Chapter 28

Collaborative Innovation — A Focus on Food SMES

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1. Introduction

1.1. Collaborative innovation: A set of agenda

During the last years, the topic of 'collaborative innovation' has become the dominant perspective in the innovation literature by the argument that innovations are effectively developed through the interplay between different parties from different organizations (Steinle and Schiele, 2002; Trott and Hartmann, 2009; Nootebom 2004, Chesbrough, 2006).

In the SME context, the development of well established networks for innovation has been understood as necessity more than a choice (Goss, 1991; Pratten, 1991, Rothwell and Dodgson, 1993,). A large body of literature indicates that participation in networks and engagement in partnerships are important for SME as these factors enable firm toto tackle new technological and market frontiers and to cope with the fast changing environment (Hanna and Walsh 2002; Van de Vrande et al. 2009).

Main advantages are the access to network competencies as well as the opportunities of engaging into supply chain innovation processes and of growing in collaborations with larger customers (Johnsen and Ford, 2006; 2007). At the same time, collaborative innovation creates challenges to SME resulting from the inability to nurture and maintain the necessary resources and capabilities for growing (Matthyssens, Vandenbempt, Berghman 2006), to build a competitive positioning (Colurcio and Russo Spena, 2009; Day and Nedugady, 1994) and to create value for the own company and for the network (Johnsen and Ford, 2006; Donada and Nogatchewsky, 2006; Ulaga, 2003).

Recently, the network perspective have triggered a fervent debate on the generation of knowledge and learning in inter-organizational and network collaborations (Dyer and Singh 1998; Nooteboom 1999, 2004, 2006; Lampela and Kärkäinen 2009, Hallikas et al. 2009, Lampela et al. 2008). Collaborative learning in innovation networks is said to stim-

ulate the creation of new knowledge, processes, products and services as well as the motivation for networking itself (Araujo, 1998). Many contributions have demonstrated the role of learning in the context of innovation networks discussing it as particularly challenging but increasingly more important task for companies (Capaldo 2007, Lane and Lubatkin 1998; Inkpen and Tsang 2005, Dyer and Hatch 2006).

However, the integration of diverse knowledge sources and development of learning processes are carried out in relationships between a multiplicity of actors that may show different characteristics of asymmetry. The asymmetries become evident when the relationships involve actors with different positioning and power, as showed by Johnson and Ford (2007). Asymmetries in business relationships have been analyzed from their different perspectives and on their impact on innovation and network development (Mouzas & Ford, 2004 ; Johnsen and Ford 2001; 2006).

From other perspective a wide literature has identified enablers and barriers to network collaboration (Leonard, 1995; Szulanski, 1996; Knott, 2003). Among others Szulanski (1996) has recognized the main role of knowledge, motivation, trust and ambiguity while others researchers also considered the role of the context (the environment) (Nelson and Winter, 1982; Teece, 1986; Pihkala, Ylinenpaa and Vesalainen, 2002). Other studies have showed that the amount of social capital correlates significantly with the competitiveness of collaborative networks (Macke, Vallejos, Faccin, & Genari, 2010).

Despite these contributions we find that little attention has been paid to analyse the collaborative innovation in the context of learning and asymmetric relationships. We aimed at generating insights into attributes of relations and at identifying barriers and enablers to collaboration and learning in innovation networks from the perspective of SME.

We find the issue of collaborative innovation, asymmetry and learning very critical and under investigated to explain the competitiveness and the development of firms.

2. Asymmetric relationships

The study examining the way in which a firm innovates through inter-organizational and network collaborations (Capaldo 2007, Lane and Lubatkin 1998; Inkpen and Tsang 2005, Dyer and Hatch 2006; Nooteboom 2004) has only a more recent tradition.

Many researchers focus on partner characteristics, such as size, interdependence, cultural compatibility and relative influence (Holmlund and Kock, 1996; Pittaway and Morrisay, 2005). They show that these factors may leverage resources to drive innovation but that they can also inhibit innovation. Other authors (Pfeffer and Salancik, 1978; Håkansson and Snehota, 1995; Axelrod, 1964) - although stressing that networking is often the only way to realize innovation within a small size context - emphasize the organizational (resource) dependencies that emerge from networking. Similarly, other contributions that have focused on power unbalance (Hakansson; 1987; Håkansson and Gadde, 1992) find that this relational characteristic may become a barrier to the build up of a fruitful relationship and it may inhibit the

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development of innovation capabilities for smaller partners. Power unbalance is a barrier since business relationships in such a situation are dominated very often by contracting more than by trust (Jeffrey and Reed, 2000; Blomqvist et al.2005); so they don't drive cooperation to innovation but simply consist of a contractual contribution of resources. Important studies are those by Ford and Rosson (1982) and Geser (1992) who have deepened insights about frequency, range and level of contacts between firms.

