Global spaces for local entrepreneurship

Stretching clusters through networks and international trade fairs

Marcela Ramírez-Pasillas

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To my family

This thesis includes a cover and the following five papers appended in full:

Paper I

Johannisson, B., Ramírez-Pasillas, M. and Karlsson, G. (2002) The institutional embeddedness of inter-firm networks: a leverage for business creation, *Entrepreneurship & Regional Development*, **14**: 297–316.

Paper II

Johannisson, B., Ramírez-Pasillas, M. and Karlsson, G. (2002) Theoretical and methodological challenges: bridging firm strategies and contextual networking, *International Journal of Entrepreneurship and Innovation*, **3**: 165–174.

Paper III

Ramírez-Pasillas, M. (2007) International trade fairs as amplifiers of proximity in clusters, submitted to an international journal.

Paper IV

Ramírez-Pasillas, M. (2007) Revisiting knowledge cross-fertilisation and clusters by means of international trade fairs, submitted to an international journal.

Paper V

Ramírez-Pasillas, M. (2007) International trade fairs as alternative geographies of knowledge, submitted to an international journal.

Abstract

Ramírez-Pasillas, Marcela (2007). Global spaces for local entrepreneurship. Stretching clusters through networks and international trade fairs. Acta Wexionensia No. 129/2007. ISSN: 1404-4307, ISBN: 978-91-7636-577-9. Written in English.

Many of the insightful writings on clusters identify the role of entrepreneurs as key agents in the formation of firms and clusters. This thesis argues instead that local entrepreneurship is not ceased once firms and clusters are established; local entrepreneurship is about the continuous (re)creation of both businesses and clusters in global spaces. Global spaces for local entrepreneurship emphasises how firms collectively become an agent of continuous renewal. Firms enact an organising context materialising in networks that stretch relations and collaborations according to the issues being dealt with. These networks are localised but are extended beyond the geographical boundaries of clusters. One important example of this, which is in focus in this doctoral thesis, is that firms operating in clusters often interact with actors whom they have met at international trade fairs (ITFs). ITFs are those attractive events that individuals, firms and institutions attend temporarily to exhibit and trade products in foreign and national markets.

This thesis is based on the work contained in a cover and five papers. Each paper contributes to the research objective and questions brought forward in the thesis cover. The empirical evidence has been mostly drawn from several case studies conducted in the Lammhult cluster in Sweden. The findings show that firms build their organising contexts in order to stretch the reach and accessibility to local and non-local actors; they jointly co-create potential opportunities. The organising contexts are mapped in networks using three proximity orders. The empirical findings report three types of situations in which there is a potential opportunity for continuous renewal. By emphasising the opportunities that can be originated when a business is not realised or when a new or improved product or process has not been generated yet, this thesis aims to stimulate a theoretical reappraisal of global spaces for local entrepreneurship. With the conceptual development of global spaces for local entrepreneurship, we put forward the idea that such spaces enhance an ability to renew firms and clusters. The underlying reason is that local entrepreneurship is centered on the social interaction between individuals, firms and/or institutions; it materialises in intended and unintended dialogical situations when there is a commitment to the continuous renewal of firms and clusters. Such dialogical situations carry with them an opportunity for co-creating new businesses, new products and new processes.

Lammhult
in Northern Europe

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Mexico City, autumn 2007

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1. Problem statement

This section introduces the research problem, objective and questions, as well as the outline of the thesis.

1.1 Putting the searchlight on clusters

In this thesis the focus is on clusters, a phenomenon that has been matched with economic growth, entrepreneurship and innovation. International actors such as the Organisation for Economic Co-operation and Development, the United Nations Industrial Development Organisation, the World Bank and the Inter-American Bank of Development have incorporated clusters into their areas of support for promoting research and development around the world. Clusters are here conceptualised as geographical concentrations of social and economic activities operating in the same, related and non-related industries.[1] As research object, clusters have been a most fashionable phenomenon studied the last decades, i.e. within entrepreneurship, strategy management, economic geography, sociology, public policy and industrial organisation (Marshall 1920, Becattini 1988, Camagni 1991, Krugman 1991, Porter 1990a, b, Maskell and Malmberg 1999, Johannisson 2000, Garofoli 2002). Examples of this include the clusters in Silicon Valley in the western US, Emilia-Romagna in northern Italy, Baden-Württemberg, in southwest Germany, Gnosjö in Sweden, Sinos Valley in Brazil and Leon and Guadalajara in Mexico.[2]

[1] This conceptualisation differs and overlaps with other definitions adopted in the literature to inquire into similar socio-economic phenomena, such as industrial districts, industrial clusters, localised production systems, milieux, etc. (for other definitions see Marshall 1920, Becattini 1988, Camagni 1991, Humprey and Schmitz 1996, Porter 1990a, b, Belussi and Pilotti 2002, Garofoli 2002, Scott 2002, Giuliani and Bell 2005). Clusters include horizontal and vertical networks of relations like the traditional definitions of clusters. According to Maskell (2001), the horizontal relations of a cluster include the interaction, co-operation and competition between firms producing similar goods. The vertical relations of a cluster correspond to the interactions, co-operation and competition between firms in networks of suppliers or customers. Clusters here also rely upon lateral networks of relations between and within members of non-related industries (Johannisson *et al.* 2002a). This cluster conceptualisation will be elaborated extensively in section 3.

[2] After the seminal work of Alfred Marshall (1920), several studies have been undertaken in particular over the past 30 years proposing their own alternative expression of clusters such as: Marshallian industrial districts (Becattini 1988, Belussi and Pilotti 2002), industrial clusters (Porter 1990a, b, 1998), localised learning (Maskell and Malmberg 1999), production systems (Garofoli 2002), innovative milieux (Camagni 1991) and clusters in developing countries (Humphrey and Schmitz 2002, Giuliani and Bell 2005).

Many of the insightful writings on clusters identify the role of the individual business as an agent of change in the development of clusters, discussing how entrepreneurs interact with others in order to shape their local environment (e.g. Johannisson 1984, Porter 1994, 1998a, b, 2000, Boschma 1999, DeMartino *et al.* 2006, Waxell and Malmberg 2007). This role usually takes the perspective of the individual during his/her act of creation of the own firm and the formation of clusters (Feldman *et al.* 2005). This role can also be attributed to the perspective of the firm's restructuration activities in response to globalisation processes and technological innovations. This restructuration in turn generates the reconfiguration of clusters (Teubal and Andersen 2000). Yet, while the roles of the individual entrepreneur and the restructuration of the firm are important, this research ignores the role of local collective entrepreneurship in creating the conditions and resources necessary for the continuous renewal of firms and clusters.

Local entrepreneurship is not concluded once firms and clusters are created; local entrepreneurship is also about the continuous (re)creation of both businesses and clusters. Firms in their process of furthering the individual interests and vision also act collectively when co-creating an environment to accomplish such an image. This perspective is different to the ones mentioned above, because it assumes that local entrepreneurship is a collective phenomenon (Johannisson 2003). This means that the (re)creation of firms and clusters is based on the very social interaction between a set of actors, but such interaction originates in individuals' imagination, mutual trust, organisation variability, flexibility and practice. This ensures the potential creation of business activities as well as innovative products and processes. This idea is not new. As early as 1992 Gartner *et al.* presented entrepreneurship as an enactment process, indicating that entrepreneurship is primarily a socially interactive phenomenon. What is new is the emphasis on 'global spaces for local entrepreneurship', the collective (re)creation of a collaborative environment, i.e. an 'organising context' formed by entrepreneurs to sustain their firms and clusters (Johannisson 1988, Johannisson 2003). The organising context is anchored in clusters but can expand far beyond their geographical boundaries.

Clusters, furthermore, are not the outcome of predictable linear processes; they rely on self-organising entrepreneurs, who in turn rely on support from their local environment (Feldman *et al.* 2005). Although agreeing with this, a different approach is taken to the concept of 'environment'. The environment is not experienced as something objective and external to or existing independently of a firm; cf. Teubal and Andersen 2000. In this approach firms must adapt, coalign with, control or be controlled by the perceived environment (Smircich and Stubbart 1985). Instead, firms, clusters and the environment are here reciprocally co-created through social interaction, the environment thus being something enacted (Weick 1979). 'Social

interaction' refers to the social character of what individuals do when they work or have fun (Wenger 1998, Amin and Cohendet 2004). Thus, by means of their social interaction firms co-create their own organising context and thereby their own development conditions (Johannisson 2000). The organising context materialises in networks. By enacting an organising context, firms act to generate opportunities from the collective organising efforts, while of course others, too, can rely and draw on their networks. In the collaborative environment there are no threats or opportunities 'out there' to be discovered (Kirzner 1979); the firms are not alert to a new product or a novel production process and step in to fill in the market gap before others. Firms instead jointly co-create the same opportunities as the ones they exploit.

The conceptualisation of global spaces for local entrepreneurship draws from the literature on complexity theory (Dandridge and Johannisson 1996), which emphasises how firms collectively become an agent of continuous renewal. Firms enact a collaborative environment through learning and acquiring external knowledge (Cohen and Levinthal 1990) and by stretching their local relations and collaborations in their networks according to the issues being dealt with. These networks are furthermore loosely coupled (Weick 1979, Orton and Weick 1990) and extended beyond the geographical boundaries of a cluster. One important example of this, which will be in focus in this doctoral thesis, is that firms operating in clusters often interact with actors whom they have met at international trade fairs (ITFs). ITFs are those attractive events that individuals, firms and institutions attend temporarily to exhibit and trade products in foreign and national markets (Palumbo *et al.* 1998).[3] ITFs appear as one important mechanism for stretching networks as well as for linking and creating global spaces for promoting entrepreneurship (Donckels and Lambrecht 1995). At ITFs firms instigate relations with distant customers and suppliers, thereby inter-connecting their networks (Tanner 2002, Weller 2007). Thus, ITFs could be approached as a means against lock-in (Grabher 1993), and they consequently push local renewal processes (Maskell *et al.* 2006). In these processes firms can act collaboratively and revitalise their clusters by creating a potential for business creation and innovative products and processes.

[3] In this study institutions correspond to organisations that support local activities without making profits. Some examples are producer associations, unions, chambers of commerce, research centres, educational institutions and government agencies. Institutions also include local organisations such as church groups, rotary clubs, and sports clubs.

1.2 Research objective and research question

This thesis aims at elaborating theoretically upon and providing empirical evidence of what we here term *global spaces for local entrepreneurship*. Global spaces for local entrepreneurship mean that firms jointly co-create a collaborative environment, i.e. an 'organising context', to foster the continuous renewal of their organisations and clusters. The organising context is a notion proposed by Johannisson (1988). Although Johannisson (2000) proposes different demarcations of the organising context – territorially, functionally or virtually – our adaptation of the concept is specific. We argue that the organising context in a globalised world has to combine local and non-local relations and/or forces into clusters. The persistent use of an organising context, furthermore, reinforces the clusters by bringing in non-local contacts and knowledge of fashion trends, novel technologies and new business practices to be linked into the networks. Thus, the framework developed here and the empirical evidence provided aim to stimulate a theoretical reappraisal of the local entrepreneurship created by such organising contexts. This thesis thus examines how clusters employ the organising context in order to stretch their networks. This work, furthermore, specifically addresses the role of ITFs in the formation and maintenance of such organising contexts. Thus, the research questions raised are:

- How do clusters stretch their networks in order to ensure local entrepreneurship?

