The Role of Social Capabilities in Innovation and Competition in an Industrial Cluster: a Case Study [1]

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Abstract: Unlike the neoclassical production function, social capabilities and knowledge represent key variables to understanding recent changes in structure, innovation and competitiveness of an industrial cluster. In this work, the peculiarity of knowledge rests in social capabilities or social abilities to augment the process of the accumulation of knowledge and the broadening of the network. The former depends on the degree of cumulativeness, and appropriability, represented by the capacity of new knowledge to generate further new knowledge and innovation. The aim of this research is to analyze the key role that knowledge, social capabilities and innovations play in the transfer and diffusion of tacit knowledge in an industrial cluster and how this creates new knowledge and innovation, thus improving productivity. The theoretical part of the discussion is focused on the definition of the cluster's knowledge and social capabilities and on the relationship between these and innovation. The focus also examines how it is possible to measure social capabilities within a district. The empirical aspect remains based upon the results of face-to-face questionnaires conducted with a sample of entrepreneurs specializing in the production of ceremonial clothing in the province of Bari, the regional capital of the Apulia Region in southern Italy with the analysis also measuring social capabilities.

Keywords: Social Capabilities, Knowledge, Innovation, Industrial Cluster, Southern Italy

JEL: D8; O31; L67

1.Introduction

The relationship between knowledge and innovation is fundamental inasmuch as the former feeds the latter and is then fed in its turn. It represents a decisive factor in the survival of businesses in a global market for the creation of continuous competitive advantage, and provides a basis for their performance.

Innovation can be considered as the eventual outcome of the processes of knowledge creation, knowledge being the output of innovative activities and the main input to the knowledge production function. At the same time, a growth in knowledge is increased by technological change. Market competition and changes in consumption work to reduce some of the traditional elements of geographical localization. Consequently, elements of proximity and competition, such as geographical dispersion, have to be combined with spatial concentration (Guerrieri-Petrobelli 2004), making it necessary for businesses to create knowledge through local and external networks. This renders international knowledge and the firms' organization increasingly important for the

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performance and evolution of an industrial district. The role of Social Capabilities is fundamental at this point in the transfer and diffusion of tacit knowledge and in the creation of new knowledge and innovation. These aspects are discussed in the theoretical part. In the empirical part, we focus our attention on the results of a survey conducted on a sample of entrepreneurs in a local productive system in southern Italy specializing in ceremonial dresses to illustrate how innovative capacity, generated by knowledge as well as by social capabilities and interactions, induces changes in the sector's competitive dynamics. We measure the social capabilities, requiring data collection through interviews designed to obtain information, permitting the development of qualitative and quantitative indicators.

2. Knowledge and Social Capabilities in an Industrial Cluster

It is important to consider both the transfer of knowledge and its transformation from personal to social as well as from corporate or organizational to cluster or inter-organizational knowledge. According to Nelson & Winter (1982), Nonaka & Takeuchi (1995), Grant (1996), Spender (1996) and Howells (2002) it is not only individuals that are able to create knowledge. It is necessary to distinguish between individual or personal knowledge, and social or group knowledge, what Metcalfe and Ramlogan (2005) call "understanding", as opposed to organizational as well as inter-organizational knowledge. This having been said, organizational knowledge cannot exist without individuals. Initially, individual knowledge is private, it is in the mind of the individual, and is difficult to transfer because it derives from perceptions, memory, inferences and experiences allied to reason (Metcalfe and Ramlogan 2005).

Depending on the conceptual system employed, a range of different personal knowledge of the same object may exist (Putnam 1993). When individuals interact within the same geographical or local space or context, using a common language, personal knowledge is augmented and becomes interdependent. It then becomes social knowledge that is collective, and is derived from individual interactions.

In terms of its internal structure and its organization, a firm may be considered to be a social and/or knowledge system (Tsoukas 1996), within which workers exchange ideas, opinions, information, experience and knowledge. It is necessary to specify that firms and organizations have no self-knowledge in the direct sense. Knowledge can be shared within the firm, among customers and managers, managers and employees or managers and buyers, who together help to create new knowledge. The organization and the internal structure of the firm form a social system. According to Barney (1986, 1991) organizational knowledge can be considered a competitive advantage, and makes an important contribution to the firm's success by acting on its formulation of strategy. Therefore, amongst firms, it is information - not knowledge - that is transferred, enabling each firm to retain its competitive advantage. Knowledge becomes available through publication, patents, informal networks, trade and goods. It is possible for knowledge to be transferred between partners that are part of an cooperative inter-firm arrangement or a strategic alliance (Collins and Hitt 2006).

