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Intra and extra regional openness: The role of 'trust' builders as Open Innovation Intermediaries

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Intra and extra regional openness: The role of “trust” builders as Open Innovation Intermediaries

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1. Introduction

The aim of this paper is to illustrate the case of “Trust Builders as Open Innovation Intermediaries”, as an existing phenomenon of a territory. The activities performed by these players are expected not only to show an impact on individual competitiveness but also to have a clear influence on the competitive performance of the region (Yin, 2003; Siggelkow, 2007). However, the literature has not yet introduced evidences on this systemic behavior. This paper intends therefore to fill this gap.

The literature about Innovation Management has for long referred to Facilitators and Innovation Intermediaries as key agents in the development of innovation processes (Howells, 2006; Phan et al, 2005). However, the role played by these agents has not clearly been identified in this stream of research. On the one side, some studies identify these players as bridge builders between diverse organizations (Sapsed et al, 2007). Others have considered them as technological brokers (Hargadon Y Sutton, 1997). Some studies have analyzed the function of these intermediaries as independent third agents, which try to create synergies between the different stakeholders involved in an innovative process (Klerkx & Leeuwis, 2009), focusing mainly on consultancy and engineering firms as these intermediaries.

On the other side, the state of the art is showing an increasing interest in the study of informal communities such as Hakerspaces or Makerlabs¹ (Diani, 2000), which promote innovation and knowledge diffusion through formal and informal relationships. In this regard, Networks of Practice or Communities of Practice (NoPs or CoPs) have also been identified (Teigland, 2003; Lave y Wenger, 1991). These instruments facilitate knowledge sharing and diffusion, while they also promote learning (Brown and Duguid, 2001; Wenger, 1998; Burt, 2004; Swan et al. 2002). These networks act as auto-organized teams, which embrace the existing relationships in an economic system, beyond formal links (Brown & Duguid, 1991; Brown & Duguid, 2000:143; Lave and Wenger, 1991). Accordingly, the need to consider the role of informal ties when building economic networks is underlined. These informal networks contribute also to knowledge dissemination.

The state of the arte identifies in a recent research the term “Trust Builder” (Giaretta, 2013). Trust builders are defined as a volunteer organization that cooperates with firms, also facilitating their degree of interaction. While Giaretta (2013) focuses on the role performed by

¹ Hackerspaces or Makerlabs are places where technology and science learning takes place offside the traditional educational system or research centers, based on do-use-interact collaborative approach, to gain knowledge, through informal relationships (Farr, 2009; Raison, 2010).

retired business managers, this paper characterizes trust builders as a network of multidisciplinary volunteer players which cooperate with the different stakeholders located in a region. This network focuses on identifying opportunities for the improvement of firms' competitiveness while promoting joint activities in order to improve the competitive situation of the territory. The rationale of a trust builders' network is therefore that the improvements in the technological, productive, market or product situation of each firm will lead to a gradual improvement of the territory. Even more, if the performed improvement-activities include several organizations of the territory, the impact for the region would be higher. Therefore, intermediaries work in order to *"enable innovation, either directly by enabling the innovativeness of one or more firms or indirectly by enhancing the innovative capacity of regions, nations, or sectors"* (Dalziel, 2010: 3-4). The paper will therefore analyze the role of "Trust Builders" as a network of intermediary players that impact on the territory, promoting initiatives that influence and aim to improve competitiveness through joint activities rather than seeking for the optimization of individual firms, which is mainly the research line analyzed in the literature.

The facilitation network style present in this research, supplements the stiles identified in the literature (Howells, 2006), which identified the intermediary role as firm's complementary organizations located in a territory with competences to: innovation management, as for example consultancy firms (Pilorget, 1993; Hargadon and Sutton, 1997), technological transference and diffusion, such as engineering firms (Seaton and Cordey-Hayes, 1993; Provan and Human, 1999), the establishment of contributor networks (Stankiewicz, 1995; Shohert and Prevezer, 1996), or service companies, advanced knowledge providers, such as Research Centers (Czarnitski and Spielkamp, 2003; Muller and Zenker, 2001), among others.

One of the characteristics of this intermediary structure is that the knowledge not only lies in the members of the innovation system, but knowledge is also a relevant ingredient for the trust builders that are active in the intermediary network. The network is formed by heterogeneous intermediaries that cooperate with the whole system, considering not only productive firms. As identified in the literature dealing with "Boundary Spanners" (Guston, 1999; Cash, 2001; Hustad & Bechina, 2012) or "Innovation Intermediaries" (Shohert & Prevezer, 1996; Seaton & Cordey-Hayes, 1993; Klerkx & Leeuwis, 2008; Dalziel, 2010; Häkanson et al. 2011), the analysis carried out in this paper around the role played by "Trust Builders" also adopts the point of view of the firm as an essential player (Buesa et al, 2002) of any economic system. However, it has to be emphasized that this firm perspective is complemented with an innovation systems view, so that the firm has an interactive behavior with other stakeholders.

The analysis is developed in the Durango County, which is located in the Basque Country (Spain). This territory keeps a very high industrialization level, and a very important level of sectorial specialization and homogenization, mainly in the automotive industry. The firms located in the area are mainly SMEs and micro SMEs.

2. State of the Art

In the literature about Territorial Innovation Models (Moulaer & Sekia, 2003), the management of innovation activities is considered a central issue (Quinn, 1985; Lundvall et al.

2009). Innovation success is related to the presence and participation of the players located in territory, and the relationships between them. These relationships include both formal and informal agreements. Often, the role and benefits of formal cooperation are underlined in the literature (Tranos, 2014; O'Donnell, 2014), but from our point of view, informal interactions should not be forgotten. Informal relations not only provide actors with an 'soft' interactive pattern, but can also lead to the further establishment of formal economic activities through such vehicles as friendship links, cultural and historical values of the economic system, participation in common associations, etc. Therefore, those informal relationships that strengthen social capital need to be taken into consideration.

From a systems perspective, the state of the art gathers a large list of terms –*Intermediaries, Bricoleurs, Brokers, Boundary Organizations, etc.*–, when referring to facilitators. Specifically, the literature about Innovation Systems (Eriksson, 2000; Watkins et al., 2014), includes the existence of players or organizations that facilitate the interaction between the actors present in a territory. These intermediary players are however not directly identified in the three subsystems recognized by Etzkowitz's triple helix (Etzkowitz, 2003). Despite the different labels used, the role played by each of these actors is very similar across different studies, as all of the previous terms are expected to intermediate between the players located near the demand and those near the supply –*technological, market, product, process or knowledge supply* (Howells, 2006; Klekx & Leeuwis, 2009).