- What role does the interaction between networks and international trade fairs play for promoting local entrepreneurship in clusters?

The above questions are both theoretical and empirical. They are theoretical since they are investigated by developing a conceptual framework and combining theories in five papers. They are empirical since four out of the five papers provide evidence of the Lammhult Swedish cluster to sustain the propositions in the conceptual framework. One paper furthermore employs examples drawn from the literature.

These research questions are partly answered in this cover, partly in the five appended papers of the thesis. Here we have condensed our original points of departure and the generic lessons from the theoretical and empirical work reported in the sections that follow.

The kind of contributions each of the papers specifically makes to the proposed two research questions will be further elaborated in sections 4 and 5 of this thesis cover.

Besides the technical limitations associated with the reported empirical work, the major delimitation of this research enquiry is that the empirical basis is restricted to Lammhult, a rural furniture cluster and its bridges to local and global markets. This bridging, however, focuses on investigations into how this cluster and its member firms employ ITFs to expand their local setting into a global space.

1.3 Outline of this thesis

Section one has provided an overview of the thesis and is followed by section two containing a literature review, which positions this work theoretically. The review also identifies the gaps in the literature and clarifies how this study contributes to our understanding. Section two is organised in three parts. The first subsection introduces clusters and identifies its main features. The second subsection reports different ways to investigate networks across disciplines. The third subsection presents the concept of communities of practice, which is of central importance for this thesis. These literature review subsections are used to identify the gaps in the literature and discuss how this thesis contributes to a lacking understanding of local entrepreneurship. Section three introduces the conceptual framework of this thesis. This framework is presented in two steps; the first step is the development of every notion associated to global spaces for local entrepreneurship. The second step elaborates on the theoretical propositions that are used to guide the empirical work contained in this thesis. Section four introduces the methodological choices from research strategy to research design. This section also includes summaries of the methods of data collection, data analysis and quality criteria for every paper. Section five presents summaries of the five papers. Finally, section six discusses the conclusions of this thesis and states how this work calls for future research. It also revisits the concept of global spaces for local entrepreneurship.

2. The firm as embedded in multiple overlapping systems

There is a variety of concepts explaining and understanding how a firm generates and reinforces its local entrepreneurship by means of its embeddedness in a collective. Following a systemic approach, clusters, networks and communities of practice (CoPs) are briefly presented in the coming sections.

2.1 Clusters

'Clusters' form a well-established concept to describe geographical concentrations of specialised firms, products and innovation activities in the fields of economic geography, entrepreneurship, evolutionary economics, industrial economics and sociology (Marshall 1920, Becattini 1988, Camagni 1991, Krugman 1991, Porter 1998a, b, Maskell and Malmberg 1999, Johannisson 2000, Garofoli 2002). Clusters have become a key mode of economic coordination and a spotlight of government policies across the world (Cook and Huggins 2004). Porter (1990a) originally coined the concept of clusters by drawing from industrial economics theory. For Porter (1990a) the localisation of firms in clusters is crucial to their competitiveness. Clusters offer firms support by setting and stimulating the pace of innovation and the formation of new firms. The reason why clusters exist and why firms are innovative in their activities lies according to Porter in four attributes of a nation. These attributes are:

1) Factor conditions. These factors correspond to the nation's position in terms of production. These include skilled labour or the infrastructure necessary to compete in a given industry.
2) Demand conditions. The nature and size of home-market demand for the industry's products or services.
3) Related and supporting industries. The presence or absence in the nation of suppliers in related and non-related industries. The suppliers must also be internationally competitive.
4) Firm strategy, structure and rivalry. These correspond to the conditions in the nation determining how companies are created, organised and managed. This also includes the existence of domestic competition.

According to Porter (1990a, b), these attributes are inter-related and their interaction creates the national environment in which firms are started, developed and compete. In turn, the local business environment helps firms develop their ventures, albeit influenced by the national environment. This model is known as Porter's diamond (see Figure 1). This environment is external to firms and clusters; thus the firms' strategy must 'align' the organisations to the environment (Johannisson *et al*. 2002b).

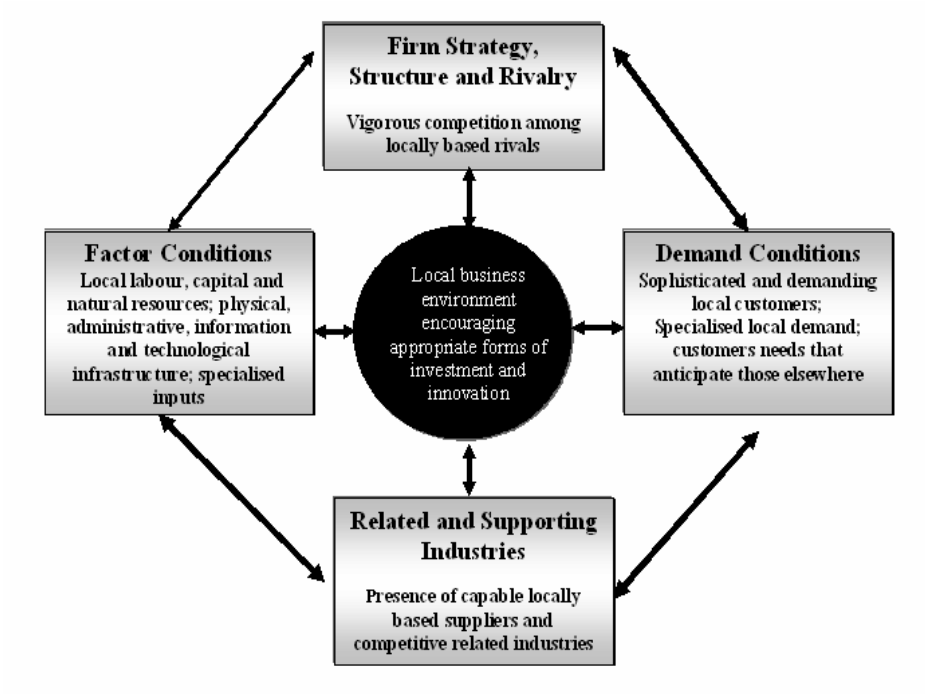

Figure 1. Porter's Diamond

Source: Martin and Sunley (2003:8, Figure 1)

Numerous studies have been undertaken over the past 30 years paralleling Porter's definition, in particular after the rediscovery of the Marshallian industrial districts by Giacomo Becattini in the Northern Italy in the late 1970s.[4] A variety of works have proposed their own alternative definition of the phenomenon, making comparisons almost impossible due to their unique features, i.e. Marshallian industrial districts (Becattini 1988, Markusen 1996), industrial clusters (Porter 1990a, b), innovative milieux (Camagni 1991), industrial networks (Håkansson 1987) and localised production

[4] Marshall (1920) refers to industrial districts. In this thesis industrial districts are approached as a type of cluster.

systems (Belussi and Pilotti 2002, Garofoli 2002), to name but a few.[5] The concept of clusters was further elaborated in later studies, making comparisons even more complex (e.g. Porter 1994, 1998a, b, 2000, Humphrey and Schmitz 1996, Malmberg *et al.* 1996, Cook and Huggins 2004). Despite these differences there is general agreement in this vast body of literature that the *five main features* of localised clusters are:

1) a concentration of socio-economic activities operating in one or few related industries;
2) such activities being vertically and horizontally inter-linked and changing continuously;
3) individuals, firms and institutions in the clusters being acquainted with each other;
4) one or several firms, associations or public agencies playing the role of a hub-organisation providing common services and representing firms in dialogue with external stakeholders, such as the government; and
5) firms, institutions and clusters enacting some kind of individual and/or collective entrepreneurship and innovativeness.

The first feature corresponds to the concentration of socio-economic activities operating in one or few related industries. This feature has its origin in the localisation of firms forming clusters in a particular place, this localisation generally occurring in two ways:

1) the decentralisation of the production of a large firm in a place regardless of whether the firm is internal or external to the area, or,
2) the concentration of a system of firms within a place for historical, cultural, geographical or economical reasons.

The second proposition, in particular, goes back to Marshall (1920) and his work on industrial districts. Marshall (1920) identified four reasons for the emergence and development of clusters. These four reasons are referred to as external economies in his book *Principles of Economy*, these economies being external to the firm but internal to the cluster. *First*, the concentration of a number of firms specialised in an industry in a cluster triggers the availability of specialised workers benefiting the local firms. *Second*, such concentration of firms allows the existence of a variety of advanced

[5] There are other types of clusters that are not addressed in this thesis. This includes: Hub-and-spoke districts and industrial complexes (Markusen 1996). Hub-and-spoke districts are dominated by one or several large firms. In these clusters there is a tendency to serve non-local markets and there are no trade local associations. Industrial complexes are dominated by one or several government institutions. There is a low commitment to local suppliers and there are no specialised associations (Gordon and McCann 2000).

machinery, standardised and specialised inputs. The increased availability of inputs together with competition in quality, service and price fosters their continuous improvement. *Third*, Marshall (1920) identifies that the information flows occurring between individuals carry specialised technical knowledge of the industry at hand. *Fourth*, he states that external economies improve market access.

The second feature of clusters is that activities are vertically and horizontally inter-linked and that these links are changing continuously. Horizontal relations refer to linkages between two or more local firms occupying the same or a similar position along the value chain in an industry (Maskell och Malmberg 2006). This can include joint marketing of products, joint purchase of inputs, order-sharing, common use of specialised equipment, joint product development and exchange of know-how and market information. Vertical relations correspond to exchanges along the value chain including buyer-suppler relations (Porter 1998a, Maskell 2001). They also cover relations to local firms via institutions. This includes interaction, relations and collaboration in business associations, business development centres, public agencies and local clubs.

The second feature is anchored in the institutional endowments and flexible specialisation orientation of clusters. These are developed from the historical and cultural traditions enabling and shaping socio-economic exchanges among firms in clusters. Becattini (1988) identifies the high degree of vertical division of labour and the institutional endowments holding together the networks of small firms. Maskell and Malmberg (1999) describe the institutional endowments as all the rules, habits, customs, moral beliefs and political values and the entrepreneurial spirit associated with the provision of capital, land and labour. Altogether, the institutional endowments and the geographical proximity facilitate face-to-face encounters permitting the circulation of technical language and know-how, thereby encouraging the creation of knowledge (e.g. Gustafsson 2004).

In relation to the flexible specialisation orientation, Piore and Sabel (1984) identify the flexible specialisation characterising the productive activities in clusters. Firms divide the production stages in a manufacturing process within a group of collaborative firms generating their specialisation in particular tasks. Firms co-operate and compete with each other while developing complementary activities. These firms hire manpower according to their market demands and focus on customised products in short series at competitive prices (Brusco 1992). Brusco states, for example, that subcontracted individuals (i.e. artisans) and firms receive their orders from the more successful competitors. As a result they are forced to shift between the production models, the production of various components and the assembling lines from one competitor to the other. Labour exchange and

mobility thus contribute to the local circulation of ideas and know-how (Marshall 1920, Krugman 1991).