Cooperation can reduce competition and networking may enable organizations to access complementary resources. In any given geographical area, the relationship between firms and the circulation of workers facilitate the exchange of information/knowledge and transform organizational/firm knowledge into inter-organizational or cluster knowledge. In fact, when firms are spatially concentrated, knowledge externalities will be more frequent and intensive (Krugman 1991). However, these will be dependent on the types of relationships that are established in terms of horizontal and /or vertical integration.

In a district, social networks form more easily, stimulating transfers of information and inputs, which generate new knowledge to an extent determined by the firm's abilities or social capabilities.

Any industrial cluster is characterized by specific social capabilities. In the literature on industrial districts, human resources are seen as workers with specific knowledge, skills and capacity and it is a system which becomes a place where capacities are stimulated, scientific potential is used and technology is developed. More specifically, in any society, we need to consider the steps based on knowledge and on agent relations as they are at the core of any growth process.

At the same time, firms in clusters are characterized by heterogeneous knowledge bases and the knowledge that resides in the firms' skilled knowledge workers. The aggregation of a business's workers' various competences and abilities constitute its capabilities, or the social capabilities of the industrial cluster. Consequently, the key determinants of the birth and performance of an industrial cluster can be found in the historical and cognitive reasons explained by the economic, social, cultural and institutional relations that characterize a population in a specific territorial context. Geographical proximity alone is not sufficient to generate learning and knowledge (Maskell and Malmberg 1999; Amin and Cohendet 2004).

To identify the social capabilities in industrial clusters it is necessary to remember that this organization (Marshall 1890) echoes Darwin's theory of natural selection. The analogy between economics and social science stresses that every part of an organism is dependent on the other parts for the achievement of wellbeing. Productive capacity depends on the accumulation of knowledge and the growth of industries and is increased by the character of the people and their social and political institutions. Other elements that characterize social capabilities are identified as the spatial and moral forces (Becattini 1981) that bind nations together; the geographical, cultural and social proximity of firms as well as the decentralized phases of product processing.

Social capabilities are sometimes seen as a sort of "residual" resource, an intangible factor, "some sort of measure of our ignorance about the causes of economic growth…the mysterious element of total factor productivity growth" (Abramovitz 1989, p. 15).

The role of physical and human resources and Penrose's collective knowledge (1959, 1985) is fundamental, not only for providing a new way of conceiving social capabilities, even if she does not use this term expressly, but also for company growth. The competence of the company in question is the sum of individual competences, and the company employees' own knowledge, that can also have the capacity to increase through learning by doing.

In this research the definition of social capabilities adopted is wider than that used by either Abramovitz (1989) or Ohkawa-Rosovsky (1973)**,** in that it is integrated with the notions of Marshall (1890), Penrose (1959, 1985) and Becattini (1981). It is associated with enlarging the knowledge-learning process and network diffusion and plays a key role in the transfer and diffusion of tacit knowledge within an industrial cluster.
Taking into account these aspects, elements of the Social Capabilities in an industrial cluster include:
1) Spatial conditions: industrial concentration
2) Social conditions: tradition, story, skills and ability, knowledge, events, collective knowledge, social relationships
3) Economic conditions: innovation, human resources and education, organization, knowledge, markets, company relationships
4) Political conditions: social and political institutions
5) Innovation