Adopting a broader understanding of the literature dealing with the role played by facilitators, the following activities could also be considered:

- Obtain and spread key information for the economic system (Hargadon & Sutton, 1997; Wolpert, 2002)
- Try to give information about possible synergies: knowledge players, competitors or members of the same value chain (Turpin et al., 1996; Aldrich & von Glinow, 1992).
- Negotiate agreements between two or more participants, in order to establish a collaborative network (Rosenfeld, 1996).
- Act as mediator between organizations, that are, somehow, related (Luukkonen, 2005).
- Cooperate in the technical, market and financial counseling, of the innovative results resulting from collaborations (Davenport et al., 1998).

2.1. The work of intermediaries, in an “Open Innovation” paradigm

In a globalized world, innovation processes can take place in any country, concerning players that do not share any kind of relationship. Therefore, those players need to be identified and ties should be established with them. This section will provide a view on how intermediation processes are performed in an open economic system (Hossain, 2012).

Open innovation is understood (Chesbrough, 2003) as the required procedure to accede to incoming and outgoing knowledge, so as to speed innovation up and access new markets, getting approach to external new knowledge sources. Traditionally, different open innovation procedures have been studied in the field of firms and their value chains (Christensen et al, 2005; Vanhaverbeke & Cloudt, 2006). Nevertheless, territorial open innovation models that

focus on the opening of a region to access new knowledge have been also identified (Porto, 2014, Savitskaya, 2009). These open models would try to improve the competitive advantage of the territory through new knowledge sources.

Open innovation can be seen from two perspectives (Chesbrough, 2003; Huizingh, 2011). Firstly, “Inbound” or “Outside-in”: this implies putting the knowledge acquired and generated by others into practice. This first understanding of open innovation is suitable for low or medium technology industries, in which tacit knowledge is the key to share information (Gassmann & Enkel, 2004; Chesbrough & Crowther, 2006). On the other hand, the “Outbound” or “Inside out” conception of open innovation (Enkel et al., 2009) supports that the firm establishes relationships with external players to commercialize the inner developments and acquire knowledge. From both perspectives it is essential to establish ties with other players in order to access new information, turn that information into knowledge and transform it into a marketable result.

In both cases, the firm transforms its limits *“into a semi-permeable membrane enabling innovation to move easily between the external environment and the firm’s internal innovation process”* (Chiaroni, et al. 2011:2). In this way, Open Innovation implies the establishment and exploitation of a relations network with heterogeneous players that contribute to access new markets, products, processes. Those players can be universities, research centers, vocational training centers, clients, providers, firms outside the value chain, etc. (Perkmann & Walsch, 2007; Emden et al., 2006; von Hippel, 2005; Simard & West, 2006).

Establishing cooperation networks to promote innovation has been a topic under study in the literature for a long time (Callon, 1994; Lynn et al., 1996; West & Lakhani, 2008; Faraj et al., 2011). In those networks, intermediaries are supposed to promote a change in the existing relationships between inner players, stimulating more links with research and technology actors, in order to reach new knowledge sources.

Nevertheless, the methods to introduce this management paradigm are also different depending on the firm size (Lee et al, 2010; Rahman & Ramos, 2010; Bianchi et al., 2010). Specifically, the state of the art underlines that SMEs take great advantage from Open Innovation, when establishing relations with third parties (Rahman & Ramos, 2010). Open Innovation methods become essential for SMEs in the marketing process, more than in the research and development processes (Narula, 2004). In this way, the innovation interest of the SMEs is directly related to problem solving through incremental innovation projects (Kaufmann & Tödtling, 2002) bound to technologies, processes, products or markets close to the current situation and context of the firm. This management paradigm would lead SMEs to a cooperative network model (Lee et al. 2010) which would facilitate firms’ access to new knowledge sources in order to improve their competitive advantage.

“Open Innovation Intermediaries” are thus defined as intermediaries working under an open innovation paradigm, in order to reduce the distance between organizations trying to obtain competitive advantage, and those players that have useful knowledge sources to be exploited (López Vega & Vanhaverbeke, 2009; Hossain, 2012; Hallersted, 2013). No major differences are identified in the labor performed by an Innovation Intermediary or an Open Innovation Intermediary. The main difference between them is related to the relevance of trust, social

and informal relationships under an open innovation paradigm (Rass et al., 2013; Fleming & Waguespack, 2007; Adler & Kwon, 2002; Fichter, 2009).

Research has offered a broad qualitative view of how open innovation intermediaries function and has explored some aspects of their operations in matching innovation supply and demand (Lakhani et al, 2007; Boudreau et al. 2008; Jeppesen & Lakhani, 2010). However, these intermediaries have different structures due to the various underlying mechanisms that leverage participant incentives for intermediary platform members (solvers and search agents) to increase and direct their participation (Bakici, 2013).

In 2013, Giaretta proposed the term **“Trust Builders”** (Giaretta, 2013), arguing the need to strengthen formal and informal trust relationships in order to share knowledge. These “Trust Builders” would be a kind of intermediary that promote trust relationships between geographically near located players through face-to-face repeatedly interactions kept in time. “Trust Builders” are characterized by having a technical or professional reputation recognized by the stakeholders located in a territory (Dodgson, 1993).

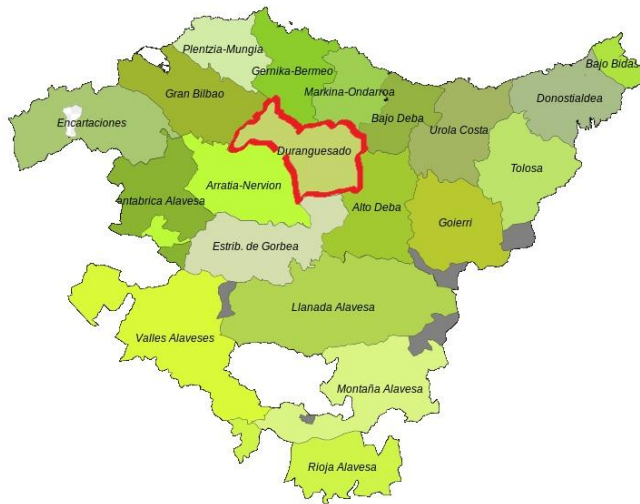
However, the case presented by Giaretta (2013) is limited to intra-firm technological transfer and intermediation, avoiding other areas of relevance for the firm, such as product diversification, process improvement, management innovation, or access to new markets. Besides, Trust Builders are restricted to retired business men, with a high firm management background, that voluntarily help other firms located in the same region (Giaretta, 2013:5). Therefore, only considering business men as intermediaries, overlooks other possible stakeholders, which are also located in the territory, such as associations, training or research centers, etc. (Comacchio et al. 2012). This is one of the contributions done by this paper, emphasizing the role of Trust Builders as a network of intermediary players that seek to have an impact on the territory as a whole rather than on the individual performance of unitary firms.

