, research centers and the public sector, encouraging greater use of research, making long-term investments and creating catalytic meeting places.

In conclusion, the people we interviewed clearly show how other similar innovation catalysts have played a fundamental role in foster innovation in other prestigious ecosystems in the world and compare the role of these organizations with the role of TrentoRise in the Trentino Region.

However, TrentoRise obviously differs from these larger catalysts, mainly because it operates in a smaller ecosystem. Here, the key fact is that every innovation catalyst must be adapted and functional to the ecosystem in which it operates.

7. Conclusions and implications

7.1 Conclusions

This paper highlights the basis for the successful implementation of social innovation in an ecosystem. In this paper we refer to social innovation and underline the fundamental role of the innovation catalyst in fostering the development of innovation ecosystems (Giunchiglia, 2013). Thus, this paper inserts itself within a literature and research gap because mainstream models of innovation such as the Triple Helix Model and its subsequent developments do not provide an innovation catalyst. Highlighting the

existence, role, activities and features of this new actor allows us to fill this gap in the literature and, at the same time, to align theory with practice.

In order to do this, we analyzed the Trentino Region, a centre of excellence in Italy and Europe, which has recently become a virtuous example of an innovation ecosystem. The wide range of the stakeholders involved in the ecosystem and their diversity suggest the need of an innovation catalyst that activates a permanent process of innovation through close cooperation and synergy among all actors. In Trentino this role is covered by TrentoRise, an example of an innovation catalyst that improves the quality of the relationships among the actors, favors innovation development and protects the entire ecosystem.

Therefore, the analysis we have carried out provides answers to our research questions. Trentino's example shows that a healthy ecosystem may be developed when all the actors' objectives are aligned and when a new actor, the innovation catalyst, plays the role of an intermediary, facilitating interaction and collaboration among the actors and ensuring that every component will maintain its specificity and autonomy.

The main instrument used by TrentoRise in order to foster innovation is the PCP. The first results in this territory have been positive. Eight PCP tenders are already in their execution phase, seven PCP tenders have been launched (some of which have an individual value of more than 4 million euro), 5 EIT ICT Lab projects are in execution and 6 Industrial research centers (as well as 9 additional start ups) are currently co-located with TrentoRise. However, through the interviews that we have carried out, it clearly emerges that an innovation catalyst is fundamental for each of the actors involved in the ecosystem, and this is also demonstrated by the fact that TrentoRise is actively involved in all the projects and initiatives in the Trentino Region.

This organization provides organizative and financial support, increases trust in the partners' cooperation, leading to lower transaction costs, and pushs innovation creation and sharing among all the members within the ecosystem (citizens included).

Trentino as a Lab (TasLab) and the other activities carried out by Trento Rise throughout the territory have drawn the attention of Italian and European governments and citizens showing that in order to foster social innovation in a contemporary society an actor that works as a catalyst/ intermediary is fundamental (NESTA, 2007; Westley and Antadze 2010). Also, the aforementioned flagship projects allow a small city like Trento to cover the first positions in the Italian Smart City ranking (Smart City Index, 2014).

Positive evidence is therefore linked with the development of the territory. Thus, Trentino has obtained numbers in relation to the EU average such as: 2.19% of GDP invested in R&D activities, 6.1 Employed in R&D every 1000 inhabitants, 1 University, 12 public Research Centers and 6 Industrial Research Centers. It is also the region with the lowest unemployment rate in Italy, 5% of the total population, 12.5% of the young people, while the average in the rest of Italy is more than 40 per cent. Furthermore, it is the first region in Italy regarding citizens' quality of life. This data shows how the region has become one of the most innovative

in Italy and a node of an important European ICT Network. Moreover, direct and indirect data have demonstrated how an innovation catalyst has a positive role in order to develop innovation within an ecosystem (RQ 1).

Also, the analyzed case allows us to outline some key features that an innovation catalyst should have: TrentoRise is not based on hierarchy, rather it has a lean and simple structure and hires qualified personnel (20% of its employees have a PhD) or experienced managers. TrentoRise has a strong connection with the local area and all local actors, but at the same time it is globally oriented, attracting firms, venture capital, business experts and qualified researchers. Also, TrentoRise mainly co-operates through public-private partnerships with territorial research centres, which are founders with small and big firms operating throughout the territory (or with those that have opened labs within TrentoRise structures) and its purpose is the innovation of local society, generating new forms of innovation obtained by increasing existing ones. Following this case study, all these features should be possessed by a successful innovation catalyst (RQ 2).