3. Knowledge and Social Capabilities in Innovation

If knowledge is considered to be a public good, the idea that technology is like "manna from heaven" is a logical consequence of the neoclassical model. In this context, technology or any other form of knowledge is not an economic problem. If knowledge is not considered a public good, but rather a collective or club good, however we consider it, technology is not appropriable and the productivity process generates learning. Technology becomes the crucial factor for the competitiveness of companies and of a country. At the same time the essence of technology and innovation is knowledge. In fact, if innovation depends on the level, variety and pervasiveness of knowledge, then the effectiveness of innovation and its ability to give monopoly to the firms will be positively proportional to the level of appropriability of that knowledge, and negatively proportional to the degree of externality within the industrial sector. Time, as we know, decreases monopoly power, allowing the potential for imitation. Consequently, a company requires constant innovative actions to increase its competitiveness and to maintain its market share. A process of knowledge accumulation that produces innovation is much needed. The relationship between knowledge and innovation does not, however, only involve large enterprises but small and medium-sized businesses as well, where innovation is to be understood not only as an investment in research and development and in the adoption of new technologies, but also as the gradual change of types of product, adapting to constant changes in consumer tastes, implementing new organizational methods, both internally and in their relationship with other companies, customers and suppliers (Cappellin 2010) as well as creating new types of contract, means of distribution, marketing slogans and new individual ways of working (Tether et al. 2005), marketing and design innovation.

The company represents the organization where technological knowledge is produced through a process of the integration of learning and formal research and for this reason it is a place of specific competences and capacities. Thus, we can say that a firm's capacity for accumulation of knowledge produces innovation that is tightly

connected to the acquired competences and, above all, to those acquired through research.

Within districts and networks generally, innovation, technical progress and capital accumulation determine the increase in productivity and development, while technical progress can also be derived from common management of the processes of production. The combination of codified and tacit knowledge leads to localized knowledge (Antonelli 1996, 2008; Metcalfe 1999; Ibrahim et al., 2009; Casanueva et al., 2012), which is not easily imitable and is characteristic of industrial districts. Over time, companies that operate in industrial districts accumulate experience of production techniques, learn from their own and others' mistakes, interact with suppliers and customers and share the information collected, all of which enables them to increase yields using known techniques. In the neoclassical model, exogenous changes in production and utility functions cause changes in the behaviour of the operator, but not in the structure of their preferences. When the preferences and technologies are endogenous, the social interactions simultaneously modify and complete those of the market (Hanush H. & Pyka A. 2007). In other words, each firm and each consumer changes its behaviour because of their interactions with one another. This makes access to external knowledge easier, which generates new technological knowledge and, from this, innovation. In fact, if we consider knowledge as simultaneously being both an input and an output, the crucial role of the external in generating technological knowledge cannot be ignored.

In the light of these considerations one can verify whether or not social capabilities play a key role in the transfer and diffusion of tacit knowledge in a traditional sector such as the ceremonial/garment industry, in which it has better chances of competing on quality, design, fashion and innovation.

4. Empirical Analysis in an Industrial Cluster of Apulia Region

Based on the theoretical part of this paper and on the definition of Social Capabilities, the questionnaire utilized is structured on five main levels: (i) general information about the firm and about the function of the respondent; (ii) an exploration of the innovation and marketing activities of the firm; (iii) the collection of data on knowledge exchange with the use of source information connected to innovation knowledge and market knowledge; (iv) the collection of information on common space in a firm, number of formal or informal meetings; (v) the gathering of information about contact with institutions and other firms, their location and the type of company in question and the nature of the connections.

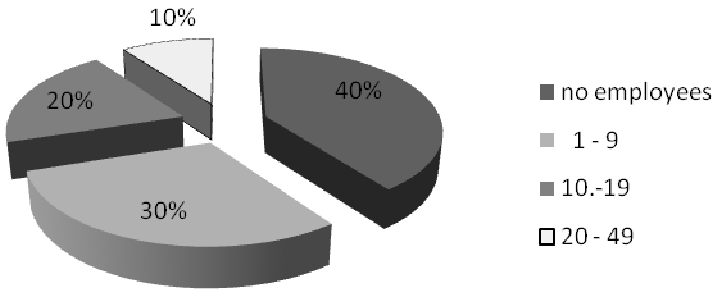
The results are presented of an investigation conducted in 2011 for the province of Bari, the regional capital of the Apulia Region in southern Italy, carried out through the administration of questionnaires to producers in the ceremonial clothing sector. The choice of the sector resulted from its having taken over the leading position in the textile and clothing industry in the Apulia region, with the presence of *c.* 7,000 businesses and 38,000 active employees (*Osservatorio nazionale dei Distretti*

Industriali 2011). In particular, the province of Bari produces 60-70% of the wedding dresses that are certified as being Made in Italy.