Although researchers focused on different characteristics which enable or inhibit the development of business relationships aimed at innovation, a common central theme emerged: the asymmetry of relationships. The concept of asymmetric relationships concerns different elements of the relationships such as size, power, resources, and competencies and strongly affects its innovation potential (Blomqvist, 2002; Whipple and Frankle, 2000; Bailey et al. 1998; Colurcio, 2009; Colurcio et al. 2012). On the topic of asymmetric relationships, a relevant contribution comes from Johnsen and Ford (2000; 2001, 2007) who have identified seven types of asymmetries in business relationships: mutuality, particularity, conflict, cooperation, interpersonal inconsistency, intensity, power and dependence.

All these characteristics express interdependency ties among partners involved in the relationship. These interdependencies unequally affect the partners of the relationships. Mutuality is conceived as an "attitudinal variable" since it concerns the willingness of an organization to advantage common goals in respect to its own goals; it requires a long-term perspective since a company may give up its own goals in order to advantage a counterpart. Over time this behaviour will create well-being for both (or all) the parts involved in the relationship. Particularity is the way to manage the relationship and concerns the interaction's level of standardization. It depends on the relational approach of the party and on its availability to customize the relationship and its contents. Conflicts are the essence of asymmetry since it conveys the inequality between the parties and conflicts are amplified by the level of the interdependence of the relationships. The interdependence strengthens the differences and in turn feeds relational pressure and conflicts. Co-operation concerns the willingness of the may concern specific goals or projects but it is mainly conceived as a way to work, as a perspective to manage the relationship and to extract value from it for all the involved parts. Interpersonal inconsistency relates to individual characteristics of subjects that interact in the relationship. Intensity stresses that the number of people who interact in a relationship affects the relationship and its value (cross-functional group; team working). Power and dependence hedges in different kinds of asymmetries and stresses difference in the partners' resource stock.

These characteristics may work both as facilitators and barriers to the development of innovation in a business relationship and affect the evolution of the relationship differently depending on value, culture and managerial system of the SME.

3. Learning process in collaborative innovation

Recently knowledge and learning processes have become the main topics in the agenda of many scholars studying collaborative innovation (Dyer and Singh, 1998; Gemunden et. al,

1999). Among them, the inter-organizational and collaborative network learning perspectives have emerged as distinctive approaches providing a starting point for the analysis of development of innovations in collaborative relationships. The table 1 summaries the similarities and distinctions among these perspectives on the base of three main dimensions of knowledge and learning process in interaction i.e. firm's knowledge base, attributes of knowledge and characteristics of relationships.

Dimensions	Inter-organizational perspective	Collaborative network perspective
Firm's knowledge base and capacity	• Absorptive capacity • Relational, interaction and collaboration capability, • Relative absorptive capacity	• Collaborative competency • Cooperative competency • Network competence • Coordinator or orchestrator capacity • Positioning and visioning
Knowledge and processes characteristic	• Tacit/explicit knowledge • Similarity of knowledge • Specialized knowledge • Similarity and shared routine • Resource and knowledge appropriateness	
Relation characteristics	• Strong/weak ties • Commitment/opportunism • Trust, shared value and culture • Similarity of processes • Shared inter-firm routine	• Multiple and connected relationships • Flexibility of network • Strong ties/loose ties • Managed/unmanaged network
Main references and studies	Dyer and Singh (1998); Lane and Lubatkin (1998); Adler, (2001); Johnson and Sohi (2003); Blomqvist and Levy (2004); Miles et al. (2000, 2004); Lampela and Kärkäinen (2006); Rasmussen (2007); (2002); Hurmelinna-Laukkanen et al (2007); Castaldo (2007);	Ford (1998); Holm et al (1999) Bloomqvist, (2006); Moller and Halinen (1999); Möller and Rajala (2007); Miles et al. (2000, 2004); Ritter et al. (2002); Möller and Rajala (2006); Dhanaraj and Parkhe (2006), Heikkinen and Tähtinen (2006)

Table 1. Learning in inter-organizational and collaborative perspective

The inter-organizational approach

Based on the foundation of organizational learning literature (Cohen and Lenvintal, 1990), the inter-organisational perspective (Johnson and Sohi 2003; Blomqvist and Levy 2004) stresses the firm's knowledge attributes of absorptive capacity (Levinthal, 1990; Koza and Lewin, 1998) as addressing the leveraging of firm's interaction (Lampela and Kärkäinen 2009, Hallikas et al 2009) in a dyadic relationship. Relational capability (Lorenzoni and Lipparini, 1999; Johnson and Sohi, 2003), collaboration capability (Blomqvist and Levy, 2004) and interaction capability (Johnson and Ford, 2006) are different terms used to refer to the ability of a firm to