7.2 Implications

Summarizing, the main goal of TrentoRise is its contribution in identifying innovation boundaries and in maintaining the ecosystem in good health, while supporting the interaction among its single components. Thus, the district is the place that offers a solid basis for firms in order to maintain the competitive advantage achieved through innovation in time. The district also contributes to realizing positive network externality for small and medium firms (Becchetti *et al.*, 2007), training and attracting big multinational enterprises and maintaining a high level of innovation content in their offer (Bresciani and Ferraris, 2014).

This paper brings contributions both for academic and for policy makers. From the academic point of view, it enriches existing innovation models and proposes a new actor that plays a unique role within the ecosystem, thus fostering social innovation. From the policy makers' point of view, a deeper knowledge of this topic allows us to understand how to develop scalability strategies and replicate the model in other areas, helping regional policy makers develop similar models according to the districts' characteristics. In fact, our case study suggests how an innovation catalyst is important and underlines its key role in developing a healthy and functioning ecosystem for innovation.

The major limitations of this work are that the analysis has focused only on one case of innovation catalyst and that the Trentino ecosystem is smaller than others. Moreover, Trentino is a Special Administrative Region, where 90% of the taxes remain in the territory and are not redistributed on a national level. However, TrentoRise is the most important example of innovation catalyst in the Italian context so we decided to focus on it as we still are in an initial stage of our research. This offers an avenue for future research. On the one hand, the focus of the analysis could be broadened to other countries, even to investigate if country differences are evincible. On the other hand, additional investigation on this topic would allow the definition and development of a brand new model of Social Innovation that

hinges on the role of innovation catalyst. Moreover, it could be useful to compare this case study with an unsuccessful one.

References

ADNER R., KAPOOR R. (2010), "Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations", *Strategic Management Journal*, vol. 31, n. 3, pp. 306-333.

ALMIRALL E., LEE M., MAJCHRZAK A. (2014), "Open innovation requires integrated competition-community ecosystems: Lessons learned from civic open innovation", *Business Horizons*, vol. 57, n. 3, pp. 391-400.

BECCHETTI L., DE PANIZZA A., OROPALLO F. (2007), "Role of industrial district externalities in export and value-added performance: Evidence from the population of Italian firms", *Regional Studies*, vol. 41, n. 5, pp. 601-621.

BRESCIANI S. (2009), "Innovation and creativity within firms. An empirical demonstration in the Piedmont area", *International Journal of Business Innovation and Research*, vol. 3, n. 4, pp. 427-443.

BRESCIANI S. (2010), "Innovation within firms. A survey in the Piedmont area", *International Journal of Quality and Innovation*, vol. 1, n. 2, pp. 138-152.

BRESCIANI S., FERRARIS A. (2012), *Imprese multinazionali: innovazione e scelte localizzative*, Maggioli, Milano.

BRESCIANI S., FERRARIS A. (2014), "The Localization Choice of Multinational Firms' R&D Centers: A Survey in the Piedmont Area", *Journal of Promotion Management*, vol. 20, n. 4, pp. 481-499.

BRESCIANI S., THRASSOU A., VRONTIS D. (2013), "Change through innovation in family businesses: evidence from an Italian sample", *World Review of Entrepreneurship, Management and Sustainable Development*, vol. 9, n. 2, pp. 195-215.

BRUNDIN E., WIGREN C., ISAACS E., FRIEDRICH C., VISSER K. (2008), "Triple helix networks in a multicultural context: Triggers and barriers for fostering growth and sustainability", *Journal of Developmental Entrepreneurship*, vol. 13, n. 1, pp. 77-98.

CARAYANNIS E.G., CAMPBELL D.F. (2009), "Mode 3 and Quadruple Helix: toward a 21st century fractal innovation ecosystem", *International Journal of Technology Management*, vol. 46, n. 3, pp. 201-234.

CARAYANNIS E.G., CAMPBELL D.F. (2010), "Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other? A proposed framework for a trans-disciplinary analysis of sustainable development and social ecology", *International Journal of Social Ecology and Sustainable Development*, vol. 1, n.1, pp. 41-69.

CHESBROUGH H. (2003), *Open Innovation: the new imperative for creating and profiting from technology*, Harvard Business School Press, Boston, M.A.

COOKE P., GOMEZ URANGA M., ETXEBARRIA G. (1997), "Regional innovation systems: Institutional and organisational dimensions", *Research policy*, vol. 26, n. 4, pp. 475-491.

DEL GIUDICE M., DELLA PERUTA M.R., CARAYANNIS E. (2010), *Knowledge and the Family Business*, Springer, New York, ISBN 978-1-4419-7352-8.

EISENHARDT K.M. (1989), "Building theories from case study research", *Academy of Management Review*, vol. 14, n. 4, pp. 532-50.

ERIKSON R.S., MACKUEN M.B., STIMSON J.A. (2002), *The macro polity*, Cambridge University Press, Cambridge.