The third feature of clusters is that individuals, firms and institutions in clusters are aware of and acquainted with their members. This is anchored in the local business climate of clusters. Through the geographical proximity, the institutional endowments and the flexible specialisation orientation clusters develop a local business climate (Johannisson 1984), or, as stated by Marshall 1920, a special atmosphere. The business climate is created out of the social embeddedness of the economic activity (Granovetter 1985). This highlights the extent to which social relationships and networks of such relationships affect the economic activities, behaviour and relationships of individuals and organisations (Granovetter 1985, 1992). Social embeddedness means that there is an overlap between private and public (business) concerns in the individuals' everyday life. Engagement in industry-specific associations or social clubs becomes habitual activities. This results in regular, yet casual, interactions leading to conversations on the industry/job domain. Such casual interactions contribute to the development of a shared identity and shared experiences as well as good will with respect to supporting others. This enforces mutual trust and learning (Visser and Boschma 2004).

The fourth feature of clusters is that one or several firms, associations or public agencies play the role of a hub-organisation providing common services and representing firms before the government. Hub-organisations can co-ordinate the collective activities and provide an array of services for affiliated firms (Gertler and Rutherford 1996). These hub-organisations in turn rely on the cluster for realising their ventures; they can employ relations and collaborations for learning, organising resources and realising opportunities. These relations and collaborations thus influence the hub-organisations inasmuch as they influence them. Hub-organisations appear as either firms (Bellandi 2001), government agencies or non-profit organisations (Schmitz 1999b, Garofoli 2002). Hub-firms co-ordinate the production and distribution activities of a group of small firms (Lorenzonni and Baden-Fuller 1998) and also share resources and information about products and processes (Carbonara 2002). Government agencies and non-profit organisations foster arenas for collective action and offer a platform for spontaneous meetings (Pyke 1992, Bennett 1998a, b). These hub-organisations help shaping a shared identity and a collective vision for the cluster (Cook and Huggins 2004). Their central role allows them to detect needs, co-ordinate services and plan collective activities relevant to the overall cluster. Their central position makes it also possible for the hub-organisations to misuse their information and resources to control firms and institutions in the cluster.

The fifth feature refers to the individual and collective entrepreneurship and innovation of clusters. There is much evidence that clusters foster entrepreneurship and innovation in Europe, cf. Piore and Sabel l984, Pyke 1992, including the Scandinavian countries; cf. Johannisson *et al*. 1994, Maskell and Malmberg 1999. A paradoxical fact is that increasing globalisation enhances local interactions, relations and collaboration, reflecting the genuinely collective entrepreneurial and innovative capacity of clusters; cf. DeMartino *et al.* 2006. This means that the relations, interactions and collaborations between firms and institutions are beneficial for the firms and clusters. Entrepreneurship and innovation are triggered because of the geographical proximity between individuals, firms and institutions (Maskell and Malmberg 1999, Camagni 1991). Geographical proximity, in particular, induces knowledge exchange enhancing collective learning processes (Keeble *et al.* 1999, Visser and Boschma 2004, Cook and Huggins 2004). These processes lead to novel specifications and responses in products, processes or organisations, which fosters ongoing creation activities and enhances business activities. This ultimately guarantees the survival of clusters. Yet, when relations and collaborations are dominantly local, there is a risk of developing strong relations, which can create a cognitive lock-in and redundant information (Burt 1992, Grabher 1993, Grandori and Soda 1995). This can affect innovation and cause firms and clusters to decline (Boschma 2005).

To sum up; clusters constitute a prominent notion within research and business practices and it is here to stay. While much can be said about the five features of clusters, there are two important issues to reflect upon. *First*, researchers traditionally have taken an objective approach to clusters perceived environment. This means that the members of the clusters are those individuals, firms and institutions located within their geographical borders. Yet, the use of combined spatial scales and created business climate suggest that clusters cannot be reduced to what is contained inside those borders. The borders are not closed; individuals, firms and institutions do not limit their interaction, relations and collaborations to local members. An approach to borders that includes the 'permeating' of individuals, firms and clusters to or from clusters still needs to be conceptually elaborated. The s*econd issue* is that vibrant business climates create a reputation for themselves that makes others wanting to be linked with the cluster networks. A collaborative environment thereby invites local and non-local interactions with networks for the continuous renewal of firms and clusters. Thus, networks are discussed in the next section.

2.2 Networks

Networks represent structures between people, firms and institutions, conveying information, business exchanges and innovation activities.

Networks shift the focus from atomistic individual explanations of a phenomenon (i.e. attributes of independent individuals, firms or institutions) to relationships among systems of interdependent individuals, firms or institutions (Parkhe *et al.* 2006). Viewed in this way '[p]eople and organizations are not the source of action so much as they are the vehicles for structurally induced action' (Burt 1992:5). Networks can thus be conceptualised as impersonal, calculative, organisational arrangements (Powell *et al.* 1996, 2005), and they can be viewed as personal arrangements or a combination of them (Johannisson *et al.* 1994). The reason for this is that personal relations can transcend firm boundaries, becoming stronger and more elastic than their firm counterparts (Gordon and McCann 2000). Personal relations include rational calculation, shared values and mutual sentiments supporting the reasons for exchange. Yet, networks may mean different things and thus a rich cross-disciplinary literature accompanies the notion (Pickernell *et al.* 2007).

Network theory is developed from anthropology, sociology and psychology and has been recognised for over 60 years (Scott 1991).[6] Recent decades have witnessed an explosion of research into networks in fields such as entrepreneurship, geography, management, marketing and sociology, which has led to the emergence of a range of views of networks. There are four recognised networks views: (1) networks as metaphors (Johannisson and Monsted 1997), (2) networks as relational dynamics (Wallenklint 2001), (3) networks as research approaches (Nohiria and Eccles 1992) and (4) networks as analytical tools (Wasserman and Faust 1994). These views are discussed in the following subsections.

2.2.1 The networks as metaphors

The networks as metaphors have a 'bridging function between social and economic dimensions of human conduct, between different disciplines and methodologies, between the academic community and the world of practice' (Johannisson and Monstead 1997: 109). Alfred Marshall coins the metaphor of 'industrial atmosphere' created by networks featuring industrial districts as characterised by economies of specialisation, information and labour supply, all embedded in networks (Pyke and Sengenberger 1992). Thus the traditional models of the large, vertically integrated firm of the 1960s, and of the small autonomous, single-production-phase firm of the 1970s and part of the 1980s are replaced by networks of firms and institutions (Capello 1996).

[6] Radcliffe-Brown was the first anthropologist to study the social relationships between two people. This author refers to social relationships as 'social structures' (Scott 1991: 4). The study of social relationships evolved from 'social structure' to social networks, 'SOCNET' (Scott 1991).

This network metaphor suggests that the collaboration between firms and institutions seems to be the appropriate manner to study clusters.

The literature addresses the networks between firms and institutions, including buyer–supplier relationships, university interaction and relations between competitors; cf. Saxenian 1991, Belussi and Arcangeli 1998, Sturgeon 2002. It is important to note that while these networks differ between clusters, they are by no means mutually exclusive. Researchers have specifically addressed networks of dyadic relations in order to be able to understand or explain clusters from a systemic perspective. While this is done in a fairly creative manner, certain research is supported by complex operationalisation of relations; cf. Paniccia 2002. Nevertheless, networks as metaphor has been useful for understanding how entrepreneurship, innovation and regional development are fostered through interrelations within networks rather than through the actions of individual firms or institutions.

2.2.2 The networks as relational dynamics

The networks as relational dynamics emphasises the development of networks over time. In the 1990s there was an emergence of studies inquiring into networks development. Butler and Hansen (1991) examine the development process of wine entrepreneurs' networks among 78 wineries in North America. These authors describe how entrepreneurs change their relations from being merely social to also include business and strategic issues. Unfortunately, the specific regions in which the wineries are located is an aspect ignored by the study. Larson and Starr (1993) develop a theoretical model explaining the transformation of single-dimensional dyadic exchanges into a network of stable and multilayered relations between firms. The model details three stages of entrepreneurial networking activity which are used to secure the critical economic and non-economic resources needed to start a firm. Confirming the dynamics predicted by Larson and Starr (1993), Johannisson (1996) conducts a longitudinal study in which the networks of nascent and existing entrepreneurs are examined at the beginning and end of a 6-year period. The study shows that business relations develop into personal relations by the end of the period.

Sydow (1996) studies the development of an inter-firm network in the financial sector in Baden-Württemberg. The network members transform their firms by developing new services over two years. The firms build up trust in one another, allowing them to set up a common inter-organisational information system. Wallenklint (2001) studies the development trajectories of three small firm networks in Skellefteå, Sweden. The author shows that the three networks have evolved along different trajectories. Some networks change into more formalised structures, which posed problems requiring

managerial and structural solutions. These networks emerge out of long evolutionary processes in which the actors have sought to maximise capacity and competencies for their firms. Wallenklint's study, however, neglects considering the particulars of the regions in which the networks are located. Blundel (2002) follows the growth trajectory of two cheese producers' networks in Britain. He illustrates that entrepreneurs who coordinate their networks influence the developmental pattern and behaviour of the networks. This author shows that the entrepreneurs who recognise the importance of networking activities consciously maintain and develop their networks over time.

Powell *et al.* (2005) study the developing of networks of (formal) partnerships in the Boston biotechnology industry in the US over a period of five years. These authors provide the largest and most methodologically advanced network study in this research domain. A main interpretation of their study is that that those firms frequently rely on non-local partnerships to acquire external knowledge. The authors also confirm that actors change their partnerships over time in order to be able to create new products.

Unfortunately, largely because of the difficulties of gathering data on networks and their respective relations over time, the view of networks as relational dynamics still constitutes a challenge. Researchers agree that networks structures vary over time, but there is much left to be done in order to understand the conditions and features that endure networks trajectories and guarantee the survival of networks over time.

2.2.3 The networks as research approaches

The networks as research approaches imply that networks are adopted as a theoretical framework. The research approach is flexible, being applicable to different kinds of actors, relations and mechanisms fostering networks, as well as to different types of networks (Grandori and Soda 1995). Based on a review of the empirical literature, Contractor *et al.* (2006) consider nine families of theories and mechanisms that are used to explain the creation, maintenance, dissolution and construction of networks. These are (1) theories of self-interest, (2) theories of mutual interest and collective action, (3) cognitive theories, (4) cognitive consistency theories, (5) contagion theories, (6) exchange and dependency theories, (7) homophily theories, (8) proximity theories and (9) theories of evolution and co-evolution. The theories and related mechanisms are summarised in appendix 1.