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recognize the value of external partner's knowledge and to build and maintain high-quality and productive-firm relationships. These relationships have been recognized as important for accelerating the firm's knowledge access with an effect on growth and innovativeness (Lampela and Kärkäinen, 2006). Moreover, the understanding on the interactive process of knowledge flow has been deepened by Dyer and Singh (1998) who emphasized the similarity of the knowledge base and the level of knowledge specialization in learning between partners. Similarly, Lane and Lubatkin (1998) introduced the concept of relative absorptive capacity to take a wide set of characteristics of the partner into account. In addition, Dhanaraj et al. (2004) have showed that the strength of a relationship between firms positively influenced the transfer of both tacit and explicit knowledge, leading to higher performance in learning. Kachra et al. (2008) found that the presence of stronger social relationships and social capital correlates significantly with the innovativeness of learning based collaboration (see also Knight, 2002). Furthermore, scholars studied the role of motivation (Szulanski, 1996, 2002) and appropriability (Hurmelinna-Laukkanen et al, 2007) and identified trust as one of the most effective enablers to inter-firm knowledge and resources transfer because high trust decreases situational uncertainty (Simonin, 1999) and opportunism (Lubatkin et al., 2001) and encourages higher commitment to the relationship (Capaldo, 2007). At the same time, some authors have evidenced also the "dark side" of strong inter-organizational relationships as obstacles for innovation mainly of radical type. The main reason is that a strong relationship locks firms into a narrow network, making them dependent on the inspiration by only a small number of external sources of creativity (Capaldo, 2007) and reduces the likeliness to explore new knowledge paths (Collinson and Wilson, 2006).

The collaborative network learning approach

The focus on structural and social dimension of relationships has been further debated by collaborative learning perspective focused on "learning by a group of organizations as a group" (Knight, 2002). According to Hallikas et al. (2009) the network learning literature represents a novel topic for learning research as the innovation phenomenon becomes increasingly occurring with multiple participating organizations. Emphasizing the aspect of multiple and organized relations (Håkansson and Snehota (2006) and open and interconnected business relationships (Ford et al 2003; Ford and Håkansson 2006), these studies have shed new light on the mix of diversity, variety and continuity of relationships and the way in which they are conductive to learning and innovation. Among them, Möller and Rajala (2007) argued that in innovation networks, knowledge exploration through weak ties, i.e. sources external to well established relationships, is needed, and flexibility of network is essential. They furthermore recognized the role of network orchestration defined by the nodal position held by an actor in a flexible network as crucial from a knowledge transfer point of view, especially *"because such an actor's task is to connect multiple actors in the net"*(Möller and Rajala, 2007; p 899).

The problem related to relational distance has also been discussed according to a cognitive perspective (Argyris and Schon, 1977). The lack of feedback for effective learning processes is seen as very likely when a relatively large number of agents interact with each other in various process steps. So it has been concluded that striving to learn more effectively in network means

to enable trust-based mutual communication and continuous feedback as well as that the coordination and co-operation link between the organizations must be strong and kept active (Blomqvist, 2004; Miles et al., 2000; 2004). Miles et al. (2000, 2005) pointed out that the ability to collaborate in network is a meta-capability for innovation. Similarly, Sivadas and Dwyer (2000) discussed cooperative competency as "*the ability of the partners to trust, communicate, and coordinate*" (ibid, p 40). Moller and Halinen (1999) and Ritter et al. (2002) have developed a concept of network competence to understand the capacity of firm to drive innovation success through the effectively management of actors in the network. Many others authors furthered the role of coordination or orchestrator (Dhanaraj and Parkhe, 2006; Heikkinen and Tähtinen, 2006) and discussed these aspects in term of capacity to 1) support absorptive competences among the network actors, 2) foster articulation and codification of tacit knowledge when it is reasonable and possible, and 3) develop long-term inter-firm relationships and network vision and identities for members (Hurmelinna-Laukkanen and Natti, 2007).

However the ongoing debate on the nature and structure of the network and its impact on learning is far from a final resolution and there are many contributions that support different perspectives. Recent research has found that an open unformed network comprising of numerous and loose ties has to be particularly well-adapted to facilitate new knowledge creation, whereas the more closely and coordinated structure has been found to better facilitate the diffusion, implementation and exploitation of existing knowledge (Hallikas et al., 2009).

4. Research aim

The above summarized literature studies the underlying principles of collaborative innovation at a rather abstract level or within the context of large companies (Chesbrough, 2003, 2006). Studies explicitly focusing on the SME network perspective look at advantages and opportunities for collaborations, whereas an in-depth debate about the asymmetric nature of relationships as well as the mechanisms that enable or hinder the development of effective collaboration and learning processes in SME innovation networks is yet missing. The main objective of our study is to contribute to bridge this gap.