ETZKOWITZ H., LEYDESDORFF L. (2000), "The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations", *Research policy*, vol. 29, n. 2, pp. 109-123.

EUROPEAN COMMISSION (2008), *Strategy for ICT research and innovation unit*, Information Society and Media.

FORAY D. (2009), *The new economics of technology policy*, MA: Elgar Publishing, Northampton.

FERRARIS A., SANTORO G. (2014) "Come dovrebbero essere sviluppati i progetti di Social Innovation nelle Smart City? Un'analisi Comparativa", *Impresa Progetto - Electronic Journal of Management*, n. 4, pp. 1-15.

FREEMAN C. (1988), "Japan: A new national innovation system?", in Dosi G., Freeman C., Nelson R.R., Silverberg G., Soete L. (eds.) *Technology and economy theory*, Pinter, London.

GIUNCHIGLIA F. (2013), *Innovazione sociale - La nuova frontiera*, Department of Information Engineering and Computer Science, Trento.

HARRIS M., ALBURY D. (2009), "The Innovation Imperative: Why radical innovation is needed to reinvent public services for the recession and beyond", *Discussion paper*, The Labe, Nesta, London.

HEUNKS F.J. (1998), "Innovation, creativity and success", *Small Business Economics*, vol. 10, n. 3, pp. 263-272.

ISTAT (2013), *Rilevazione sull'innovazione delle imprese*, Istituto Nazionale di Statistica.

JOHNSON W.H. (2008), "Roles, resources and benefits of intermediate organizations supporting triple helix collaborative R&D: The case of Precarn", *Technovation*, vol. 28, n .8, pp. 495-505.

KRAUSE D.E. (2004), "Influence-based leadership as a determinant of the inclination to innovate and of innovation-related behaviors: An empirical investigation", *The Leadership Quarterly*, vol. 15, n. 1, pp. 79-102.

MAGGIONI V., DEL GIUDICE M. (2006), "Relazioni sistemiche tra imprenditorialità interna e gemmazione d'impresa: una ricerca empirica sulla natura cognitiva delle nuove imprese", *Sinergie*, n. 71, pp. 171-197.

MILBERGS E. (2005), "Innovation ecosystems and prosperity", Center for Accelerating Innovation. http://www. innovationecosystems. com.

MULGAN G. (2006), "The process of social innovation", *Innovations*, vol. 1, n. 2, pp. 145-162.

MURRAY R., CAULIER-GRICE J., MULGAN G. (2010), *The open book of social innovation*, National Endowment for Science, Technology and the Art.

NELSON R. (2002), "National Innovation Systems: A Retrospective on a Study", *Systems of Innovation: Growth, Competitiveness, and Employment*, vol. 2. Elgar Publishing: Northampton, MA.

NESTA (2007), I*nnovation in response to social challenges*, http://www.nesta.org.uk/publications/innovation-response-social-challenges.

OECD (2010), *SMEs, Entrepreneurship and Innovation*, http://www.oecd.org/document/16/0,3746,en_2649_33956792_44938128_1_1_1_1,00.html.

PHILLS J.A., DEIGLMEIER K., MILLER D.T. (2008), "Rediscovering social innovation", *Stanford Social Innovation Review*, vol. 6, n. 4, pp. 34-43.

POL E., VILLE S. (2009), "Social innovation: Buzz word or enduring term?", *The Journal of Socio-Economics*, vol. 38, n. 6, pp. 878-885.

RANGA M., ETZKOWITZ H. (2013), "Triple Helix systems: an analytical framework for innovation policy and practice in the Knowledge Society", *Industry and Higher Education*, vol. 27, n. 4, pp. 237-262.

SMART CITY INDEX (2014), *Confrontarsi per diventare Smart*, Rapporto di ricerca Between.

TARDIVO G., GOLINELLI G.M., BACCARANI C. (2011), "L'impresa e la conoscenza", *Sinergie*, n. 76, pp. XI-XIV.

VRONTIS D., THRASSOU A., CHEBBI H., YAHIAOUI D. (2012), "Transcending innovativeness towards strategic reflexivity", *Qualitative Market Research: An International Journal*, vol. 15, n. 4, pp. 420-437.

VRONTIS D., THRASSOU A. (2013), *Innovative Business Practices: Prevailing a Turbulent Era*, Cambridge Scholars Publishing, Cambridge UK.

WESTLEY F., ANTADZE N. (2010), "Making a difference: Strategies for scaling social innovation for greater impact", *Innovation Journal*, vol. 15, n. 2, pp. 1-19.

YIN R. (2003), *Case study research: Design and methods*, Sage Publications, Thousand Oaks, CA.

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