Table 1. Selected network theories and their theoretical mechanisms

Theories	Theoretical mechanisms
Self-interest theories	*Individual value maximisation*
Social capital	Investments in opportunities
Structural holes	Control of information flow
Structural holes	Control of information flow
Collective action theories	*Joint value maximisation*
Public good	Inducements to contribute
Critical mass	People with resources and interests
Cognitive theories	*Cognitive mechanisms leading to*
Semantic/knowledge networks	Shared interpretations/expertise
Cognitive social structures	Similarity in perceptual structures
Cognitive consistency theories	*Choices based on consistency*
Balance	Drive to avoid and restore balance
Cognitive dissonance	Drive to reduce dissonance
Contagion theories	*Exposure to contact leading to*
Social learning	Imitation, modeling
Institutional	Mimetic behaviour
Structural theory of action	Similar positions in structure
Exchange and dependence theories	*Exchange of valued resources*
Resource dependence	Inequality of exchange
Network exchange	Complex calculi for balance
Homophily theories	*Choices based on similarity*
Social comparison	Choose comparable others
Social identity	Choise based on group identity
Proximity theories	*Choices based on proximity*
Geographical proximity	Influence of closeness
Electronic proximity	Influence of accessibility
Network evolution and co-evolution theories	*Variation, selection, retention*
Organisational ecology	Competition for scarce resources
Complex adaptive systems	*Network density and complexity*

Source: Elaborated from Contractor *et al.* (2006:683, table 1)

Research has also found that networks vary considerably depending on their settings, applicable collaboration agreements, networking activities and contemporary local/global developments (Johannisson 2000). Some researchers study 'entrepreneurial networks' (Donckels and Lambrecht 1995), which refer to how entrepreneurs create a support-relational structure to realise their new firms; cf. also Johannisson 2000. Other researchers investigate 'small-firm networks' (Wallenklint 2001), which refers to the organisation of economic activities through inter-firm co-operation (Grandori and Soda 1995). Others again investigate firms' relationships with other large, medium and small firms (Borch and Arthur 1995), where such inter-firm networks are defined as 'strategic networks'; cf. also Gulati *et al.* 2000. There are researchers who examine 'production networks' (Sturgeon 2002), the organisation of production in groups of small, medium and large firms around the world. Some study 'regional networks' or groups of firms and

institutions that create joint support services for businesses (Sydow 1996, Ramírez-Pasillas 2004). Still, it was Håkansson (1987) who identified the four basic elements that are important in a functional network organisation, i.e. actors, activities, resources and relations. For Håkansson, a firm uses different resources to perform certain activities by means of relations to other organisations, and these relations connect the firms in a network structure. The relations in the network can form means for acquiring knowledge or for creating stability and realising innovations.

Finally, some research matches clusters and networks in order to study the interactions, relations and collaboration in 'cluster networks' c.f. Johannisson *et al.* 1994, Giuliani and Bell 2005, Giuliani 2007. Cluster networks are of particular relevance in this thesis. Johannisson (1987a), Becattini (1988), Pyke and Sengenberger (1992) and Garofoli (1995) introduced networks as a feature of clusters. In cluster networks firms and institutions are linked at the technical-productive-service level and limited to a particular geographical area (Johannisson and Monsted 1997). The networks members tend to favour geographical proximity for promoting entrepreneurial processes; yet it is not a necessary condition for the emergence of cluster networks; cf. Giuliani 2007.

There are *four* key features of networks important for the continuous renewal of firms and clusters. The *first* is that individuals, firms and institutions are willing to embark on risky relations and collaborations without fearing opportunism, guaranteeing collective benefits. The *second* is that individuals, firms and institutions can rearrange their relations and collaborations without fear of reprisals. This grants a flexibility to networks, as it is normal to change partners. The *third* is that firms are not only willing to act as a support for realising individual visions but also for obtaining mutual benefits and goals. The strength of these relations and collaborations is based on the social embeddedness featuring the networks. The *fourth* is that cluster networks exist to provide information, solve common problems, meet common needs and exploit opportunities (Johannisson 2000). In contrast can a too high emphasis on the social embeddedness (Granovetter 1985, 1992) between the cluster network affiliates create cognitive lock-in (Grabher 1993) and information redundancy (Burt 1992). Both cognitive lock-in and information redundancy affect the innovation activities of local firms, confirming geographical closure of some kind (Boschma 2005).

2.2.4 The networks as analytical tools

The use of networks as analytical tools has it roots in sociology and anthropology, i.e. in sociometric methods, evolved to be known as social networks analysis techniques (SOCNET) (Scott 1991). As analytical tools the networks are approached as abstract notions referring to a set of nodes –

individuals, firms and institutions – and their connecting relations (Grandori and Soda 1995). Networks as structures can be said to offer an 'incomplete' picture of reality, since it is usually difficult to distinguish and include all members of networks. Nevertheless, SOCNET presents several methods for examining networks. The most common structural features for defining networks include size, types of strands, reciprocity, the strength of the strands, and multiplexity (see Table 2).

Table 2. Common structural features of networks

Feature	Definition
Size	Number of relations between the nodes in a network
Strand	Type of relation, i.e. social, personal, business, problem-solving
Reciprocity	Extent to which a strand is confirmed by both parties. This is also addressed as symmetry
Strength	Intensity of a strand as indicated by the node in terms of time, or Likert-scale, number of times employed
Multiplexity	A network or a relation that is characterised by multiple strands in a single relation serving different purposes, i.e. being friends and doing business
Indirect strands	Path between two actors mediated by one or more others
Isolated node	A node with no strands in a network

The structural features of networks are, however, influenced by the operational choices of researchers, such as types of strands and the strength of the strands; cf. Johannisson *et al.* 1994. These features have proved useful for identifying sources of competitive advantage in inter-firm networks by indicating that density influences firm performance and outcomes; cf. Human and Provan 1997, Rowley *et al.* 2000. Yet, one of the most common limitations of SOCNET is that researchers find it quite challenging to define and operationalise the relevant content of networks activities and include them accordingly**.**

Researchers have also characterised varying degrees of access to contacts and resources by addressing network features and measures. SOCNET suggests a variety of measures to uncover patterns and structures within the networks. The commonly used measures include density, number of components and network centrality (see table 3) (Wasserman and Faust, 1994).

Table 3. Common measures of networks

Measure	Definition
Density	The proportion of reciprocated relations that are realised with respect to the total possible number, ND = n(n-1)/2, n being the number of nodes in a network
Components	Largest connected sub-groups of network nodes and strands.
Centrality	Extent to which a node is central in a network. There are various measures to estimate centrality, i.e. degree, closeness and betweenness

The density of networks is useful to determine how well-connected networks are; cf. McEvily and Zaheer 1999, Rowley *et al.* 2000. The denser the networks of contacts are, the less likely that new ideas, resources and contacts will be taken in and the more likely that networks will be resistant to changes. The component measure indicates the number of sub-groups in networks (i.e. sub-graph). The members of a component can communicate with one another, either directly or indirectly through intermediaries. These components are important for identifying sub-groups within networks which have a specific function, i.e. creating technical knowledge; cf. Giuliani and Bell 2005. Centrality includes the ability to access and/or control relations and resources through indirect as well as direct links (Wasserman and Faust, 1994). Centrality can, furthermore, be estimated in different ways depending on the issues in focus. A centrality measure can inquire into the ability of actors to 'reach' other actors in their networks through intermediaries; cf. Powell *et al.* 1996. It can also tap an actor's prestige, specialisation and absorptive capacity that are enhanced because of central positions in networks; cf. Burt 1992, Giuliani and Bell 2005, Giuliani 2007.

There are *two* important limitations when using networks as an analytical tool to address clusters. The *first* is that the mathematical and methodological groundings of SOCNET can be quite technically advanced, which makes it less accessible to social scientists. It includes graph theory and statistical analysis (Scott 1991). According to Parkhe *et al.* (2006), the mathematical treatment of relational data is thus available only to a minority. The *second* limitation is that the operationalisation of cluster networks tends to freeze structures in time. Thus, there is a need for operationalisations capturing the dynamics occurring within those structures, i.e. how their relationships and their contents change over time. Yet, SOCNET allows researchers to get one step ahead in cluster inquiry. Researchers can employ advanced modelling to examine cluster networks and provide empirical evidence to conceptual frameworks. However, there is still a need for accessible network modelling supplemented with rich empirical evidence.

One alternative concept that is relevant for addressing the continuous venturing of firms and clusters is communities of practice (CoPs). CoPs have been developed by different researchers and thus an array of expressions exists in the literature. The different expressions of this concept will be generally defined as CoPs. This concept puts the emphasis on the notions of 'social interaction' and 'joint enterprise' occurring between the community members and non-members. Both of these notions are significant for our conceptualisation of global spaces for local entrepreneurship and therefore they are reviewed in the following subsection.

2.3 Communities of practice

While the concept of community has been a cornerstone in sociology for nearly two centuries, as represented by the works of Tönnies, Durkheim and Marx (Lindkvist 2005), the emergence of the notions of CoPs changes our perception of the meanings embedded in the realisation of a job or an activity in clusters and/or networks. There are a variety of CoPs, which will be discussed here. As Håkanson (2004) states, concentrations of such communities favour the entrepreneurial formation and development of firms in clusters. Thus, these notions are relevant for local entrepreneurship.

Epistemic community (EpCo) is the first expression addressing communities; it is introduced by Knorr-Cetina in 1981 (Knorr-Cetina 1999). EpCos constitute groups of people with recognised expertise and competence in the particular domain of science (Knorr-Cetina 1999). EpCos are shaped by similarity, necessity and historical coincidence. Knorr-Cetina (1999) uses the examples of one community in high energy physics and another in molecular biology. The process of constructing meaning out of everyday work determines how and what people know. Thus, the enactment of knowledge, object relations and social relations is the outcome of complex processes. These processes are embedded in oral communication, note-taking and reflection. Håkanson (2004) extends EpCo to clusters in order to elaborate on the creation of knowledge from the pursuit of common practice. This knowledge, he states, can be accessed, exploited and shared between EpCos. To Håkanson, when individuals decide to create a firm, they share an understanding gained by working for other firms in the same or related industries. They thus share knowledge embedded in practice.

Lave and Wenger (1991) originally propose the notion of CoPs and it is further elaborated by Wenger (1998, 2000), Brown and Duguid (1998) among others. CoPs are particularly relevant to the topics of individual and organisational learning, knowledge management and education. As it is initially proposed in Lave and Wenger's theory of 'situated learning' (1991), CoPs are defined as the creation of a group sharing the practice of a

profession. Learning occurs by understanding how to behave and what to do in a certain profession in the social situation in which it occurs. The notion of CoPs emphasises the social interaction triggering the individual and collective learning processes of a profession; these processes are similar to an apprenticeship but their emphasis is on learning. There is a division between the existing members of the community, the masters and their disciples, and the newcomers, the apprentices. The apprentices are thus the new learners. CoPs emphasise the social interaction materialising in continuous engagement in situ and the identity-forming process occurring in the learning of a profession. This learning process is addressed as 'legitimate peripheral participation' (p. 31), which indicates that learning occurs because it is an integral part of the world we live in (Lave and Wenger 1991). Thus learning is of a social nature, taking place in social interaction. Learning happens first at the boundaries of a practice by observation. Then the apprentice gradually becomes accepted and can exercise the practice partially or fully in the community. Lave and Wenger (1991) use examples such as butchery, midwives, tailoring and non-drinking alcoholics. These communities help the individual to fit in over time.

Brown and Duguid (1998) take the notion of CoPs into the intra-organisational setting (Cox 2005). These authors emphasise that CoPs are key means for solving problems and acquiring new understandings in order to 'get the job done'. CoPs are loosely coupled, allowing a more flexible application of the notion of community. They can be improvised according to the issues dealt with. This is relevant because the pre-established managerial ways often fail. Thus, entrepreneurial processes can take place in order to get the job done. This, however, requires the development of local understanding, which is achieved by oral communication and narrative-sharing. This process results in novel solutions to problems, rather than the reproduction of existing knowledge. The authors use the example of Julian Orr's ethnographic studies of photocopier repairmen, who service machines at Xerox, in his book *Talking about Machines: an Ethnography of a Modern Job'*. Entrepreneurial processes are drawn from the photocopier repairmen's loosely coupled networks and are used for solving problems and getting the job done. Nevertheless, some authors consider that Brown and Duguid (1998) present a simplified and romanticised picture of a harmonious collaborative group based on shared meanings (Cox 2005). Yet, what is important in Brown and Duguid's work is the emphasis placed on loosely coupled networks that are flexible enough to establish contact with others according to need. This creates the possibility of building common understandings in order to create bridges between knowledge bases while fostering entrepreneurial processes across places.