Of the 54 companies in the sector under examination, 30 of them were interviewed for the questionnaire. Of these 36% have their operational headquarters in the municipality of Bari and 37% in Putignano, an area specializing in the production of wedding and ceremonial dress, the remaining 27% being located in other areas of the province of Bari. The survey shows that 20% of the enterprises in question were started in the 1960s and 40% in the 1980s and that they are mostly individual businesses and, to a lesser extent, capital companies.

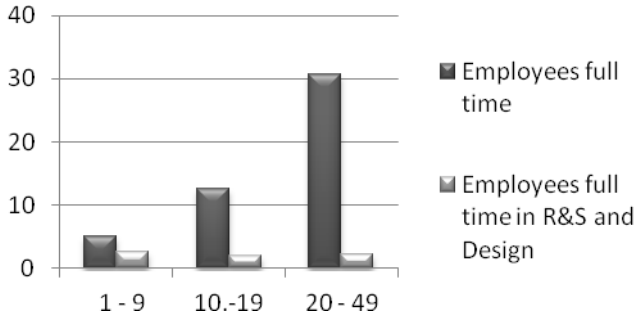
An examination of the size class (Figure 1 and 2) shows that 40% of the firms have no permanent but only seasonal employees, 30% are micro-enterprises with an average number of 5.1 employees, 20% have an average of 12.5 employees and only 10% have an average of 30.6 permanent employees.

Figure 1: Number of employees according to firm size



Source: *data collected during our investigation*

Figure 2: Number of employees and workers in R&D and Design according to firm size



Source: *data collected during our investigation*

Analysis of the questionnaires also revealed that the number of employees has been reduced considerably over the period 2001-2011, dropping, at least in the cluster in question, from an average of 35.6 to 7.1. The lower number of first marriages in Italy – dropping from 392,000 in 1972 to 197,000 in 2009 (ISTAT 2010) – as well as the current economic crisis and the adoption of new technologies which improve worker productivity, may explain the contraction in employment levels for the cluster as a whole, in which, when staff reach pensionable age, they are not replaced.

4.1 Measuring the Social Capabilities

4.1.2 Methodology and Data-set

The empirical analysis is soundly-based on the use of a large data-set constructed using questionnaire responses.

The information derived from the questionnaires allowed us to measure Social Capabilities in the industrial cluster.

Social Capabilities (1) depends on 8 variables:

(1) $SC=f(IC+MC+GS+FN+SN+IN+KEfromIK+KEfromMK)$
where:

IC represents innovation capabilities

MC represents market capabilities

GS represents the concentration of firms

FN represents the firm's network

SN represents the social network

IN represents the institutional network

KE from IK is the knowledge exchange connected to innovation knowledge

KE from MK is the knowledge exchange connected to market knowledge

We have used a composite indicator (2) for each of the variables.

(2) $I_n=(X_i-X_{min})/(X_{max}-X_{min})$

We have taken into consideration all the companies that responded to the questionnaire. It proved necessary to normalize each indicator for each firm, where *I* is the considered indicator, *n* is the firm number and *X* is the considered variable. The result is between 0 and 1. It takes the value 1 if a company has a good performance and 0 otherwise. As one can see from Table 1, the composite indicators IC, MC, FN,

IN KEfromIK, and KEfromMK are highly positively correlated with the Social Capabilities. The indicators GN and SN are less significant but in any case positive in that from an analysis of the results, this is a local production system and it does not seem to have the characteristics of the cases identified in the literature. In fact the GS indicator presents the lowest coefficients of correlation even though they are all positive. SN is less correlated because the knowledge is transmitted only within the same company, while with their competitors the exchange of information on upstream or downstream phases of the process is limited.