More in detail the aim of this chapter is to provide a relationship approach to collaborative innovation in SMEs', specifically: 1) to investigate the dynamics of SMEs' relationships with partners different by size, power and resources and stock within a network 2) and exploring the barriers and facilitators to learning for Smes' innovation processes.

To address these efforts we chose to investigate in depth the food sector. We put two main points in the base of our business focus. *First*, food collaborative innovation has been analyzed so far mainly within the context of large, multinational firms (Fortuin & Omta 2008) stressing the role of this actors as transfer of formalized knowledge. *Second*, the topic of collaborative innovation of food sector SMS is particularly important as the food market is not very supportive to innovation. It is highly saturated (Sucher, 2007), consumers tend to be rather conservative concerning their food preferences (Rozin & Vollmecke, 1986), and the food industry is not extensively pushed by technical innova-

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tions (Moskowitz, 2008). Innovation is very much fraught with risk in the food sector; 60 – 80% of the new launched products fail (Grunert and Valli, 2001). To realize a successful food product innovation therefore a combined efforts of different network partners - like suppliers (often SMEs) and retailers – is needed for customizing the new product to the needs of the end-consumers (Gellynck, & Molnar, 2009).

Given the difficult market situation of food sector SME as well as the necessity to cooperate for being able to create and launch food innovations, there is a need for research that deepens understanding of how SMEs experience their relationships and configure modes of interaction with asymmetric partners. Also we want deepen the understanding of factors and barriers of food sector SME network learning, fostering integration and creation of new knowledge as antecedents and contribution to innovation and sustainable competitive advantage of all network.

4.1. Selection of industry and sample

For the study, we decided to investigate processing food SME that innovate in network collaborations. An aspect to study is how highly different partners like SME suppliers and large retailers can cooperate for innovation despite – or because of - large power asymmetries (Gellynck and Molnar, 2009; Colurcio et al. 2012). Beside product innovation, a network is also needed for the so-called "immaterial" organizational innovations like the adoption of quality standards and methods are of tremendous importance for food SMEs (Padel, 2001). Without network partners, these innovations would be out of their reach as they require inter alia scale economies in audit, control, certification activities.

Literature suggests that the opportunities for collaborative innovation depend on the market conditions (Chen and Chen, 2002).

Our sampling strategy followed three criteria: *First*, all selected companies had to be SME, i.e. have between 1 and 250 employees. *Second*, we based our sample on the "stylized model of agri-food vertical chain" originally defined by Raynaud et al. (2005:60) which is presented in table 2 below:

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Supplier (e.g. fertiliser)	Farmer	1st Processor (e.g. mills)	2nd Processor (e.g. semi-finished good, end products)	Wholesaler	Retailer

Table 2. Stages of the agri-food chain

Within this model, we mainly focused on processors active in stages 3 and 4. We expected that these SMEs would have a high need to cooperate in innovation processes. *Third*, the accessibility of the company, i.e. the interest of the interviewee to participate in the study, has been crucial for the sample design (Merkens, 2007). The final sample consisted of interviewees from 167 Italian SME (148 small and 19 medium companies). All interviewees were indicated by the SME as a "person responsible for innovation".

4.2. Methods for data gathering and analysis

In our study, we were interested into the perspective of SME innovation managers on collaborative innovation. We particularly wanted to know what they perceive as barriers and enablers to inter-organizational collaboration and learning in innovation networks and gain detailed insights into attributes of network relations in innovation networks involving SME. We therefore decided to conduct semi-standardized interviews (Flick, 2009; p. 156). The basic assumption behind the interview format that combines open, theory-driven and confrontational questions is that the interviewees hold a subjective theory on the topic of the study. This subjective theory consists of explicit knowledge which the interviewee can easily articulate as a response to an open question but also implicit knowledge where he or she needs methodological support in the articulation through other types of questions (Groeben, 1990). Our interview guideline therefore started with open questions on what the interviewee understands as innovation, what the major challenges of his company are in that respect and what he sees as networks. Then, interviewees where asked to describe the most important attributes of network relations in order to identified trigger and opportunities for collaboration and learning in innovation. Here, we added theory-driven sub-questions for being able to fully understand the attributes of the network relationships: If the interviewee did not mention it him- or herself, we asked for the cooperation duration and evolution, particularity, intensity, dependence, and mutuality of the relationship. These questions have been developed according to the theoretical framework proposed by Johnsen and Ford (2000; 2001, 2007) who identified different types of asymmetries as relevant for cooperation in business relationships.