3. An open network model to promote innovation: The case of the Durango county

The case introduced below is focused a county located within the province of Biscay, which is in turn located in the Basque Country. This county is formed by 10 small towns with a low population, but with a high industrial activity.

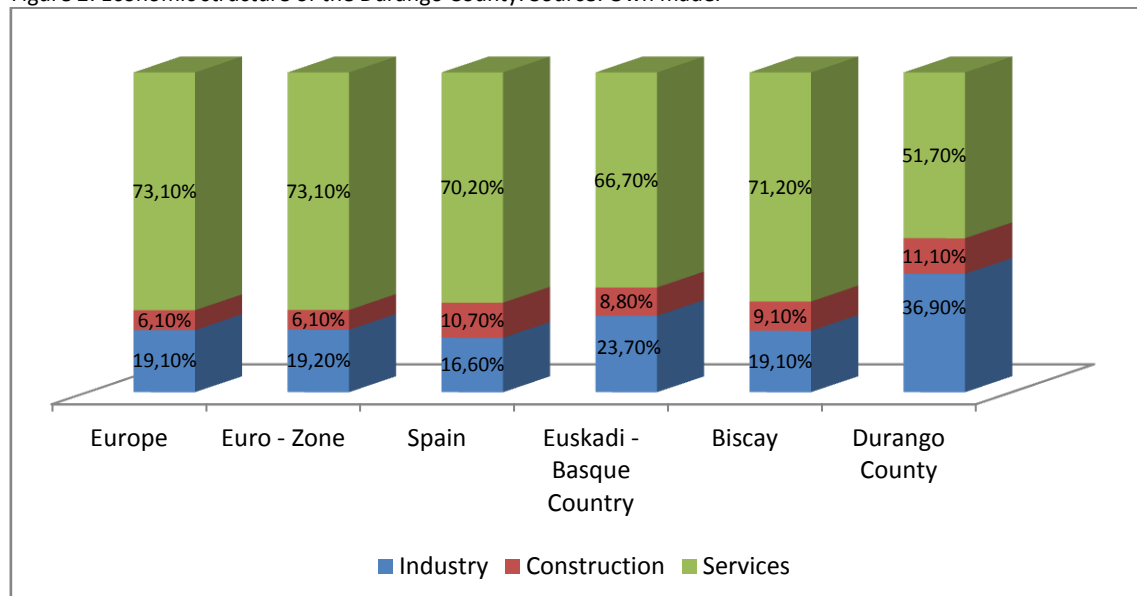
Figure 1: The situation of the Durango county. Source: Own made.

Surface	297.94 Km ²
Population	76,640 inhabitants
Density	4,324 inhabitant/km ²



The Durango County has a strategic situation within the Basque Country, as it allows interconnecting the rest of the region due to its geographical positioning. It is a united territory, geographically delimited, and with associations implied in social capital strengthening, which boost the territory. The dimension of the county, concerns to micro-territorial case, with a decentralized and multi-level policy setting. Specifically, industrial policy is undertaken at the Basque Country level, while tax policies are defined and implemented at the provincial level (Biscay). However, national and European policies also have a clear impact on the economic performance of the county.

Figure 2: Economic structure of the Durango County. Source: Own made.



a. Players inside the economic system

The county has a productive subsystem characterized by a strong knowledge in the metal transforming sector. In this regard, it counts with a large variety of players that contribute to the generation and diffusion of technical knowledge, such as de Vocational Training Centers and the Advance Knowledge Centers (e.g. Automotive Intelligence Center, AIC and AZTERLAN-IK4 Research Center). Besides, there are also socio-institutional organizations that strengthen the social capital of the territory, such as regional development agencies, associations, etc.

i. Productive or Knowledge Exploitation Subsystem:

This subsystem is formed by the firms that perform their manufacturing activity in the county, considering those that produce goods or supporting processes. The county includes key metal transforming firms, such as casting, stamping or forging, as well as supplementary industrialized companies (e.g. *thermal treatments, machining or welding*).

SMEs are the main agents involved in this subsystem, as it is also the case in the Basque Country as a whole (Mera & Jiménez, 2005). Specifically, 69% of the enterprises of the county are micro-SMEs (less than 10 workers) and the 23% are small SMEs (between 10-50 workers). According to the activities performed, the primary sector of the county (0.3%) is similar to the province of Biscay (0.6%) or to the Basque Country as a whole (0.8%). The main differences are in the dedication to industrial or services activities. 36.9% of the firms of the county are devoted to manufacturing activities, while is just the 19.1% in the case of Biscay or the 27.7% in the case of the Basque Country (See Figure 2).

Once the economic system has been characterized as predominantly industrial, we show below the activities performed by the firms of the county, considering the technologies used and the markets they operate in. We introduce the percentage of the firms devoted to those activities and the employment they create (See Table 1). We can state that the 80% of the industrial employment of the county is focused on metal transforming.

Table 1: Economic structure of the Durango county. Source: Own made from Local Development Agency Data.

Activity performed	% Firms	% Employment
Assembling	14.07%	24.02%
Stamping	14.95%	21.29%
Casting	12.75%	16.25%
Machining	23.08%	13.32%
Forging	5.71%	8.17%
Welding	10.11%	4.90%
Treatment	7.91%	3.65%
Plastics	2.42%	3.04%
Tooling	0.44%	2.89%

The enterprises inside the county mainly operate in the metal transforming value chain, with Stamping, Forging and Casting as the key transformation technologies (Canto Fresno, 2000; Trejo Téllez, 2011). The labor performed by these industries would be complemented by other manufacturing firms (i.e. mainly in the machine tool segment) that provide additional activities to the main products delivered by the sector such as machining, welding, treatment, etc. Finally, the end of the value chain would be found on those intermediary clients who would be the Assembling firms that produce an intermediary product to be received by the final or intermediary client. Besides these, other supporting agents could be found, such as TIC, Tools and Machining, Energy or Wasting firms.

The primary markets of the products, services and processes of the local firms would be the automotive industry (51% of the sales), Machine and Tooling (10%), Electrical Appliances (4%), Energy (4%), and the Paper Industry (3%), among others.

Regarding the innovative orientation of the productive subsystem, the local firms had a less innovative profile in their activities in 2011 as compared to 2008. The economic crisis could be a reason for this decrease (See Table 2).