Table 1: Correlation between SC and KI, KM,GS,FN,SN,IN, KEfromIK, KEfromMK

	SC	IC	MC	GS	FN	SN	IN	KEfromIK	KEfromMK
SC	1.00								
IC	0.73	1.00							
MC	0.84	0.73	1.00						
GS	0.44	0.32	0.34	1.00					
FN	0.92	0.64	0.68	0.24	1.00				
SN	0.49	0.34	0.39	0.10	0.35	1.00			
IN	0.71	0.34	0.38	0.01	0.73	0.37	1.00		
KEfromIK	0.91	0.58	0.64	0.23	0.95	0.35	0.81	1.00	
KEfromMK	0.878	0.552	0.862	0.292	0.779	0.346	0.571	0.75	1.00

After the construction of the Social Capabilities indicator, we verified how they impact upon the performance of the firms in the cluster. The variables used to measure performance were innovation, size and marketing.

We estimated the following linear regression (3) using OLS method:

(3) $SC_{i,t} = \beta 0 + \beta_1 lnlab_{i,t} + \beta_2 Indprodexp_{i,t} + \beta_3 Indprocexp_{i,t} + \beta_4 Cadcam_{i,t} + \beta_5 Indrdd_{i,t} + \beta_6 Inndom_{i,t} + \beta_7 Innorg_{i,t} + \beta_8 Indmark_{i,t} + \varepsilon_{i,t}$

where:

- $SC_{i,t}$ represent the social capabilities of firm *i* in period *t* given by function (1);
- $lnlab_{i,t}$ represents the log of labour number *i,t*;
- $Indprodexp_{i,t}$ is the product experiment indicator of firm *i* in period *t*;
- $Indprocexp_{i,t}$ is the process experiment indicator of firm *i* in period *t*;
- $Cadcam_{i,t}$ represents Cad or Cam use; it is used as a dummy that takes the value 1 for its use by firm *I*, value 0 otherwise;
- $Indrdd_{i,t}$ is the investment in R&D and Design indicator of firm *i* in period *t;*

- $Inndom_{i,t}$ represents demand-driven innovation; it is used as a dummy that takes the value 1 for use by firm *I*, value 0 otherwise;
- $Innorg_{i,t}$ is the innovation derived from new organizational methods; it is used as a dummy that takes the value 1 for use by firm *I*, value 0 otherwise;
- $Indmark_{i,t}$ represents the indicator of expenditure in marketing of firm *i* in period *t;*
- $\varepsilon_{i,t}$ is the error term

4.2 Empirical Results

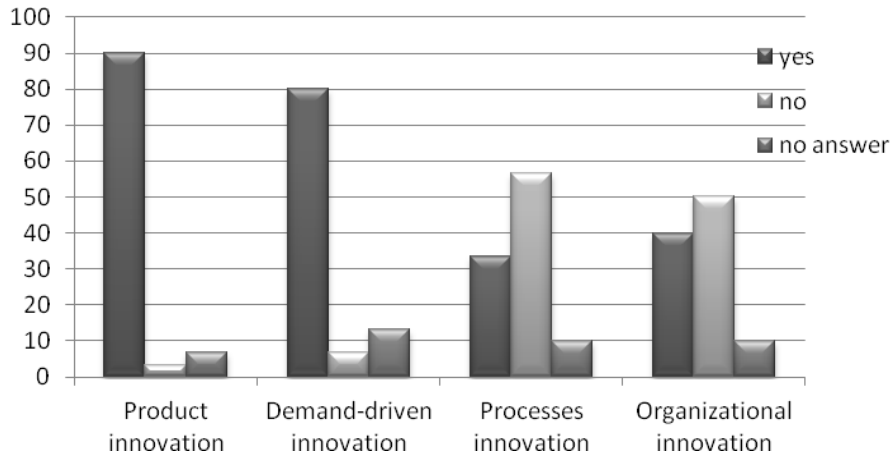
Our empirical results are presented in Table 2, which presents some interesting evidence with regard to the impacts that the Social Capabilities have on a cluster. Many variables are not significant and do not produce effects on SC. One, that the investment in R&D and Design is negative is expected. The value of R-squared is high. This implies that our linear regression explains the dependent variable, the Social Capabilities. It could mean that in this traditional and low-tech category, the Social Capacities are important for the performance of the cluster in terms of incremental innovation and with regard to demand-driven innovation.