The interviewee was asked both for the benefits and learning points from the cooperation but also for difficulties, conflicts, and barriers to collaboration and knowledge sharing and development. In this case, the questions have been drawn to deepen the firm's capacity, knowledge and relationships attributes as theoretically discussed at the base of learning processes in interaction.

Like this, the interviewee was confronted with the opposite of the own subjective theory regardless whether he or she was in favour or not in favour of cooperation in innovation networks.

Interviews were held via telephone. They took approximately half an hour and were then recoded and transcribed ad verbatim.

Data analysis and interpretation took several steps. We first separated the interview transcripts of small (up to 50 employees) and medium (between 51 and 250 employees) companies because we were interested whether size matters. We then created bodies of text related to the questions, for example all answers related to the question on "From your perspective, what is Innovation.

We then analyzed the question-specific data sets with a bottom-up approach and used techniques suggested by Miles & Huberman (1994). Between two and four researchers coded the material independently, then came together, noted themes and clustered them considering the relations and linkages between each other.

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Table 3 provides an outlook on the typologies we have recourse to in order to analyze above mentioned characteristics of the relationship within the innovation network.

Relationship Characteristic	**Definition**	**Consequences Customer unilaterally influence/ Customer and Supplier bilaterally influence**
Mutuality	Shared goals or common interests of firms.	– Formality/Informality in setting relationship goals – Use/purpose of writtren plans – Extent of interwining of goals and interest and experience
Particularity	Direction and uniqueness of interaction. Extent of standardisation of interaction.	– Standardization/adaptation of approach to interaction – Width of suppliers' customer portfolio – Building of confidence and emotional ties in interaction
Conflict	Differences between the parties over the direction of the relationship or over their respective contributions and benefits	– Conflict resolution efforts involving higher/lower - level actors – Development of approaches for coping with conflict
Cooperation	The extent to which companies work together to determne or implement a direction for the relationship Co-existence of co-operation and conflict	– Experience and inclusion of suppliers in co-operative projects – Development of personal expectations and contributions in interaction
Intensity	Level of contact and resource exchange between firms.	– Range, level and frequency of contact between customer and supplier – Extent of supplier involvement in contact and resource exchange
Power and dependance	Distinct types of power and dependance exist: Technical, Knowledge, Social, Logistic , Administrative.	– Strategic and operational aspects of relationship – Technical aspect of relationship and advisory roles – Decision-making process – Social/networking aspects of supplier's relationships – Development of information and knowledge – Develeopment of values built on history

Table 3. A typology for the analysis of size asymmetry

We analyzed data through a qualitative content analysis that is based on data from narratives and observations that requires understanding and co-operation between the researcher and the participants, such that texts based on interviews (Kondracki et al., 2002). Specifically, we analysed and categorized consequences of each characteristic of the relationship according a pattern of analysis based on abstraction (Graneheim, Lund-

man, 2003) since it emphasises descriptions and interpretations on a higher logical level including the creations of codes, categories and themes on varying levels. Then, we defined three different levels of intensity of the characteristic in the specific relationship: + = low level; ++ = medium level; +++ = high level.

5. Findings

The findings below describe how and in what types of networks SMEs cooperate for developing innovation and what the interviewees identified as barriers and enables to inter-organizational collaboration and learning in innovation network.

5.1. The collaborative innovation of SMES

The understanding of innovation is different for interviewees from small and medium companies within the two data settings. When asked what they perceive as innovation, interviewees from medium companies often mentioned the development of new technologies for the improvement of production processes and technologies. The small firms instead associated process and technological innovation with the incremental improvement of existing products and processes. Generally they talked about product innovation as the improvement of existing products and the extension of the product range. All firms not or least associated the development of completely new products (See Table 4).

	Small	Medium
Development of completely new products		+
Innovative appearances at the market	+	++
New production processes and technologies	++	+++
Incremental improvement of existing product/processes	++	++
New packaging solution	+	++

Table 4. What the firms understood as innovation

However, we observed a difference in the attributes of relationships depending on the size of companies. Table 5 provides a brief overview of these attributes. The general network of relationships comprises clients, suppliers, research centres, and other stakeholders. But looking specifically at innovation network it is understood by the large part of the interviewees

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as cooperation between processing companies and suppliers of raw material, equipment and services. Respect to the theoretical framework we adopted, in this table we didn't consider explicitly the attribute "conflict" since we investigated it through the variable "mutuality". However, although we didn't asked clearly about conflict, we will discuss it due to lateral information. The relationship with suppliers, especially with raw material and equipment suppliers looks very high cooperative to small companies are the suppliers were seen very often as source of innovation or as co-innovator partner. Suppliers act as development and implementation partners for new ideas; in some cases we even find common projects for developing innovations like new packaging solutions and new products. Suppliers also support small companies in designing and tailoring new production and logistic technology solutions for sustainable processes. Relationships to suppliers are characterized as long lasting, affordable and personal. In addition, small clients and experts or specialists are mentioned by small firm as important and strategic cooperative partners in some specific situation. In general collaborations judged to be important are those with specialized clients or firms that punctually provide services. Mentioned are market research companies or firms that have a high investment in R&D and don't want manufacturing or commercialize their new products or semi-finished goods by themselves. Interviewees from small companies reported least on universities and research centers and consumer collaboration. The cooperation with research centers is usually aimed at solving technical problems and has been described as project based with clear cooperation agreements.