Table 2.- Innovation Activities performed by industrial companies 2006-2012 (Millions de €). Source: Eustat (2013)

	2006	2007	2008	2009	2010	2011	2012
Spain	16,533.41	18,094.61	19,918.94	17,636.62	16,171.21	14,755.8	13,410
Basque Country	1,829.7	2,030	2,193.9	2,219.9	2,159.5	2,214	2,179.5
Biscay	791.1	899.1	962.9	1,013.20	1,025.20	1,053.30	1,008
Durango County	78.1	90.1	108.8	114.4	107.9	95.2	107.1

ii. Knowledge Generation Subsystem

Two types of knowledge centers are identified in the county. On the one hand, Vocational Training Centers train the technical workers of the county in industrial technologies, and work in technological optimization projects with local firms. These centers keep a proactive attitude, close to local firms, in order to work with them in technical projects, process optimizing, joint projects, etc. Therefore, their staff (i.e. mainly teachers) is directly involved in firms' problems solving activities. Even though they are not regarded as university professors, they work together with the technicians of the productive system.²

On the other hand, advanced knowledge centers or research centers are to be found. These centers promote technological radical or incremental innovations. One of them is oriented toward the automotive industry, aiming at promoting excellence in research in this segment (Automotive Intelligence Center, AIC).³ In turn, the second one is oriented toward the metal transforming industry (AZTERLAN-IK4). AZTERLAN is a private research center, member of the Technological Alliance IK4, and consequently, member of the Basque Research, Technology and Innovation Network. It was born from a vocational training center of the county, and has a broad experience –more than 30 years- in metal research. The researchers of the centers were at first teachers of the vocational training centers. The principal clients of the center are in automotive, energy or aeronautic market. Inside the client portfolio, the 35% of the clients are located in the county.

In addition, even though it is not located in the county, there is an active participation of the University of the Basque Country (EHU/UPV), which has a strong cooperation with the AZTERLAN research center in technical congresses or advanced academic training, so as to improve the technical skills of the workers.

iii. Socio Institutional Subsystem

In this level we find a multilevel public network: The direct participation of the local public administration and a County Development Agency, working together with supra-local entities, such as the Biscay Development Agency (BEAZ) and the Basque Country Development Agency

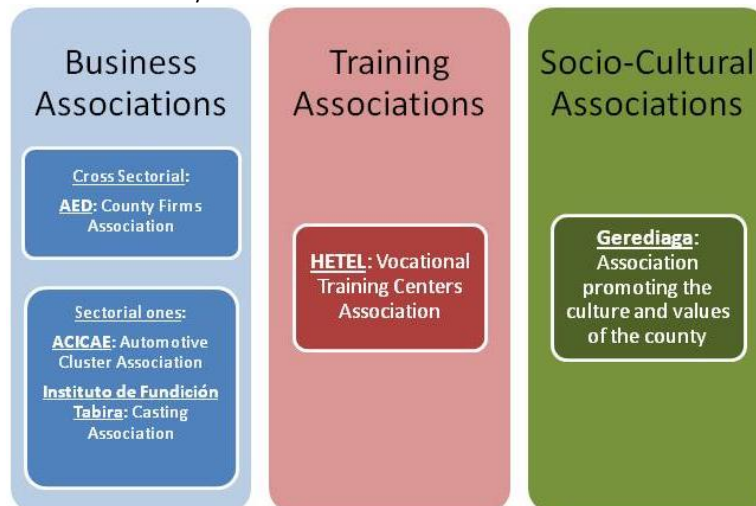
² Example of the availability is the participation of the vocational training centers as authorized agents in the Cheque +INNOVA 2012 and 2013 call, to perform firms technological improvement projects. Another example is EKOSCAN projects focused on environmental improvement of the firms as well as the county itself.

³ AIC is a unique value-generation center for the automotive sector based on a concept of open innovation in which companies improve their competitiveness through cooperation, using a market-oriented approach. 22 firms have moved their laboratories and factories to AIC, in order to get closer to the advanced knowledge generators.

(SPRI). In the three levels –local, provincial and Basque Country-, different policies are undergone affecting the region.

Besides public administrations, this subsystem also includes cross-disciplinary associations that contribute to strengthen relationships (Mohannak, 1998). They embrace for example the County Firms Associations, the ACICAE Association or Automotive Cluster Association, the Tabira Casting Institute, the Basque Vocational Training Association HETEL, etc. An important feature of this county is the existence of an inside county firm association. It is also noteworthy mentioning the existence of another organization, Gerediaga, which promotes the cultural values and historic differences of the county.

Figure 3: Associations inside the county. Source: Own made.



In this subsystem, would also appear the Intermediary Agents or Facilitators (Eriksson, 2000), which in this case would fit with the Trust Builders figure. Eriksson (2000) considers those facilitator are external participants which contribute to unite the region, as well as make easier to establish relationships with inner or outside regional players. This author considers this role is possible because of the strong social capital in the region.

4. Research design

Up to now, there are no studies that empirically analyze the role played by Open Innovation Intermediaries (Lakhani et al., 2007). This paper, as well as most of the identified studies in the state of the art, focus on the way this players work, qualitatively comparing their labor (Lichtenthaler & Ernst, 2008; Howells, 2006).

Through a case analysis, this research shows a volunteer intermediaries network, based in intra and inter regional cooperation. Following Huizingh (2011), case studies and descriptive analyses are regarded as effective methodologies to understand open innovation practices, although it is deemed also necessary to quantify the results and the facts that promote this phenomenon. For that purpose multidisciplinary players of the subsystems inside the county were interviewed:

- Productive subsystem:
 - 7 firms' director symbolizing the variety of the productive subsystem.
- Knowledge generation subsystem:
 - 3 knowledge generation players located or not in the county.
- Socio institutional subsystem:

- 3 Multilevel public administration responsible people, with political competence in the territory.
- 3 technological, market or industrial firm associations.

The above interviewees are individuals that Trust Builders work with. Therefore, to complement their opinions, 7 of the 8 Trust Builders were interviewed. This let us focus on the tasks they perform. Two of them could not be interviewed face to face, so we received the answers by email.