Table 2: Linear regression estimates

Dependent Variable	**Method**	**Variable**	**Coef.**	**Robust Std. Err.**	**t**	**P>t**
SC	Least Square					
		lnlab	0.032	0.030	1.04	0.312
		indprodexp	0.109	0.055	2.32	0.023
		indprocexp	0.158	0.093	1.70	0.104
		Cadcam	0.102	0.067	1.52	0.143
		indrdd	-0,176	0.107	-1,64	0.116
		inndom	0.167	0.065	2.55	0.019
		innorg	0.009	0.064	0.14	0.888
		indmark	0.065	0.104	0.62	0.540
		cons	0.124	0.059	2.09	0.049
N. of obs.	30					
R-squared	0.700					

A really encouraging result is that the companies interviewed pay particular attention to product innovation (Figure 3) that in small companies is carried out through the presence of an average of 2.3 employees for research and design, a number that rises to an average of 3 units in micro-enterprises. Product innovation is closely linked to the fabric used in the groom's suit with 100% of consumers preferring a classical style and not the cut of the suit as is more often the case for the bride, for example, with a study of the structure of the bodice. In most cases (80%), innovative activity is induced by the requests or preferences of the bride-to-be, and only in 18% of cases for a casual dress, 36% for a modern one and predominantly, equivalent to 46 %, for a classic look, almost always enriched with a detail that makes it unique and different for the wearer. The lively innovative performance, met with in this traditional sector, reflects the importance that is attributed to the exchange of information and knowledge, seen both from the side of the consumer and that of the manufacturer.

Figure 3: Levels of innovative activity in enterprises



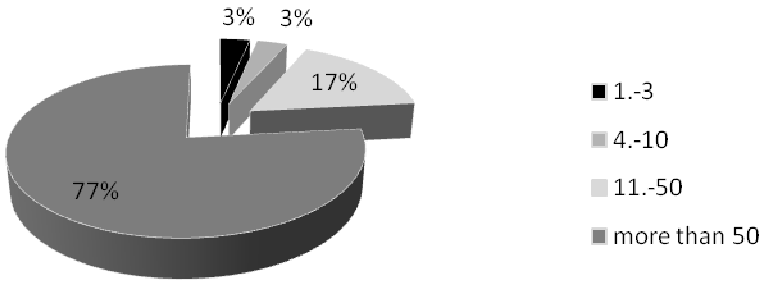
Source: *data collected during our investigation*

The effect of product experimentation and innovation derived from demand on the dependent variables is, in fact, very important, even if this activity is carried out in-house in 87% of cases and in only about 7% of cases in cooperation with other companies.

Demand-driven innovation is significant because the number of customers (Figure 4) is more than 50 for 77% of companies, and among these, some are working for 180-200 annually even though 3% have a numerically lower, but select number of customers (1-3 or 4-10). The customer data derived from the responses to the questionnaires may, in our view, also include companies that commission the full package of clothes onto which they then put their own label with an exclusivity clause. In this case, some of the microenterprises produce both independently and for third parties.

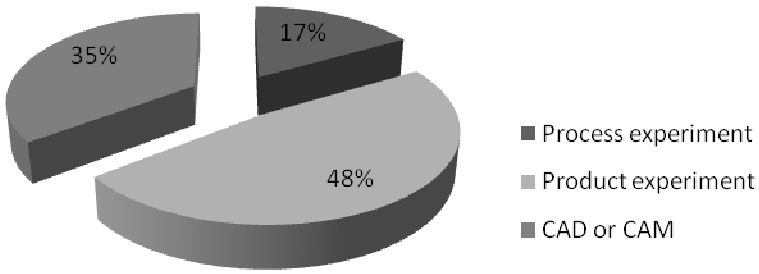
In about 30% of companies surveyed the distribution of the finished product is done through wholesalers, or directly to retailers, both Italian and foreign, while some companies do not have their own points of sale. The companies do not relocate their production activities abroad, but limit this to the marketing, approximately 17% of which is achieved through the signing of contracts with agents, importers and distributors. In a few cases (*c.* 3.3%) agreements are signed with third parties. For this reason the innovation derived from new organizational methods is not significant. In 35% of cases the prototypes are processed and manufactured using CAD (Computer-aided Design) or CAM (Computer-aided Manufacturing), and in other cases are drawn by hand. The companies also carry out experiments with regard to processes in 17% of cases and the product in 48% (Figure 5).