Interviewees from medium companies defined network mainly as cooperation with suppliers of equipment and raw material and large distributors. According their view, a network is a strong cooperation within the supply chain, based on technology and market content, allowing to face competition and to guarantee the survival on the market. Suppliers are seen as important and they enable the medium companies to get access to update technology and complementary knowledge. The development of a win-win relationship is very important for the interviewees. Relationships with suppliers aret hus in most cases very stable (longer than ten years) and characterized by trust and reliability. Also relationships with large distributors have been recognized as very important to complement firm knowledge and demand a high management attention and regular contact. Particularly it is described as profiting when strategies are aligned, involve pear cooperation and partners can make reciprocal business deals. In that case, the company gains a profit because it can use the network of clients, take up new ideas, ask their clients to test the products with the end customer and in best case deliver products in exclusivity.

Only few companies named marketing agencies and consumers as important partners for the development of innovation.

Generally horizontal cooperation for innovation within the same branch is not so frequent within small and medium companies. Cooperation with competitors to reach common goals or to develop the whole branch for the profit is mentioned as generally scarce and without any effect when it comes to innovation or to a fruitful knowledge exchange.

	Cooperation		Particularity		Intensity		Power and Dependence		Mutuality	
	Small	Medium	Small	Medium	Small	Medium	Small	Medium	Small	Medium
Small clients	+++	+	+++		+++	++	++		+++	
Large distributors	++	+++	++		+	++	+++		++	
Suppliers	+++*		++		+++	++	++	+	+++	
Universities/ research	+	++	+++		++	+++	+		+++	
Competitors	+	+	+		+		+		+++	++
Federal Agencies	+	++	++	+	++	+	+	+++	+++	++
Specialists and experts	+++	++	++	+	++	+	+		+++	

+ = low level

++ = medium level

+++ = high level

* very high

Table 5. Attributes of Smes Network

Regarding the particularity and evolution, interviewees reported that relationships develop and evolve over time built on increasing tied and personalised relationships. However, the particularity of the relationships of processing SMEs is described as high with small clients and research institute. With suppliers the particularity is a guarantee for the innovation since the benefit of innovation depends on the application and on the novelty of the equipment, especially for small companies. Processing SMEs however have innovation relationships with more than one supplier, so that from their side, the relationship with suppliers is less exclusive than the other way round. Relationships with large distributors are very often not particular; here, the mainly the bigger processing SMEs are usually just one innovation partners amongst many others for the distributers and often based on negotiated affair: technical know how is exchanged for marketing, knowledge on market trends for access to other markets, lower costs for product tests.

Asked about the intensity of the relationship, almost all interviewees mentioned the continuity and the frequency of exchange of information and knowledge with the main partners. Particularly, interviewees from small companies mentioned intensity mainly as team working and continuous knowledge and information sharing together with conjoint job training. Evidence shows the same dynamic in the intensity of relationship with the main partners also for medium companies. We however also find that the bigger the processing SME, the more

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intense cooperation with large distributors and the less intense cooperation with small clients, suppliers and Federal agencies are.

With respect to power dependence, only three few companies declared that the power is balanced and that there are no asymmetries in resources and power between the parts involved in the relationship. In tendency we find that the bigger the processing company, the more dependent are suppliers, and the less dependent is the company from large distributors. In addition, with the size of the company, its dependence from Federal agencies increases.

Mutuality of the relationships is generally mentioned at high level respect to all partners. Mainly small firms indicated as important to create a win-win situation that enables the (incremental) development of "new" products, services, production technologies and raw materials, and to solve common problems.

5.2. Benefits and difficulties in collaborative innovation

The reasons that companies provided on why cooperation for innovation is important include: 1) acquisition of know how on the market and trends, 2) the external view that helps to overcome blind spots, 3)the opportunity to enter new markets and to build up a market reputation, and 4) the possibility to join resources for radical new ideas.