In summary, the interviewees were:

Trust Builders	Productive Subsystem	1- Firm Director. County. Inhabitant of the county. The firm is related with the metal value chain. More than 30 years of working experience in the metal value chain.				
	Knowledge Subsystem	Located in the county	Vocational Training Centers	2- Directors of Vocational Training Centers. They train nearly the 80% of non degree workers of the county. The work in technological projects with county firms. Inhabitants of the county.		
			AZTERLAN-IK4 Research Center	1- Technology director. Former teacher of vocational training center. Inhabitant in the county.		
		Outside the county	Basque Country University	1- University Professor. Inhabitant in the county. 30 years of working experience within the county firms.		
				1- University Professor of the Mechanic Department. 40 years of experience working with firms in technological projects. Not county inhabitant.		
Intermediated people	Productive Subsystem	7- County firms. Technologically diverse. Value chain diversity.				
	Knowledge Subsystem	Located in the county	AZTERLAN-IK4 Research Center	1- Metal Research Center Director. Former teacher of the private vocational training center. 40 years of working experience in the county.		
			Private Vocational Training Center	1- Director in charge of International Relationships.		
		Outside the county	Basque Country University	1- University Professor. Former worker of one county firm		
	Socio-institutional Subsystem	Public Administrations	Located in the county	Local Development Public Agency	1 -Director of the Agency 20 years of experience working in the county	
			Outside the county	Basque Development Public Agency SPRI	1- Director. Main public financial backer entity.	
				Science and Technology Ministry	1- Director of Spanish Administration. Past worker and contributor of county firms.	
		Business Associations, Located in the county	Tabira Casting Institute.	1- Director of Spanish Casting Association. 20 years of work experience in the county in metal firms.		
			Durango County Firms Association	1- Association Director. Inhabitant and worker in the county. Aim of the association: promote county and firms inside it competitiveness.		
			Automotive Cluster Association ACICAE	1- Technician of the association. Not inhabitant in the county.		

Table 3. Interviewed players. Source: Own made.

The interviews were open, organized in block themes about the issues to deal. Depending on the interviewee, the questions were modified so as to identify and more accurately get to know their view about the currently situation of the county, and understand the conditions of the economy and industry inside the territory. The questions tried to cover the different themes:

- Opinion about the cooperation between stakeholders inside the county.
- Attitude towards opening kept between players inside the region, and the performance of the Trust Builders, in order to strengthen that opening.
- Chances to strengthen the relations between value chain stakeholders as well as outside knowledge flows exploitation.
- If the interviewee was a Trust Builder: Opinion about the firms inside the region and their technological maturity: The work performed to improve the situation of the firms, and the opportunities they consider firms could fulfill to progress at the product, process or process level. Opinion about the cooperative projects and competition between firms.

The interviews were carried out between October 2012 and April 2013 and lasted about 2 hours. They were transcribed in order to identify similarities in the opinions of the interviewees. The interviews were complemented with direct observation of the stakeholders inside the county and their relationships with external players and historical data collection about inter firm collaboration, in order to make a first analysis of Trust Builders impact on the county. This data was obtained from Basque Government public databases, where public subsidies resolutions for R&D programs appear.

5. The role of Trust Builders as Open Innovation Intermediaries.

Below we introduce the influence that Trust Builders have on the development of the Durango County. Firstly, the section starts by offering a description about those intermediaries. Then second, we address the role played by these intermediaries and finally, discuss which their main results are to date.

a. **Who: The roles of the Trust Builders**

In this section, we aim to illustrate the configuration of the Trust Builder network, attending to the role performed by each player and their individual achievement inside the county.

Trust Builders correspond to multidisciplinary stakeholders, technically and professionally valued by all the subsystems of the county (Porto, 2013), due to their professional background and experience. These Trust Builders collaborate among themselves in order to constitute a nonprofit volunteer network. Their work starts in 2008 as a consequence of a strategic reflection performed by the Local Development Agency. As it has been stated, the main aim of these players is the improvement of the competitiveness of the county through both individual and cooperative business improvement projects.

Specifically, these players focus on technological and productive improvement of firms. As a result of the confidence in those trust builders, firms accede to make those improvement

projects. In this way, firms accede to perform an individual diagnosis situation so as to identify potential product, process, technology or market opportunities that may improve their competitiveness. The next step is the implementation of the optimization projects. Some of them can be performed jointly, considering the sectorial specialization of the county industry and the tacit metal knowledge. Therefore, some projects are proposed together with other firms. In order to establish the relationships between those firms technical sessions are scheduled, where they introduced possible joint opportunities between complementary enterprises, as well as new business chances to accede new markets or to perform new products. In case of not having in the region the technical need capacities, the Trust Builders try to promote relationships with external stakeholders, considering their market and sectorial knowledge.

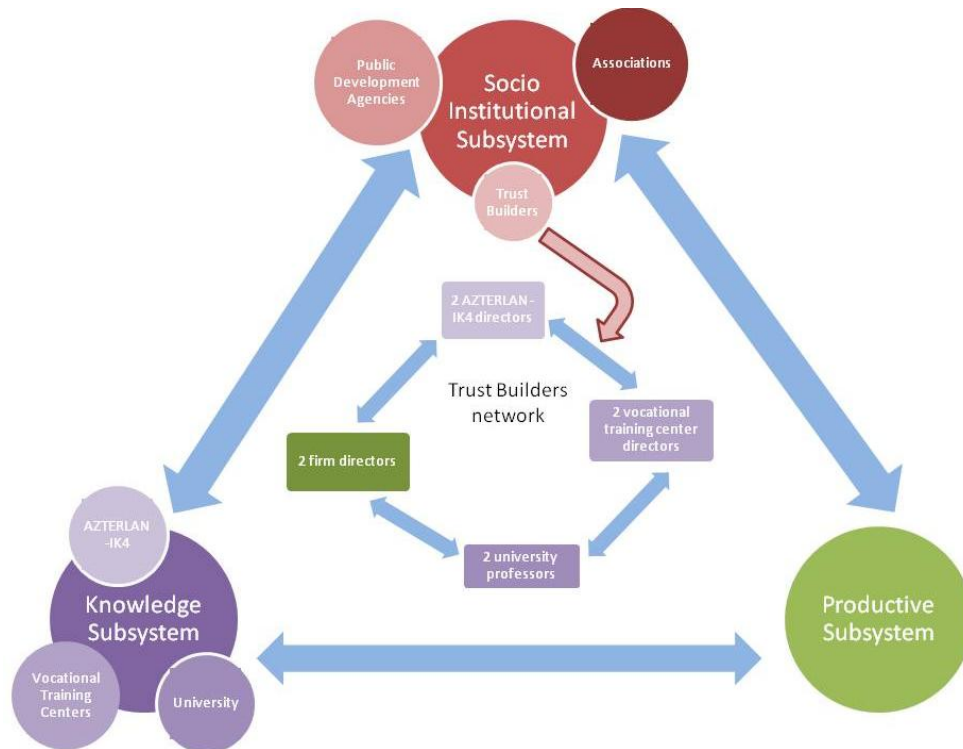
Trust Builders would therefore correspond to an intermediary network structure, where volunteer stakeholders try to unite the territory, considering the knowledge management and diffusion, so that firms identify innovation chances (López Vega & Vanhaverbeke, 2009; Hossain, 2012; Hallerstede, 2013).