Wenger (1998, 2000) later develops the notion of CoPs further. He proposes that a group sharing joint enterprise, mutual engagement and perspective on

the world and producing practice constitutes a CoP. This community is addressed as tightly knit around what people do together and is usually co-located in the workplace. This notion further includes the processes of creating social identity and multi-membership, which arises from participation in different communities. The CoPs socially construct identity and meanings, which are central in learning. There are four main features of CoPs according to Wenger (1998):

1) Joint enterprise results from a process of collective negotiation and creating mutual accountability;
2) mutual engagement materialises in sustained relationships, which can be harmonious or conflictual;
3) shared repertories of beliefs, symbols and artefacts are needed for pursuing a joint enterprise; and
4) CoPs can have fully-participating members, newcomers and non-participants, i.e. being in the periphery, being in the margin and being full-non-participants.

Joint enterprise is particularly relevant for clusters. Applied at clusters, this notion means that when individuals, firms and institutions belong to a CoP, they have a joint enterprise, whereby the relations and collaborations between individuals, firms and institutions bring along: (1) the knowing of what others know, (2) the knowing of what they can do together, and (3) the knowing of how they can contribute to collective innovation. CoPs thus permit the rapid propagation of new or jointly created ideas as well as knowledge; participants know who belongs and who can be trusted. This does not necessarily mean that the actors in clusters recognise themselves as a community. The practice and the sharing of ideas and knowledge as well as the acceptance of support and styles are what matters. While Wenger (1998) uses examples of the practice of claim-processing in a single organisation, CoPs are here of central importance to clusters. The notion of CoPs associated to clusters is related to everyday social interaction, mutual engagement and joint enterprise while carrying on with a job. This also includes the everyday tensions necessary for getting the job done, which ultimately shape the practice.

Henry and Pinch (2000) further develop the notion of CoPs as knowledge communities to address clusters. Knowledge communities are ‘groups of people in separate organisations but united by common norms, values and understanding, which shape the knowledge creation trajectories of the industry to which they belong’ (p.127). Henry and Pinch (2000) employ the example of the circulation of knowledge between organisations in the motor sport valley by means of the employees’ mobility, the emergence of new firms and overlapping criss-cross networks of suppliers; cf. Marshall’s notion of industrial district (1920). Rumours, gossip, shared discourses and ways of

doing things, in particular, help disseminate certain aspects of design and technical knowledge (Henry and Pinch 2000, Pinch *et al.* 2003). However, Wenger (1998, 2000) does not consider that such CoPs can exist between individuals of different firms and institutions. Thus, there are two further concepts relevant to our purpose, 'constellations of interconnected practices' and 'trans-national communities'.

Wenger (1998) notices that certain communities are too broad and too diverse to be qualified as CoPs; he thus suggests the notion of constellations of interconnected practices (p.126). A 'constellation of interconnected practices refers to a broader configuration than a single community of practice' (Wenger 1998: 127). This notion contains many CoPs features such as historical roots, having a related or joint enterprise, proximity of interaction, styles of discourse, related activities, similar conditions, challenges faced, sharing artefacts and competing for resources. While Wenger provides a number of examples ranging from a city to social movements, companies and the global economy, he is not clear if this concept can be applied to communities of organisations. The constellations are understood in terms of social interaction between and within practice, which involves crossing community boundaries. This permits the further 'borrowing', 'copying' and 'improvement' of practice. As people import, adapt, adopt and reinterpret ways of behaving, elements of the discourse travel across places and are recombined and rearticulated somewhere else (Wenger 1998).

In agreement with this, Amin and Cohendet (2004) state that firms employing relations and collaborations across places can create communities. This is relevant because it helps understanding how entrepreneurial processes are triggered between places. Coe and Bunnell (2003), influenced by the notion of 'constellations of interconnected practices', elaborate on the notion of 'trans-national communities'. These authors propose that international innovation networks become trans-national communities over time. Such communities share highly skilled workers and encourage temporary residence across countries. Coe and Bunnell (2003) use three examples of trans-national communities. The first concerns communities created by trans-national companies, which foster the mobility of experts across the world for performing temporary jobs and/or projects. The second example corresponds to the social networks built by immigrants to keep in touch with their home countries. The third example constitutes the knowledge communities gathered by the key travelling of business gurus, civil servants and journalists. Their participation in seminars, congresses, meetings, videos and published material also fosters the birth of communities around specialised issues.

There are several issues in this overall literature review worth reflection. Clusters, networks and CoPs are conceptualisations that share the problem of establishing their precise composition and their boundaries. These conceptualisations include some individuals, firms and institutions and exclude others. The interaction with what is outside their borders is approached with caution while what is inside is perceived as obvious. A lack of interaction and relations with outsiders can create a 'lock-in', hindering the firms' ability to adapt to change and speeding up processes of decline. Thus, there are important reasons for incorporating certain flexibility when dealing with boundaries. The concept of CoPs, focusing in the social interaction and joint enterprise between those individuals, firms and institutions that are in the periphery and those that are not, is as we see it the most suitable notions in order to create a conceptual opening for encouraging the continuous renewal of firms and clusters. The emphasis on the continuous renewal of firms and clusters implies focusing in the social interaction and joint enterprise that build bridges between local and non-local actors and forces. This is, however, not clear in the conceptualisations of clusters and it has created varied interpretations, confusions and tensions across disciplines. Thus, we next turn to elaborate upon a proposed conceptual framework based on these considerations in the next section.

3. Conceptual framework: Global spaces for local entrepreneurship

Given the difficulties of establishing a more relaxed approach to the boundaries and composition of a cluster, the aim presented in the thesis is to build a theory that helps us understand how firms shape an organising context for producing continuous (re)creation of their organisations, balancing the local and non-local contacts and/or forces. A theory of global spaces for local entrepreneurship is proposed, in which different notions are associated to the concepts in the following subsections: 'global spaces as organising contexts' (3.1), 'the multi-faceted construction of organising contexts in clusters' (3.2), and 'local entrepreneurship as a collective phenomenon' (3.3). These notions are then articulated by means of alternative proximities (3.4).

3.1 Global spaces as organising contexts

'Global spaces' are not unlimited spatial spheres; they are matched in this thesis with organising contexts. The notion of the organising contexts takes its point of departure in the collective enactment of a collaborative environment where firms jointly co-create their own development conditions by offering geographical openness and promoting entrepreneurship in clusters. This co-creation of development conditions means that firms jointly enhance their social and business activities, influencing one another in order to prompt entrepreneurial processes for the potential shaping of businesses, products and/or processes. The organising contexts accentuate the role a cluster has as support for the enactment of firms. This process does not end, however, once a firm has been initiated; the continuous (re)creation of a firm guarantees its survival. Thus, the organising contexts offer a support according to which firms follow a certain logic; i.e. the rationale by which the generic challenge to bridge the local and global settings is arrived at (Johannisson 1994). The organising contexts define how individual firms realise their ventures while also influencing the overall cluster activities. The organising contexts offer firms an instrument for coping with ambiguity, either by easing uncertainties or by assisting in turning unforeseen changes on the markets into opportunities. The organising contexts have three features, according to Johannisson (1988, 1994, 2000): the enacted

environments, self-organising and fuzzy boundaries. These features are discussed as follows:

The enacted environments

The organising contexts are enacted shared environments (Weick 1979), which materialise in networks. These networks function as 'loosely coupled systems' (Weick 1976, Orton and Weick 1990), which means that their nodes – individual firms and institutions – are interdependent, albeit autonomous. The autonomy implies that individual firms and institutions use the networks for fulfilling their individual needs, obtaining guidance and emotional support, as well as for realising their need for independence (Johannisson *et al.* 1994). Thus the networks are forms of collective interdependent agencies that construct a socio-economic practice. This practice helps firms and institutions to enact their jobs, as it provides an understanding of their situation and innovative potential. This socio-economic practice is in turn shaped by the interactions, relations and collaborations between a variety of local and non-local actors and forces. In networks the interactions, relations and collaborations are important for realising individual firms' purposes for which substitutes elsewhere are not available. The networks constitute an enacted environment for mutual engagement and shared enterprise anchored in a local and global interplay. As the member firms interact and co-operate in their networks, they gain the overview needed to trade and carry out research and development activities on the basis of the variety of opportunities and resources that are individually and collectively produced.

Self-organising

Networks are assumed to have self-organising properties. Hayek (1973) introduced the concept of 'self-organisation' in the approach to economic complexity. He argues that the economic system consists of heterogeneous individuals with different levels of cognitive ability that cannot be systematically coordinated. He states that self-organisation is a better method for coordinating multiple individual decisions and situations than central planning. He approaches self-organisation as a 'spontaneous' order (Hayek 1973: 36). Within such an order firms can often deliberately organise other actors (Brown and Duguid 1998). It is individual firms that make decisions while pulling resources and actors from their organising contexts. Yet, the deliberate self-organising of firms and institutions exhibits collective patterns, emerging as individual and firms adjusting to and provoking changes in their environment with their actions. This means that when any member of the networks identifies a need for change, the change disseminates throughout the networks. When, for instance, external knowledge in fashion is acquired and absorbed by one firm, this knowledge is subsequently translated and

disseminated to the rest of the members in the networks (Cohen and Levinthal 1990, Giuliani and Bell 2005). The networks develop new understandings and ways of working which change both the knowledge and the networks. The temporary turbulences caused by the changes in understandings and ways of working are absorbed by some firms while leaving others unaffected. These self-organising features can be achieved either by way of a broad set of weak relations or by strong relations exploiting the variety of commitments that the social embeddedness offers (Granovetter 1973, 1985), the reason being that the organising context favours reciprocity and loyalty.

Fuzzy boundaries

The boundaries of an organising context are kept fuzzy in relation to the enacted environment. Such boundaries vary according to what issues are to be dealt with. This is similar to the CoPs' approach adopted by Brown and Duguid (1998), stating that interactions, collaborations and relations are carried out, influenced and adapted in order to deal with contemporary challenges. The challenges are changing and so are, accordingly, the nature and affiliation of organising contexts. Such interactions, collaborations and relations are also realised as investment in human and social capital for future use or for reciprocating support received earlier on in the careers of the participants. The organising context thus makes room for creating unforeseeable business opportunities, since they are open to randomly created unexpected encounters. The organising context offers a global space, which is invisible but not totally closed to outsiders. It has an ability to be stretched in order to deal with challenges, being secret, even hidden in the very interaction between its loosely coupled members. Yet, a distinction is made between what happens inside and outside the organising context and these happenings are evaluated differently. This does not necessarily indicate that the firms in an organising context think of themselves as an organising context like in CoPs (see Wenger 1998). This means that internal and external relations are assumed to be of a different kind; suppliers and customers are treated differently by the members of the organising context.

When combining self-organising properties and fuzzy boundaries, the resulting logic is a collaborative environment that is simultaneously open and close, indeterminate and rational, spontaneous and deliberate. Neither Johannisson (1988, 1994) nor Orton and Weick (1990) refer specifically to the enacted environment as collaborative. Here this is done for *two reasons. First*, the individuals, firms and institutions are engaged in 'joint enterprises' (Wenger 1998) in their networks. This indicates that these actors are deeply committed to the other's interest and vision as if it were their own. As a result, this reduces the need for control, assessment and coordination.