Asked to medium firm for the benefits of cooperation in innovation networks, most interviewees mentioned the development of new products, new services, new production technologies and raw material. Very often, the interviewees mentioned that cooperation creates a win-win situation where they receive complementary know-how and information from each other, exchange concepts, solve together common problems without having to re-invent the wheel or get access to new markets. In some cases, interviewees stated that cooperation enables them to build up a completely new supply chain with producers of raw material in a developing country what makes the production and the products more sustainable innovation. Some medium firms additionally mentioned the opportunity to extend the firm's vision of network and to contribute to fostering the firm's influence on other relationships and partner's collaboration commitments. For the interviewees from small firms, especially the market effectiveness has been emphasized as important benefit during the interview, i.e. how the innovation allows them to improve the quality of their offering in a way that their products better fit the changing market requests.

Discussing on enablers and barriers of collaboration similar results emerged among small and medium firm. Cooperation, generally, has been reported ended due to missing reciprocity of efforts, changing interests or strategies of network partners or problems with the quality of the products. Small firms detailed this aspects in the missed promise of the partner or if he strives only for own benefit, the new product has now success on the market or can not be developed or the partners do not get along well. Rarely, cooperation ends because a contract ends and partners have new plans. Rarely, cooperation ends because a contract ends and partners has new plans. Small interviewees mentioned that cooperation with large distributers is difficult because of the small market power of their own company. For medium firms the challenges they faced are related to finding enough time for cooperation and clarifying

expectations. A barrier to cooperation is also the necessity to confidentiality of new ideas. Some interviewees underlined that the number of partners involved into an innovation project should not be too big because otherwise, the process is too slow.

Looking at the difficulties, more than half of the interviewees declared that collaboration is not always easy. More into detail, some interviewees mentioned the difficulty to share information in real time; others referred to procedural and routine problems arising from the interaction between organizations with different process rules. Technological and technical difficulties have been mentioned mainly with reference to supply chain and R&D relationships where a larger distance has been perceived with respect to knowledge and experience background of partners. One interviewee well elicited this issue indicating that it is difficult (though not impossible) to work with specialized suppliers because of their different views on time, technology and ways of working. Similarly, to work with universities or R&D agencies needs the parties to get first used to each other. Within the perception of the most of interviewees these aspects represents the major challenge of collaboration for innovation. It has been widely outlined by the interviewees that the firms really innovate if they are able to conduct and participate in exploratory activity outside of their organizational boundaries absorbing novel practices from external. In addition, a difficulty other interviewees referred to is the lack of a shared vision with the partners and missing clarity in communication and the definition of goals and expectations.

When asked to expand on the reasons of such difficulties, a majority of respondents referred to the presence of cultural, organizational and resource-related barriers. Particularly trust issues, distances (geographical, dimensional, technological and commercial) between firms and strategic competences exchange increases the risk perceived by the interviewees to integrate into and participate in innovation networks.

The lack of trust and benefits understanding have also mentioned as the main reason of the failure and interruption of long standing collaborations. Furthermore, the i) imbalanced power between cooperating parties, ii) insufficient resources and highest changes required, iii) quality problems or iiii) better alternatives have been found as reasons to break up business relationships. Finally, to avoid dependency from other firms is also mentioned; as well as the time and money investment to innovate within a network was seen as unprofitable in certain circumstances. In addition it is also remarkable that more than the half of firms who disclaims problem or conflicts in collaboration are mainly the smaller ones. Surprisingly, there is a strong tendency among these managers to regard relationships in some general way as a "good thing" and there is also a common belief that all partners work towards closer and mutual relations.

A general agreement among all interviews regarded the belief that the cooperation for innovation needs openness as well as transparency on interests and on the own contribution. The partners should operate at the same eye-level and respect each other, develop together something new while building upon existing knowledge and both benefit from the cooperation. Both should be ready to invest time and efforts into cooperation. Long lasting, personal relationships and trust has been said to be essential for cooperation. Transparency and openness, collegiality and a good gut feeling have been seen by all interviewees as essential for cooperation at the same eye level and to avoid conflicts.

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Again, the trust issue has been mentioned as a key driver of networking orientation of SMEs with the distinctive feature that trust is perceived to be built gradually through the continuity of cooperation among partners. A deep understanding of shared risks as well as of mutual benefits of all network partners have been identified as trigger to the openness of firms and to team working allowing to focus on common goals amongst all network members. Personal and face to face daily contacts - often within existing long standing relationships –have been seen as the preferred way to collaborate and to solve conflicts.

5.3. Barriers and enabler to inter-organisational learning

Discussing on barrier and enabler to inter-organisational learning the main finding which is noticeable is that about all firms (there is only two exception,one for each market) declared that innovation partnerships allow them to increase their competence and knowledge assets. First of all the complementary nature of knowledge and competence predominates innovation relationships. Acquisition and upgrading of technical and technological competences have been seen as the main results of learning collaboration by about the half of investigated firms. Interviewees from the other half of firms declared that their company mainly benefits from the development of market capability and subsequent increases of the market perception of firm offerings' value.