The Trust Builders would match with the following profiles (See Table 3):

- **2 AZTERLAN IK4 research center directors.**
- **2 vocational training directors.**
- **2 university professors** with a huge experience in the county productive subsystem, even though the university is not located in the area.
- **2 multinational firm technology and production directors**, located in the county.

Below, we introduce the interaction diagram that illustrates the relationship between Trust Builders and the different stakeholders of the productive, institutional or knowledge subsystem. The work of the Trust Builders have focus on the productive subsystem, being the firms the key partners of any territorial innovation model. Nevertheless, the other subsystem stakeholders actively participate and cooperate in the schedule activities, so as to identify jointly work lines, based on the county diagnosis performed.

Figure 4: Interaction between Trust Builders and Subsystems located in the county. Source: Own made.



b. How: Intra and Extra Regional Open Innovation

Below, we introduce the performance of the Trust Builders, attending to the interaction with local stakeholders as well as with external ones. As it has been mentioned in the state of the art (see section 2), the role of intermediaries is not limited to the identification of alternatives. The chief actions are the interest knowledge sources detection and the establishment of relationships between inner county players and outside stakeholders, through international forums, multinational firms, etc.

For that reason, the role of Trust Builders as “Open Innovation Intermediaries” can be seen from a double perspective. On the one hand, an inner opening view resulting from the firms’ availability to be freely analyzed by external intermediaries, in order to perform the individual situation diagnosis. Another example of that inner opening would be the little but continuous advanced being made in joint projects between county firms. On the other hand, the external opening is justified by external contact sharing (e.g. *associations, clusters, universities, research centers*) These two perspectives would provide alternatives to avoid a lock in effect (Narula, 2004) as they offer a network of external stakeholders to access new information sources, inside the territory or outside it.

In order to identify the **inner opening**, besides the individual firm diagnosis, different conferences, workshops, meeting and networking events are scheduled so as to deal with the identified synergies, at the product, technology or market level. The aim of these meetings is not only to establish relationships between stakeholders, but mainly to increase the knowledge of those players, in order to improve the competitiveness of each firm. In those sessions they also introduce possible examples of joint initiatives. Nevertheless, the decisions

about whether or not to proceed with the identified improvement projects belongs to the firms. Local firms around the metal value chain are the main participants of those sessions. As they share the metal knowledge, it is easier for them to identify opportunities where they can offer complementary services in order to supply with higher value added goods.

On the other side, the intermediation in order to facilitate an outside opening is mainly due to the formal or informal relationships the Trust Builders, knowledge system players, and technical Associations keep with external stakeholders. Their technical and professional grounding afford a large contact network. The main external contacts would be:

- The participation in supra local management dynamics (e.g. AIC, Plataforma Tecnológica IK4, CIC marGUNE⁴).
- Relationships with other research centers or universities, as well as technical associations: KIMURA, World Foundry Organization, European Cast Iron Group, other Basque Country University departments, Deusto or Mondragon Universities.
- Contacts with firm groups, in case of multinational or cooperative enterprises, such as CIE Automotive, LAIP industries, TATA, ULMA, DANOBAT, or VELATIA group, among others.
- Relationships with final value chain clients, not located in the county. In the case of automotive market, would appear final car manufacturers, such as Renault, Seat, Land Rover, etc. In case of wind energy, the main client is Gamesa, Basque firm located also in the Basque Country.

In this sense, gaining the trust of a firm belonging to a business, cooperative or multinational group, would let a possible subcontractor to access the relations network of the trusting firm group. This would be possible thanks to the trust relationships between the firms (Kramer & Tyler, 1996), strengthen by the role of the Trust Builders. Therefore, by providing a better access to external actors to the firms, these intermediaries reinforce the aperture of the entire system.

c. What: The results

Although no quantitative analysis has been realized to estimate the obtained results, we introduce below some indicators that could help in evaluating the performance of these intermediaries. Though the promotion of the territorial competitiveness through these actors started in 2008, the direct work with productive firms did not start till 2009. That is why the following indicators cover the period 2009-2013:

Table 4.- Indicators of the Intermediaries performance. Source: Own made

Indicators	Value
Firms they have acceded to	250 ⁵
Number of technical conferences	30
Performed individual diagnosis	50
Competitive improvement individual projects	150 ⁶

4 CIC Margune is the Cooperative Advanced Manufacturing Research Center, opened in 2002.

5 Number of firms they have kept meetings with.

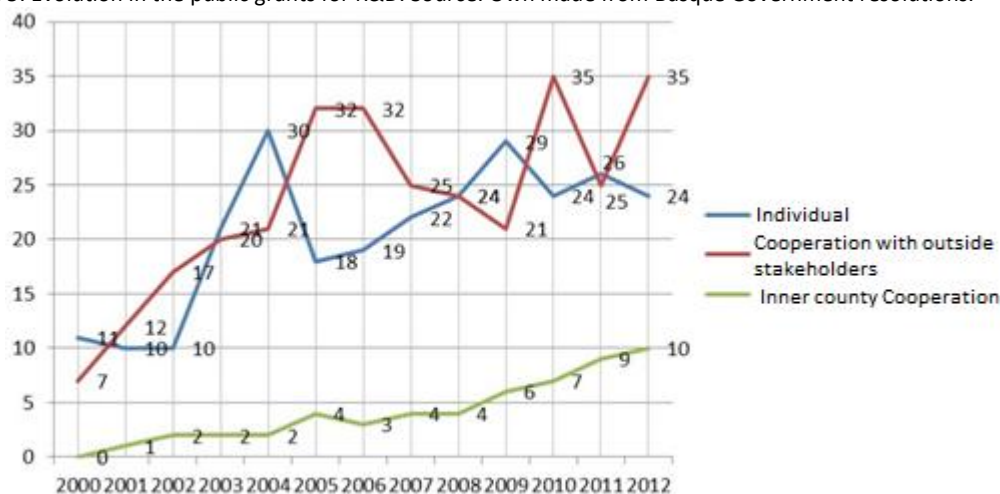
6 Estimated value according to the participation in technological innovation subsidiary programs of the Basque Country: COMPITE, calls 2010, 2011 and 2012. Cheque +INNOVA calls 2012 and 2013 and Innovation Promotion Subsidiary programs of the Biscay Government.