Figure 4: Number of customers per business



Source: *data collected during our investigation*

Figure 5: Developing prototypes and the use of CAD or CAM



Source: *data collected during our investigation*

The innovation process, carried out by 33.3% of companies, culminates in the purchase of new machinery and the use of CAD or CAM, in order to improve production efficiency. 40% of companies surveyed are also careful to innovate with

regard to their organization and marketing through websites that for 73% of the companies makes market access easier, facilitating contact with consumers.
Attention is also devoted to the process of staff training which for 10% of respondents translates into a cost of between 5,000 and 10,000 euros and 20% in skills costing up to 5,000 euros.
Despite the great attention paid to innovation, spending on R&D and Design, in 2011, for 20% of the companies, did not exceed 5,000 euros (Table 3), reaching more than 20,000 euros for 14% of firms and in only a few cases, especially s.r.l (ltd.) companies, is there a higher than average size class with higher spending as much as 50,000 or 90,000 euros. In fact in this case the value of investment in the R&D and Design variable is negative.

Table 3: Expenditure in innovation and training (2011)

Budget	**Expenditure in innovation and training**		
	Expenditure on R&S and Design (%)	***Expenditure in Learning (%)***	***Expenditure on skills (%)***
Up to 5,000	20.0	7.0	20.0
From 5,000 to 10,000	0.0	10.0	2.0
From 10,000 to 20,000	3.3	4.0	3.3
More than 20,000	14.0	0.0	0.0
N/A	63.0	79.0	75.0
Total	100.0	100.0	100.0

Source: *data collected during our investigation*

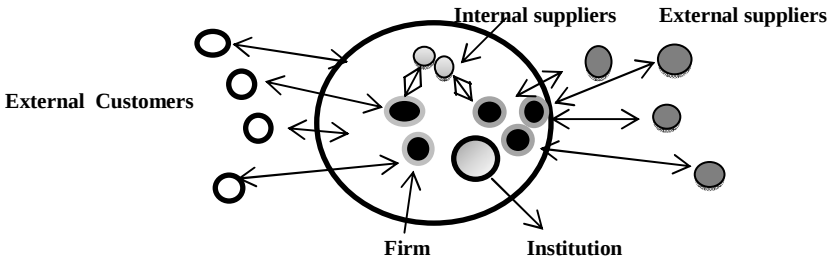
The dimensional variable was not very significant because local companies, often small or very small in size, do not cooperate with each other, limiting themselves to exchanges of information on suppliers or distributors to reduce transport costs, while no innovative knowledge or market information is exchanged.
Even if relations with the majority of external buyers are established at industry events reserved for professionals working in the sector and the participation in local events reaches 80%, the indicator of expenditure in marketing is not significant with less than 7% participating in trade fairs and fashion shows that take place both in Europe and the United States and Latin America. The expenditure for marketing is not elevated, but all companies have a web site and the quality of these is high.

5. Conclusions

The analysis conducted shows that in the field of ceremonial dresses local companies, often small or very small in size, do not cooperate with each other, limiting themselves to exchanges of information on suppliers or distributors to reduce transport costs, while no innovative knowledge or market information is exchanged.

Nor do they invest heavily in R&D, as the empirical results of the survey show. On the other hand, the social capacities are important for the performance of the cluster in terms of incremental innovation and for demand-driven innovation. External relations are the primary source of knowledge (Fig.6), which is transformed into innovation through social interactions and social abilities. These, however, are engaged in within each firm as well as between the entrepreneur and his collaborators, including suppliers and designers, but it would seem that the ability to organize and create the system both locally and internationally is still at an embryonic stage.

Figure 6: Ceremonial Clothing Industrial Cluster



The exchange of knowledge between companies that are direct competitors producing goods that are close substitutes but differentiated in terms of quality and design in order to meet the needs of consumers is, in fact, absent. The knowledge is transmitted only within the same company, while with their competitors the exchange of information on upstream or downstream phases of the process is limited.
This deficiency could be overcome if the synergy with the institutions, sought by many of the companies surveyed, were to be realized.

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