Second, in an enacted collaborative environment the emphasis is placed on the realisation of innovation-generating relations and collaborations. What is of outmost value in those relations and collaborations is what can be potentially achieved in the future. Figure 1 illustrates the organising context as part of the enacted collaborative environment.

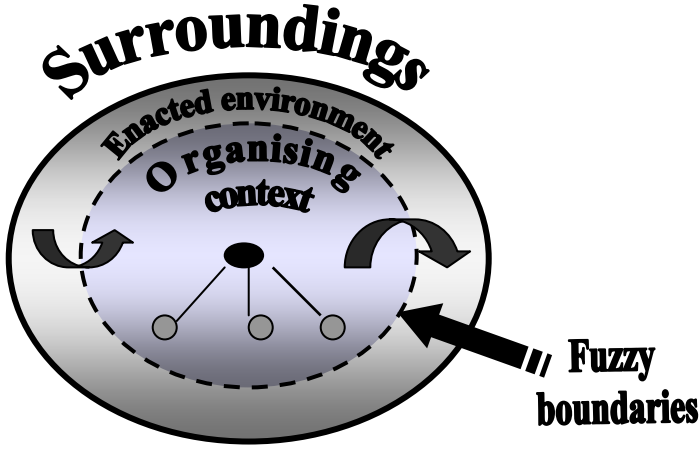

Figure 2. The organising context
Source: Adapted from Johannisson et al. (2002a:299, Figure 1)

This brings us to the discussion of the next feature of global spaces for local entrepreneurship, the multi-faceted construction of the organising context within the conceptual framework here proposed.

3.2 The 'multi-faceted' construction of organising contexts in global spaces

Johanisson (1988, 2000) proposes that the organising contexts can be constructed considering multiple facets – or logics. These facets can be territorial, functional, virtual or a combination of them, according to the situation being dealt with. When the organising contexts follow a territorial facet, it may be characterised by networks in clusters. A functional facet will be restricted to the corporation or the global value chains, whereas a virtual logic will prioritise global network structures. These structures are usually supported by use of ICT for interacting and collaborating via enterprise information systems, Internet portals and/or Intranet environments.

In this thesis, the organising contexts in global spaces accentuate two facets: (1) the role of (localised) clusters as support for organising people and resources (i.e. a territorial facet) and (2) the created playground as a support

for enhancing entrepreneurship in clusters out of the interaction with ITFs (i.e. functional facet). *The first facet* refers to the concrete function of the organising contexts; this function is anchored in clusters. Being anchored in clusters, there is an important symbolic component featuring the interactions, relations and collaborations of individuals, firms and institutions. In clusters, the organising contexts increase understanding of ways of working, dominating styles and accepted norms for the realisation of opportunities. *The second facet* implies that the organising contexts constitute a 'safe' playground for experimentation, development, imitation, and adoption of new ideas, products and processes in clusters. This playground guarantees the dissemination of actions, encouraging the continuous renewal of firms (and also of clusters). This playground thereby provides a basis for bridging localised clusters and global actors.[7] ITFs are here used as an example of a mechanism relevant for bridging clusters and global actors. ITFs stretch cluster network links in order to generate new ideas, products and processes at a local and global interplay (Ling-yee 2006).[8] This means that an organising context combining territorial and functional facets is here addressed, while realising that there are other possible combinations.

In the here chosen combination, the organising contexts take geographically localised clusters as point of departure, thereby the notion of clusters here adopted needs to be revisited. Clusters refer to geographical concentrations where:

1) place-specific conditions are acknowledged;
2) individuals, firms and institutions are interdependent in socio-economic horizontal, vertical and lateral interactions, relations and collaborations;
3) interactions, relations and collaborations not necessarily are restricted to the firms and institutions belonging to the cluster;
4) interactions, relations and collaborations, even if they only take place inside the cluster, are influenced by what happens outside its geographical borders;
5) external arenas such as ITFs might be a mechanism used by cluster members in order to create and sustain their networks in the locality.

This definition of clusters includes: firms, local government, local public agencies, banks, associations and clubs. This comprises the business people and workers reliant on local labour market opportunities and supplies. It also considers external influences in the networks when relying on ITFs. At ITFs firms commonly meet with non-local customers and suppliers (Hansen

[7] Global actors refer here to foreign customers and suppliers.
[8] There are other mechanisms which are not included in this thesis which could be of equal importance; i.e. international congresses, temporary visits to plants, international commercial missions and an increased use of ICT.

2004). Through participation at ITFs, firms develop a more relaxed approach to geographical boundaries in order to build networks with relevant non-local partners. This more relaxed approach to geographical boundaries fosters the continuous creation of opportunities for firms and clusters.

This definition of clusters differs in two distinct ways from traditional definitions (i.e. Marshall 1920, Becattini 1988, Camagni 1991, Humphrey and Schmitz 1996, Porter 1990a, b, 1998a, b, Belussi and Pilotti 2002, Garofoli 2002, Scott 2002, Giuliani and Bell 2005). *First*, clusters are not restricted to the actors in one main industry and supporting related ones. In this cluster definition, the organising context includes those actors relevant for the issues that must be dealt with. *Second*, clusters are shaped by and shape the organising context. Thus, clusters are not restricted to a territorial organising context; they also include a non-local functional facet fostered at ITFs. Thus, the constant establishment of temporary partnerships and relations at ITFs according to individual firms' and shared contextual needs are at hand and their effects disseminate in clusters. This leads us to the next element in our theoretical elaboration of global spaces, the concept of local entrepreneurship.

3.3 Local entrepreneurship as a collective phenomenon

'Local entrepreneurship' is here approached as a collective phenomenon. This means that vision, passion and initiative-taking are not unique features of entrepreneurs but natural features of human beings and can be generated in their social interaction; thereby local entrepreneurship is here associated with the social interaction of human beings. Local entrepreneurship is furthered by individuals in firms and/or institutions materialising in the intended and unintended consequences of dialogical situations when there is a commitment to the continuous renewal of firms and clusters. Such dialogical situations carry with them potential opportunities for (re)creating new businesses, new products and new processes, that is, entrepreneurial processes.

According to Johannisson (2003), entrepreneurship as a collective phenomenon is realised in the social interaction of a set of actors, albeit with different or similar capabilities. Within the social interaction, the individual imagination, variability and flexibility are manifested to carry out a 'joint enterprise' (Wenger 1998). The joint enterprise focuses on organising continuous renewal, which recognises individualistic and collectivistic entrepreneurship, thereby applying to the conception period and throughout the existence of firms and clusters.

Local entrepreneurship means projecting according to opportunity, whereby the (re)creation of the firms and the clusters is supported by the deployment of resources and organising of contacts via the networks. This includes the irrational aspects of the conviviality of doing a job such as 'mutual commitment', 'mutual trust', making the 'personal chemistry fit' and 'having fun' (Johannisson 2003, Wenger 1998). However, it also includes the rational aspects of such conviviality: the 'joint enterprise', the 'calculated choices' and 'mutual benefits' (Sjöstrand 1992, Wenger 1998). All of these aspects are embedded in the dialogical situations which are part of everyday life in the business world. The everyday life of business stimulates unintended or intended dialogical situations. Such dialogical situations are a means for realising knowledge cross-fertilisation, that is, the unintended or intended consequence of dialogue, reflection and observation of others when there is a commitment to ITFs on the part of firms in clusters. Such cross-fertilisation often emerges as an exchange of knowledge and is followed by making sense of such knowledge. This results in multiple forms of interpretation, rearticulation and recombination of knowledge beneficial for creating new businesses, new products and new processes. This is in part a reflection of the fuzziness of the boundaries between private and business lives and between clusters as organising contexts and the collaboratively enacted environment.

There are two reasons for the fuzziness of the boundaries. *First*, intense networking at ITFs is continuously used to create potential businesses or to renew products and processes in clusters. *Second*, the organising context is employed at ITFs according to the issues, needs and challenges at hand in clusters; this generates occasions for creating opportunities individually but also collectively. This indicates that the social interaction between individuals, firms and institutions that are on the periphery of organising contexts and those that are not creates an opportunity for encouraging the continuous renewal of firms and clusters. The social interactions between them amplify individual interests into collective efforts, thereby enhancing both the individual self-confidence and identity and strengthening the legitimacy of the cluster; cf. Reid et al. 2005.

Our concept of local entrepreneurship thus emphasises its collective nature; it redirects attention away from popularly held conceptions of the 'entrepreneur as hero', and towards a more nuanced understanding of how entrepreneurship is shaped by shifting opportunity structures and how particular collaborative processes become enabled through the construction of networks and shared cognitive frames (Lounsbury 1998). Local entrepreneurship focuses on the members of the organising context that jointly create strategic behaviours for acting in the global spaces (Johannisson *et al.* 2002b). Strategy, in this case, results from a series of strategic behaviours within and between competitors, suppliers, customers,

government institutions and private associations (Galaskiewicz and Zahher 1999). These series of strategic behaviours targets the establishing of a potential for continuous creation in established firms. This potential suggests that the firms co-create the conditions for their innovation activities, which materialise in potential opportunities for new businesses, new or improved products and learning processes in the networks concerned.

This approach, furthermore, favours collective entrepreneurship over collective efficiency (Schmitz 1995). The concept of collective efficiency emphasises the combination of Marshallian external economies and the effects of joint actions, which helps to explain the efficiency gains of firms located in clusters and their increased capability to innovate and grow (Schmitz, 1995, 1999a). While external economies are central for achieving the collective efficiency, there is also a deliberate force at work, namely, consciously pursued joint action restricted to vertical and horizontal relations (Rabelloti and Schmitz 1999, Humphrey and Schmitz 2002). Collective entrepreneurship, in contrast, recognises the Marshallian external economies, the deliberate but also spontaneous relations and collaboration. It, furthermore, includes the lateral relations between firms and institutions between and within non-related industries. Within the horizontal, vertical and lateral relations and collaborations, the emphasis is placed on the social interaction which is conducive to the potential creation of opportunities.

To sum up: the organising contexts (manifested in networks) in which collective entrepreneurship is fostered within clusters (and instigated at ITFs) all together constitute 'global spaces for local entrepreneurship'. Within such spaces individuals, firms and institutions often connect with others on wider geographic scales or restrict themselves to clusters by forging networks. Jointly, they create a logic for sustaining their networks at the local-global interplay. This means that networks prioritise the self-organising of territorial scales, making it impossible to separate local, regional, national and global scales. What actually takes place in the cluster may not be local business at all but the manifestation of a wider socio-economic interplay. In the clusters this may involve local actors who have found, beside local partners and friends, either: (1) regional, national and/or global partners to collaborate and trade with, and/or (2) regional, national and/or global partners to express their interests and be friends with. This double-edged possibility is what makes it so interesting to try to locate 'local and non-local socio-economic activities' at the clusters in the first place.

In order to articulate global spaces for local entrepreneurship, the geographical and relational proximities of the socio-economic activities are considered next. This is done in order to map the organising context, created and stretched to renew firms and clusters.