To improve the ability to learn is also mentioned as core element of innovation relationships by about two thirds of respondents. The interviewees stated that collaborating in innovation networks allows them to i) better define what they want and what is expected by partners, ii) develop a clearer vision of their relationships, iii) gain better insights on external knowledge through understanding its meaning for the own organization. As main inter-organizational learning results medium companies valued the better understanding of causes and consequences of their actions that allows for the detection and correction of errors. Some interviewees stressed the unlearning issue as an open approach to innovation. Innovation in networks is mentioned to promote the company to proactively question its older routines, assertions and beliefs and fostering the need of dismissing or replacing outdated knowledge.

Among those interviewees who confirmed the learning results of innovation network relationships, only a minor part identified some barriers or obstacles to their learning processes. The latter have been mainly identified as cultural and power distances between partners or low commitment of partners too. These difficulties have been often seen in relation to the different business and value chain position of partners. In addition, some interviewees stated to be not aware of competences and activities of their partners and this obviously leads to an inadequate understanding and knowledge of the competences available in the network. A common language is required to reduce the distance between partners and to reinforce social and cognitive dimension.

At the opposite site, the complementarities of the partners' knowledge have been seen as the main stimulus to the learning processes. Cultural issues instead feed a contrasting debate: whereas some interviewees named cultural barriers as critical obstacles, others perceived them as a trigger allowing a different view on problem solving issues. When supported by personal and social ties, the different culture of partners has been seen as great opportunity for a more

effective knowledge integration allowing the firm to increase flexibility and therefore its ability to seize strategic opportunities.

6. Discussion and conclusion

The works aimed to advance the state of the art in research on network innovation in SMEs by developing a deep understanding of barriers and enablers to cooperation and learning. In particular, the work aimed at identifying networking attitudes, preferences and practices of food processing SMEs that are relevant to the innovation development in Italian food sector.

The main conclusions from our study are that food SMEs are orientated to collaborate with partners for innovation. Cooperation in innovation networks seems to be important to them – as long as it brings mutual benefits and partners cooperate at the same eye level. However, the innovation openness is focused on some privileged relationships with few partners often belonged to the current network of SMEs where long lasting relationship lleviates trust concerns. Like this, the results highlight the importance of trust in innovation relationships. The processes of developing collaborative innovation is little formalized and based on personal in nature and daily relationships.

We also find that size matters. We identified some differences between the partners of the collaborative relationship for innovation depending on small companies and medium companies in our sample. Small companies seems to work closer with small clients similar to their background of knowledge and routine. Medium companies are used to cooperate with universities and research institutions and like this gain access to very specific technological know-how. The stronger cooperation with the research world explains a wider opening towards the development of new knowledge and indicates that medium companies frame innovation in a long term vision. We didn't notice the same tendency for small food processing SME. This evidence highlights a critical point for Italian small companies, the difficulty to access some kinds of relationship which are not finalized to a specific project but to a wider cooperation of knowledge and development.

For all SMEs in our sample, suppliers are the most important partners with whom innovation cooperation is developed; while a strong innovation dependence characterizes the value chain relationships involving unbalanced partners. Mainly little 1st processing SME are usually more dependent on the bigger 2st processing for innovation whereas the latter are more dependent from large distributers. Like this, dependence of partners in network innovation along the agri-food supply chain always also includes effects of moving costs for innovation development down to the weakest partner. However, even in such a situation the involvement in the innovation network is of mutual benefit for both partners as the larger partner offers marketing and technological input for the improve of products. Surprisingly for small companies the matter of unbalanced power has not been mentioned as critical. The reason might be that they usually operate in a niche and grow together with small clients and suppliers in partnership.

At the basis of innovation collaborations the results highlight the research of resource and knowledge complementarities (Lampela and Kärkäinen 2009). The learn by doing approach

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of Smes to innovation (Holmlund, Kock, 1996) has been proved by our results and extended to networking and learning orientation of the Smes. Cognitive and relational benefits consist of knowledge developed through "on the job" interaction: by solving together common problems Smes improve their processes without having to re-invent the wheel and partners advance their knowledge about potentiality of Smes and needs of upgrading their involvement and interactions. In addition the results show the considerable benefits from the reference effect of the relationships (Ritter and Gemünden, 2004). For the more knowledgeable Smes the interaction for innovation allows the access in a wider network of connected relationships and to better position themselves in value networks.

In sum, the resource and power asymmetries seem to be perceived as a trigger for network and learning interaction. This suggests that the matter of asymmetries seem to be none the most critical to innovation and learning network relationships. A general view is that innovation partnerships tend to perceived to offer a lot also to the less powerful partners mainly in terms of learning and knowledge issue.

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