Cooperative projects evolution	See
Coopetitive projects underway	4
New technological firms or Start Ups	3
Market extension. Internationalization alliances.	2
New possible client markets	2

The role of Trust Builders has allowed establishing synergies between firms in the value chain or competing firms, even if this is not directly and exclusively attributable to their performance. Till 2009 no ‘coopetitive’ projects had been considered, while in this moment there are four underway. Two of them have resulted in the joint establishment of start-up firms with a new technological basis from direct competitors. The aim of those coopetitive projects is to propose alternatives for the midterm, outlining potential relationships between competitors in order to carry out initiatives far away from the marketplace (Porto, 2014).

No direct data have been obtained, to analyze the project portfolio of each firm, in order to identify the differences to work individually or cooperatively. So, in order to compare a possible evolution in executed innovation projects, we have reviewed the public grants, to identify if firms cooperate with county firms, with other firms of the Basque Country, or by themselves to achieve technological R&D projects. For that purpose, a revision is made of the R&D subsidiary opportunities of the Basque Country: INTEK program (2000-2005) and INTEKBERRI program⁷ (2006-2012). Innovation promotion subsidy programs are not considered, but could be used for other indicators^(See footnote 5). As it can be seen in the figure 5, since 2009 cooperative projects between county firms duplicate.

Figure 5: Evolution in the public grants for R&D. Source: Own made from Basque Government resolutions.



Comparing Innovation promotion subsidy programs of the Basque Government, through the Compite program in the years 2010, 2011 and 2012, the Durango County is a strategic region. It becomes the first county of the Basque Country with the largest number of cooperative projects between local firms -3, 4 and 6 respectively-. In addition, it has also a higher participation in individual projects -17% higher than other industrial counties of the Basque Country-.

⁷ The INTEK and INTEKBERRI subsidiary programs of the Basque Government promote R&D projects to promote new products or processes, individually or in collaboration with other stakeholders.

We cannot directly attribute these results to the performance of the Trust Builders, but is surprising, to find the improvement have started, as a result of the labor developed by these intermediaries.

Therefore, attending exclusively to the obtained results through territory observation, an increase in cooperative relationships and business synergies can be observed due to the performance of the Trust Builders. These actions mainly turn into process or products competitive improvements, cooperative projects, new technological base firms or internationalization alliances⁸.

6. Discussion

The aim of this paper is to validate a Trust Builder network, in order to promote open innovation, considering any stakeholder located in the territory or not, can be a strategic and confidence partner. The industrial homogeneity and specificity, as well as a high connection among firms through the value chain, turns this case in an interesting opportunity. However, the analysis should be replicated in other regions, with a strong cultural identity and a sectorial specialization. For that reason, this research is regarded as exploratory in the use of the concept of trust builders and their systemic effects.

The results of the qualitative interviews are introduced below, considering the different role of the Trust Builder, and the stakeholder they have intermediated with. As shown in Table 5, the interviewees have been:

Table 5.- Interviewees. Source: Own made

	Inside the county	Outside the county
Trust Builders	<ul style="list-style-type: none"> • Knowledge Subsystem: <ul style="list-style-type: none"> ○ 1 Director of AZTERLAN –IK4 Research Center ○ 1 University Professor ○ 2 Directors of Vocational Training Centers • Productive Subsystem: <ul style="list-style-type: none"> ○ 2 businessmen 	<ul style="list-style-type: none"> • Knowledge Subsystem: <ul style="list-style-type: none"> ○ 1 University Professor.⁹
Intermediated Stakeholders	<ul style="list-style-type: none"> • Knowledge Subsystem: <ul style="list-style-type: none"> ○ 1 Director of AZTERLAN –IK4 Research Center ○ 1 Director of a Vocational Training Center. • Socio Political Subsystem: <ul style="list-style-type: none"> ○ 1 Director of the Local Development Agency: Behargintza ○ Associations: 	<ul style="list-style-type: none"> • Knowledge Subsystem: <ul style="list-style-type: none"> ○ 1 University Professor. • Socio Political Subsystem: <ul style="list-style-type: none"> ○ 1 Director of Basque Public Administration: SPRI ○ 1 Director of Spanish Public Administration: MICCIN

⁸ There is no information about projects executed without public financing. Thus, the business cooperation data would be higher than the indicator offer.

⁹ An inhabitant in the county, even though he is professor in the Basque Country University, which is not located in the county.

	<ul style="list-style-type: none"> ▪ 2 Business Associations ▪ 1 Casting industry association: “Instituto de Fundición Tabira” • Productive Subsystem: ○ 7 businessmen 	
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Firstly, we questioned the interviewees about the **existing cooperation relationships** inside the county, in order to receive their opinion about a possible evolution in the cooperation tendency. Surprisingly, the firms consider they keep a high cooperation ratio within the territory, centered in relationships inside the value chain they work in. The rest of the players do not consider there is a real cooperation in the county, but just client-supplier relationships, and even less, that those relationships are promoting open innovation projects or activities. The most pessimistic stakeholders are the knowledge centers located in the county, this is, research centers and vocational training centers, strongly underline the idea of just client-supplier relationships. On the other hand, the University professors consider there are slight attitudes that promote a higher cooperation level between the players. In particular, they consider that the need is to promote jointly actuation plans, identifying the benefits each entity would obtain from the cooperative relation. The Public Administrations, the Associations and the “Trust Builders” corroborate that slowly cooperative relationships are emerging, and join actions are being performed, as it points out the cooperative project increase. However, none of these stakeholders thinks that the results of this intermediary process and the evolution in the cooperation relationships could be analyzed in less than 5 years.

Therefore, attending to **coopetitive projects**, all the interviewees think that the county requires a higher business maturity, in order to normalize those interactions. Once again, the knowledge subsystem inside the county is central about this matter. Those knowledge players consider that the sectoral homogeneity might turn into many opportunities between similar firms, and the number of projects performed between competitors is really small. They consider that cooperation would not be a real matter in the county, till coopetitive relationships are not normalized. On the other side, the intermediaries think the role they have played could ease those actions in the short term. They remark that when starting an individual diagnosis, firms always asked for competitors not to access the results or the competitive improvement vias identified for each organization. They point out that this might happen because the firms of the county have not a manufacturing product and are mainly manufacturing services providers for intermediary clients, so final clients do not appreciate the tasks they carry out. In order to solve this problem, they think firms should move forward in the value chain, and they could offer joint solutions to the final clients. In this way, *a casting firm should not just sell a casting piece to a client, but a group of firms would offer the casting piece, already treated, machined, etc. according to the knowhow and technical competence of each organization*. For their part, the interviewed firms consider a chance to cooperate with their local competitors, in long term new technological projects, far from their regular markets. They consider the execution of three coopetitive projects in Casting, Stamping and Machining (See table 3), is due to the economic crisis in the automotive market, principal client of the county firms.