3.4 The articulation of global spaces for local entrepreneurship through the 'embedded' proximity of socio-economic activities

The position here is that firms co-create their organising contexts (manifested in networks) and these are not necessarily restricted to a single place like a cluster. Understanding how the organising contexts creates a meaning of what is close and 'distant' is central for defining who can be a member of the network. For this purpose the notion of proximity is useful, as individuals, firms and institutions no longer define their closeness to someone in terms of geographical proximity but instead employ their relational proximity extending their spatial sphere of interaction to create their organising contexts. Yet, the increased mobilisation of individuals in firms and institutions makes it important to consider the time frame of proximity (i.e. permanent vs. temporary). Torre and Rallet (2005), in particular, recently proposed including the time frame in proximity.[9]

Geographical proximity refers to the co-presence of firms, institutions and people within a certain territorial reach. Geographical proximity is a relative phenomenon; it is weighted by transportation cost and time and is based on individuals' judgment of distance (Torre and Rallet 2005). It comprises the geographical distance to firms of the same and related industries (i.e. specialisation economies), to firms of different industries (i.e. diversification economies) and to associations, universities, research centres and public agencies (e.g. Capello and Faggian 2005, Torre and Rallet 2005). The time frame, in particular, is central in geographical proximity and is frequently materialised by the travelling of individuals and the accessibility to transportation means (Amin and Cohendet 2004). The need of face-to-face contact for deal-making, relationship adjustment, evaluation and socialisation brings people together through travelling (Storper and Venables 2004). Thus, firms benefit from a permanent geographical proximity as long as they operate in a cluster. Permanent geographical proximity facilitates the local dissemination of technological capabilities and know-how (Saxenian 1994, Baptista 2000). In contrast, distant firms participating in joint projects share a temporary geographical proximity for a short period of time when they travel to meet. Working by travelling has become more common among business people (Amin and Cohendet 2004). Thus, when co-presence between distant

[9] Other authors have considered more complex definitions of proximity. Boschma (2005) considers cognitive, geographical, institutional, organisational and social proximities, Oerlemans and Meeus (2005) makes a distinction between spatial and organisational proximities and Torre and Rallet (2005) differentiate between geographical and organised proximities.

actors is needed, visits to offices or ITFs and intense meetings are arranged (Torre and Rallet 2005).

The sharing of permanent or temporary geographical proximity facilitates but does not guarantee that firms interact and co-operate with each other. Collaborations and relations are an outcome of relational proximity. Relational proximity refers to the existence of multi-stranded relations in which the same firms, institutions and individuals are 'embedded' in networks for different purposes (Wasserman and Faust 1994, Johannisson *et al.* 1994, Uzzi 1997). The networks include a mixture of market and embedded relations to secure a relational proximity but also a relational distance between firms. In other words, the 'multiplexity of a relation' stands for the multiple strands that a relation between two actors can show (Wasserman and Faust 1994). It denotes that the ability of building strong or weak relations among firms, organisations and people is recurrent, embracing different strands concurrently, but also changes over time (Weick 1973, Larson 1992, Ring and Van de Ven 1994).

These features are crucial, as they imply that actors can distance themselves from a strand of a relation or a relation that does not contribute at all to the development of a firm or an institution. Yet, an individual working in a firm or an institution can *re-activate* the strand or the relation *when and if* there is an interesting turn in the activities of the actor in question. This means personal networking that is activated spontaneously or when needed (Johannisson *et al.* 1994). Such personal relating indicates that business actors combine social and business concerns in individual relations, thereby producing legitimacy and resources for their firms (Johannisson 2000).

Other literature states that the multiplexity of relations in networks is central for innovation; cf. Håkansson 1987. It is when those strands exist in a relation that the array of possibilities is created, which will be considered accordingly. Others again suggest that the different strands contained in a relation should be separated. Giuliani (2007) has proposed, for instance, the separation between the so-called business network of relations and the knowledge network of relations in a cluster.

The time frame is also central in relational proximity. Firms located in a cluster share a more or less permanent relational proximity through their networks. They invest in building trust and maintaining collaborative linkages to other firms (e.g. Saxenian 1994). Conversely, firms that engage in partnerships share a temporary relational proximity. When two firms launch a partnership, they establish a non-disclosure agreement for a specific period of time (Bathelt *et al.* 2004). When the specific partnership is terminated, social strands have been built between actors in the firms. These strands can be reactivated in future partnerships or via co-operation by e-mail or video

conference over long distances. In sum, relational proximity offers a powerful mechanism of both short and long distance co-ordination within a time-frame dimension that constitutes the foundation of increasing socio-economic interactions and co-operation around the world. By combining geographical and relational proximities firms ensure individual and collective entrepreneurship.

To this purpose the framework developed here consists of three 'orders' of interaction and collaboration, in which global spaces for local entrepreneurship are realised (see table 4 next page). The capacity of co-operating among individuals and firms will in particular be considered here. This framework incorporates the potential creation of businesses, products and processes in clusters as a result of the utilisation of the organising context. In this framework ITFs are included as an illustration of a non-local arena employed for building the organising context and ensuring local entrepreneurship.

Table 4. Proximity in global spaces for local entrepreneurship

Proximity	**First order Intra–cluster**	**Second order (here) ITF**	**Third order Holistic**
Feature	Permanent geographical co-location among firms which are sharing a relational proximity	Temporary geographical co-presence among firms engaging at ITFs which are employing a permanent or temporary relational proximity at such events	Activity linking the first two others in which there is a permanent geographical co-location among firms
Kinds	• Local commercial relations • Local friendship relations • Local partnerships • Local personal networking	• Local partnerships activated at ITFs • Local personal networking utilised at ITFs • New trans-national partnerships found at ITFs • Existing trans-national partnerships encountered at ITFs	• *Multi-stranded relations carrying a potential for creating businesses, products or processes*

The first order, intra-cluster proximity, is the co-existence of a permanent geographical and a permanent relational proximity between individuals and firms.[10] The permanent geographical proximity induces the dissemination of collective learning processes and the development of innovation (Visser and Boschma 2004). A permanent relational proximity in clusters highlights the existence of horizontal, vertical and lateral relations serving innovation purposes. These relations mirror the social embeddedness of economic activities (Granovetter 1985, Johannisson *et al.* 1994, Uzzi 1997). The social embeddedness facilitates the exchange of tacit knowledge in networks of relations, which is more difficult to trade in markets. These relations shift the attention towards an embedded view of action that focuses on how social interaction within particular institutional and historical circumstances enables the emergence of entrepreneurial activity. In Table 4, four relations are considered: *'local commercial relations'*, *'local friendship relations'*, *'local partnerships'* and *'local personal networking'*.

The first one, local commercial relations, address the realisation of business exchanges between cluster partners. This includes lending, borrowing and barter (Johannisson *et al.* 1994). Using Granovetter's (1973) terminology, these single-stranded relations can be addressed as 'weak' ties. Weak ties are important for creating entrepreneurial opportunities; they can bring diversity, contacts and opportunities not yet explored in clusters. The following relations (local friendship relations, local partnerships and local personal networking) are multi-stranded or 'strong', using the terminology of Granovetter (1973). They address the dialogical situations occurring between cluster colleagues in which mutual goals and benefits set the basis for an ongoing social interaction. This is embedded in the everydayness of business life in clusters. Friendship means personal contacts frequently used as a source of information through spontaneous or deliberate dialogical situations. All multi-stranded relations contain certain elements of friendship when a relationship is established. In the professional dimension individuals often enter into a personal relation for instrumental reasons varying from camaraderie and information access to status enhancement. Nevertheless, once individuals initiate a relation, they are likely to build trust, loyalty and commitment (Westphal *et al.* 2006). The first multi-stranded relation, *'local friendship relations'*, stimulates dialogical situations concerning common topics of conversation, i.e. recent problems and the latest advancements and novelties in the firm. Such encounters contain strategic and intentional as well as spontaneous triggers for sustaining the relation, updating on the colleague and spreading certain information in clusters. This can be done unintentionally but it can also be an instrumental means to create opportunities. 'Local partnerships' and 'local personal networking' result

[10] This statement does not mean that local relations last forever, but it does mean that once they are established they tend to last long (e.g. Uzzi, 1997).

from the literature reiterating how entrepreneurship should be considered a product of a network of relations (e.g. Johannisson 2003). The second multi-stranded relation, '*local partnerships'*, indicates a situation where a firm establishes a strategic alliance with another firm in business and collaborations over innovation. Firms engage in calculated local partnerships in cases where supplementary knowledge and skills based on market conditions (and without social embeddedness) are searched for. This approach is largely strategic (Gulati *et al.* 2000). Firms only establish a local partnership when the vulnerability of allying oneself can be held at a tolerable level (Powell *et al.* 1996). Firms turn to partnerships to exchange knowledge, mobilise resources and relate to specialised actors. The third local multi-stranded relation, '*personal networking'* (Johannisson *et al.* 1994), addresses relations sharing business and innovation purposes where social embeddedness is the basis for a relational proximity. Personal networking carries the sense-making guiding the individuals the realisation of his or her firm; it includes the human rationale, emotions and intuition fostering the continuous organising of people and resources (Johannisson 2000). Personal networking contributes to the enactment of a collaborative environment encouraging intended or unintended dialogical situations and habitual entrepreneurship by means of mutual commitment and spontaneity.

The second order is here the ITF proximity; it refers to the dialogical situations occurring between colleagues at ITFs embedded in local and trans-national relations and partnerships.[11] ITFs have become more and more of a fashionable activity, as they combine work and fun. At ITFs firms perform their jobs while enjoying the conviviality of the exhibition, dinners and tourist activities with colleagues, partners and even competitors. This conviviality stimulates the unintended or intended dialogical situations started at ITFs for initiating entrepreneurial processes (i.e. conversations, meetings, seminars, lectures and time for reflection). At ITFs many European booths have their own conference rooms and lounges where contacts are created with the help of snacks, drinks, lectures, seminars and presentations (Tesar 1988). The seminars and lectures arranged by the firms fulfil two purposes: they provide a platform for exchanging information between customers and suppliers and an arena for displaying product information aimed at particular target groups (Ling-yee 2006). In the booths firms also attend the presentation of new or improved products. They participate in product hands-on experience (Seringhaus and Rosson 1994). Firms also discuss product designs, product functions, product improvements and often product failures. These dialogical situations often begin as an exchange of knowledge followed by making sense of such knowledge; it is in this process of knowledge cross-fertilisation that entrepreneurial opportunities can be co-created. There are various occasions for engaging in dialogical situations at

[11] Trans-national relations refer here to non-local foreign linkages.

ITFs; these dialogical situations, however vary depending on the size and strategy of the firm and on the partners that firms plan to meet or happen to get in touch with. In Table 4 four relationships are considered which capture some of the dialogical situations occurring at ITFs: '*local partnerships'*, '*local personal networking'* and '*new trans-national partnerships*' and '*existing trans-national partnerships'*.