The next point to question about is the role of the “Trust Builders”. All the stakeholders of the county and those cooperating with them consider the reason for the opening towards the Trust Builders is the economic **crisis**, and the invoicing and exportation decrease. These facts makes firms and partners to search for new opportunities in order to improve the competitive advantage and keep or increase the market fee, through cost reduction, identification of new products to perform in the present market, or new markets discovery. The stakeholders that underline this matter are the firms and the knowledge players.

When directly asking about the role performed by the Trust Builders, all the intermediated interviewees (See table 3) consider their labor has been very interesting, emphasizing they have started the intermediary process with heavy market decreases and firms closures. That’s why firms and knowledge players consider the most important individual tasks have been technological optimization projects, in order to reduce processes cost, even though there are other opportunities to perform. However, those interviewees believe that the role performed by Trust Builders in identifying cooperative projects is very important, since they propose different alternatives of promotion different to the present situation of the firms. Besides, there are also joint proposals that include the dual labor performed by possible cooperative firms, to offer value added goods inside the local value chain.

All the interviewees consider positive to have an indicator list to keep the record of diagnosis realized, technical sessions, common projects, etc., (See Table 4) to make a first evaluation of the performance between Trust Builders and Productive Subsystem.

In order to explain the **opening between firms and Trust Builders**, the knowledge subsystem as well as public administration focus on the importance of informal and personal relationships, due to having common values, culture, and being members of the same region, etc. They believe that those trust personal, formal or informal relationships drive to this opening, so they rely on those intermediaries, and their proposals. On the other hand, knowledge players do not think the system could be characterized as opened, but they believe it is a first step. This small step, is totally appreciated by firms, associations and public administrations. They consider it a beginning that should go on with more details in order to structure an open platform. All the intermediated interviewees understand the role of the **Trust Builders as Open Innovation Intermediary**, even though they have not be equally accepted by all of the firms. Those that have integrated better the new attitude are the knowledge, institutional and economic support players, being the productive firms more reluctant, even though there are differences among them.

7. Conclusions and further research.

In the state of the art, the role of Intermediaries has either been mainly addressed by public societies belonging to local development agencies, or by organizations such as consulting firms, engineering firms or technology centres (Howells, 2006). Only Giaretta’s study (Giaretta, 2013) analyzes the case of nonprofit retired businessmen cooperating with the productive subsystem in order to promote individual competitive advantages. However, are just businessmen the ones that should cooperate with the productive subsystem?

We consider counter-productive to limit the belonging of the Trust Builders only to the productive subsystem. That could cause concentric circles among which the knowledge would

spread, without introducing new possible sources of knowledge. In this way, the system could suffer a block-in effect. That is the reason for proposing a Trust Builder network symbolizing the regional heterogeneity.

Besides, the intermediary network offers a double perspective: Promoting competitive advantage of the territory, as well as promoting the competitive advantage of the players inside it. All interviewees, no matter if they are trust builders or not, agree on the double perspective of Trust Builders, the rationale being “improve each one, to progress together”. This behavior is expected to contribute to a forward business cooperative culture. Therefore, the organizations Trust Builders intermediate with, understand and recognize that double perspective.

However, not all the members of the county share the same opinion about the cooperative culture inside the territory. For Knowledge players it is necessary to strengthen the cooperation relationships and promote knowledge sharing. They consider that, even though Trust Builders have initiated this process, it will take time to assume the cooperative implications and create opportunities and knowledge bank. The interviewees recognized the role of Trust Builders as Open Innovation Intermediaries, even though open innovation practices are not accepted equally by all the manufacturing firms.

Attending to the answers of the interviewed people, the crisis could be an exogenous factor to the promotion of the collaboration between different stakeholders when searching for the identification of new opportunities. In this regard, the state of the art identifies contrary research streams in trying to explain the impact crises have on cooperation and synergies. On the one hand, some authors believe crises make difficult to promote synergies or new trust relationships in an unsteady market (Nelles, 2011). On the other hand, other authors consider cooperative relationships could grow thanks to crisis situations. An unstable environment can be a suitable moment to search new opportunities, through collaborative relationships with previous acquaintances or new stakeholders (Birchall & Ketilson, 2009; García Gutiérrez-Fernández et al., 2006). That's why this trust builders' performance in a crisis time can be justified for a historic tendency of trying to get new relations with stakeholders around the value chain. For that reason, it would be interesting to further analyze the results obtained at the systems level as a result of the role played by Trust Builders in a stable market, without economic crisis, where the firms have clearly defined their goals and strategies.

The answers of the productive and knowledge subsystems underline the role of Trust Builders to identify new opportunities, so as to advance in the value chain, and provide more value-added to the final customer. In the specific case addressed in the paper, the metal industry could be characterized as a sector driven by mature technologies and SMEs, where tacit knowledge and synthetic knowledge bases are key to its functioning (Kaminski et al., 2008). In this sense, one could wonder if the role played by and the effects observed as a result of the participation of Trust Builders would be similar in a subsystem dominated by large firms, which use more advanced technologies, and in which explicit knowledge and analytic knowledge bases are central to its development (Jensen et al., 2007). Biosciences or nanosciences could be examples of this latter approach. Exploring this further research path would demand identifying territories which count with a strong positioning on these industries and where intermediaries and trust builders are also identified.

A characteristic of Trust Builders is the acceptance of the different stakeholders inside a territory. In this case, Trust Builders had the reliance of the firms, which has been analyzed in previous research (Porto, 2014). Then, it is because of the confidence in those intermediaries that the intermediation process could be performed. For that reason firstly, it should be

empirically explored, which stakeholders located in a region do firms trust in (Boussouara & Deakins, 2000). Once identified, in order to define the trust network, it would be necessary a qualitative approach and direct observation.

Finally, the social overlapping of the county stakeholders, independently of the subsystem they form part of, are key aspects to explain the influence of the Trust Builders in the county. Besides formal relationships, between industrial firms, knowledge generators, etc., informal relationships might be important, too: *friend or family ties, the fact of having studied in the same schools or training centers, or being part of the same associations, attending the same social events*, for example. These relationships could, in large part, explain the access of the Trust Builders (Kramer & Tyler, 1996; Lane & Bachman, 1998) to the firms of the county, to make individual situation diagnosis. However, it should be empirically compared the influence of formal and informal relations (Allen et al., 2007; Lawson et al., 2009). In this sense, there are studies in the state of the art that identify innovation projects born from informal relationships, in economic crisis periods (Ceci & Iubatti, 2012).

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