The first kind of dialogical situation is triggered by local partnerships activated at ITFs, local partnerships here referring to the existing ones employed at ITFs for the purpose of sharing information on the company's recent activities, products or plans. Encounters between partners often occur spontaneously or planned at dinners, seminars and in the corridors of ITFs (Maskell *et al.* 2006). In such encounters firms reinforce the relation to those partners with whom they have carried out business transactions beforehand (Ling-yee 2006). Partner firms visit each other's booths, observe and talk about each other's novelties, adjust their relation and make future plans for their desired outcomes. *A second kind of dialogical situation* is triggered by local personal networking utilised at ITFs; it addresses those situations in which a meeting is arranged between a local personal contact and a trans-national partner in order to discuss R&D and technology, products, training and marketing activities. This proposition stems from the relational view of knowledge-sharing literature proposing that firms learn not only from their own direct experience, but also from the experience of others (Huber 1991, Dyer and Singh 1998). Short and intense encounters between partners are held to optimise resources and the cost of meetings (Torre and Rallet 2005). At their encounters firms share interpretative schemas and build new understandings for continuing with their business activities. *The third and fourth kinds of dialogical situations* are triggered by new and existing trans-national partnerships. The literature on clusters emphasises the benefits of formal partnerships in marketing, manufacture and R&D. 'Trans-national partnerships' here correspond to proprietary pathways for directed transfers of information and resources that give significant advantages to associates. According to Bathelt *et al.* (2004), when firms find a potential trans-national partner, they decide how much information should be disclosed to the partner and to what extent the activities of the partner will be monitored. However, it is important to consider that building a partnership is a process continuing after ITFs (Rice 1992). For this reason trans-national partnerships are divided into new and existing ones. In both kinds of partnership firms are induced to exchange ideas, get inspiration and form new interpretations through socialisation at ITFs. Through the development of trans-national partnerships firms engage in ongoing dialogical situations. The dialogue involves the sharing of information, joint sense-making and developing relation-specific memories (Selnes and Sallis 2003). These activities constitute the foundation for translating and recombining knowledge, which can be materialised in new or improved products, processes and practices.

The third order, holistic proximity, is an activity linking the two previous orders of proximity at the cluster, identifying those local relationships and local partnerships in which three possibilities occur: (1) those local business relations in which there is a potential for opportunity creation. This specifically addresses those cases in which firms that are disconnected in the business sphere coincide in the local institutions. These encounters create a potential for business opportunities. It also includes (2) those local relations and local partnerships between the firms that actively use their ITF proximity and the firms that do not participate at ITFs. The firms that actively use their ITF proximity comprise those firms that find trans-national partners at the events. It also considers (3) those local relationships and local partnerships in which at least one of the firms introduces product or process innovations after having participated at ITFs. These situations generate a potential for creating opportunities in the other firms, which are not producing new products or processes. Locally, firms converse, observe and reflect upon their business practices, technologies and products, influencing and reinvigorating the individual and collective entrepreneurship of the cluster.

4. Research methodology

This section discusses the methodological choices of this thesis as well as the design of the papers in order to fulfill the research objective and answer the research questions.[12]

4.1 Research philosophy

This thesis takes a positivistic approach to science. A positivistic approach follows a realist epistemology claiming that the world exists independently and innately to people's perceptions of it. Researchers adopting this approach agree that reality is out there waiting to be discovered by the researcher. Both researchers and their objects of study are treated as independent units, so researcher can examine their objects without being influenced by them. Researchers learn about an object by observing its behaviour, which makes the external reality more important than any internal subjective 'reality'.

4.2 Research strategy

Neuman (2000) suggests that positivist research should consider three important dimensions: (1) *the objective of conducting the research*, (2) *the treatment of time* and (3) *the research method applied*. These aspects should guide the research design. Regarding the first dimension, there are three *types of research objective* depending on whether the research is exploring a new phenomenon, describing it or explaining why it happens (Neuman 2000). Studies may have multiple objectives, but one of them is usually dominant. Exploratory research is conducted when a researcher needs to become familiar with a phenomenon. Exploratory researchers usually address 'what' questions and often gather their data qualitatively. Descriptive research, on the other hand, renders the specific details of a phenomenon, situation, process or relationship. Descriptive studies focus on 'how' and 'who' questions, such as 'How did it happen?' and 'Who was involved?'. Explanatory research builds on exploratory and descriptive research, and goes on to identify the causes and reasons why something occurs. Researchers conducting such studies are interested in determining explanations that best enrich a given theory. Table 5 provides examples of various objectives of these three types of research.

[12] This section is elaborated from Ramírez-Pasillas (2004: 34–47).

Table 5. Objectives of research

Exploratory	Descriptive	Explanatory
• becoming familiar with basic facts, settings, and concerns • formulating and focusing questions for future research • generating new ideas and conjectures • determining the feasibility of conducting research • developing techniques for the future location and measurement of data	• providing a detailed, highly accurate picture • locating new data that contradict past data • creating a set of categories or classifying types • clarifying a sequence of steps or stages • documenting a causal process or mechanism • reporting on the background or context of a phenomenon	• testing the predictive power of a theory or principle • elaborating on and enriching a theory's explanation • extending a theory to new issues or topics • supporting or refuting an explanation or prediction • determining which of several explanations is the best

Source: adapted from Neuman (2000:29, Box 2.2)

Regarding the first dimension, the *objective* of this thesis is to understand how clusters stretch their networks to ensure local entrepreneurship. A particular concern is that organising contexts are employed for instigating and sustaining relations and collaborations and prompting entrepreneurial processes in clusters. The thesis furthermore aims at understanding the role of the interaction between networks and ITFs for ensuring local entrepreneurship in clusters.

Regarding the second dimension of research, *the treatment of time*, Neuman (2000) proposes three general ways of treating time: cross-sectional, longitudinal, and case-study treatments. Cross-sectional research is quantitative and conducted at a single point in time by means of surveys and experiments. It is consistent with a descriptive and explanatory approach to research. Longitudinal research examines the features of one phenomenon, following its patterns of change from one point in time to another. The case-study approach is a qualitative method that focuses on one or more cases

either for a limited or over a long period. The case-study approach can have exploratory, descriptive or explanatory objectives. This thesis relies on a case study approach; it employs observations, documents, interviews and surveys that were conducted at specific periods of time.

The third dimension, *research methods applied*, refers to the methods used to gather data (Neuman 2000). A researcher can gather quantitative data by means of, for instance, surveys, experiments or case studies. Case studies have become gradually more prevalent in the field of entrepreneurship and business management. According to Yin (1984) a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon concerned and its context are vague. Case studies concentrate on a single phenomenon and the research aim is to uncover the interaction of significant factors characteristic of the phenomenon. Such a method, furthermore, copes with technically distinctive situations in which there will be many more variables of interest than indicated by data. It relies on multiple sources of evidence, which means that a researcher can gather data via archival research, direct observation, participatory observation, interviews and surveys. Within a positivist approach case studies benefit from prior theoretical propositions guiding data collection and analysis. This of course indicates that a case study is guided and restricted by previously stated theoretical propositions. This thesis employs a case study to address the cluster and its network, i.e. the cluster network. The case study method is one of the most appropriate methods for studying cluster networks and their associated networking activities. Another reason for selecting the case study method is that part of the aim of this study is to inquire into the role of ITFs for enhancing networks and contributing to local entrepreneurship. Within the case study, cross-sectional methods were useful in defining the networking activities taking place between individuals, firms and institutions in a single cluster and at ITFs. The case study relied on descriptive statistics and SOCNET (Borgatti *et al.* 2002) to map the cluster network and determine the ITF activities that were beneficial to local entrepreneurship.

4.3 Unit of analysis

Network research offers the possibility of combining various levels of analysis (Galtung 1967), and it is thus crucial to define the unit of analysis of this thesis. Networks can be addressed from three units of analysis: the actor network, dyadic network, and the cluster network. Since this thesis focuses on the organising context, its basic unit of analysis must be the cluster network. This makes it possible to study some essential elements of the

organising context anchored in the cluster, which is the root of the local overlapping relations and collaborations.

4.4 Case selection

Clusters containing a rich variety of firms, institutions, activities and events obviously provide the most intriguing data than others. In studying cluster networks access to data is crucial, so the researcher must find a way to be welcomed in firms, private clubs and associations. Choosing the wrong cluster network may put the researcher up against legal, financial or even political barriers. Given these considerations, the case selection for this study was restricted by the following three criteria:

1) **Noticeable activities of a cluster:** A cluster that constantly organises joint events, participates at ITFs and promotes its activities through a website. These activities provide an initial indication of the existence of some form of network at the local-global interplay.

2) **The existence of an institution that represents the cluster:** In addition to the above criteria, the existence of institutions (i.e. non-profit organisations) representing firms in a cluster is a central aspect in the selection. Active non-profit organisations commit their members into organising new activities. Such organisations often have their own websites to promote their activities.

3) **Low-tech clusters:** This researcher is mainly interested in traditional clusters, since the networking activities taking place between firms and institutions may be necessary to foster the continuous renewal in clusters.

Based on the previous discussion concerning case-selection criteria, the cluster selected for the field work in this thesis is Lammhult. The Lammhult cluster was chosen because it has a business life in which social-cultural values, technical language, and an industrial tradition are shared. The Lammhult cluster is located in southern Sweden. Lammhult is a small community with 2,000 inhabitants with a dominant furniture industry. In the last few decades, furniture production has emerged as a dynamic activity incorporating soft and hard woods and new materials with the support of information and communication technologies (ICT). Manufacture planning systems combined with numeric control machines, groupware and computer aided designs (CAD) have facilitated the creation of new markets, ergonometric styles and environmental-friendly designs. The Lammhult cluster is characterised by a dense network of relationships between individuals spreading know-how, know-what and know-who. The

codification of tacit knowledge from engineering drawings to CAD files has prompted the formation of a local knowledge basis.

4.5 Criteria of quality

Two criteria are commonly used to gauge quality in qualitative and quantitative studies: *validity* and *reliability*. Yin (1984) proposes that researchers could use a range of tactics to achieve validity and reliability when conducting case studies. *Validity* is about accuracy and whether the operationalisation indicates what it is supposed to measure. Yin (1984) describes three types of validity: *construct validity*, *internal validity*, and *external validity*. Table 6 summarises the criteria for assuring the quality of research in case studies.

Table 6. Criteria for assuring research quality in case studies

Criteria	Objective	Tactic
Construct validity	• having correct measures	• using multiple sources of evidence • establishing a chain of evidence • having key informants review a draft of the report
Internal validity	• establishing casual relationships	• doing pattern matching • building explanations • conducting time-series analysis
External validity	• establishing a domain in which the findings can be generalized	• using theory in single-case studies • using replication logic in multiple-case studies
Reliability	• assuring that the study can be repeated with the same results	• developing a database • using a case-study protocol

Source: adapted from Yin (1984: 34, figure 2.3)

Construct validity requires that measures have clearly defined conceptual boundaries. To ensure construct validity, researchers can use multiple sources of evidence, and then establish a chain of evidence with the data

collected. Researchers can also have an informant review a draft of the report.

Internal validity is mainly a concern in explanatory cases in which the researcher is interested in determining casual relationships. Yin (1984) introduces several tactics to ensure such validity: having several propositions structuring a theory that guides the whole research process (i.e. pattern matching), building a theory from the results of the case (i.e. explanation building) and using various time-series analyses to evaluate changes and evolution (i.e. time-series analysis). Pattern-matching can also be used in descriptive and explanatory research as long as the researcher specifies the propositions within a theory prior to data collection.

External validity defines an area in which the findings of a study can be generalised analytically; Yin proposes using a theory in single-case studies to help identify other, later cases to which the results can be generalised. He also suggests studying multiple cases, which cross the boundaries of a single case.

The other quality criterion is *reliability*, which refers to consistency – the expectation that findings will remain the same each time the case study is replicated. A common tactic used by social scientists is to develop a database to which they can return; another is to ask informants to read the research report in order to corroborate the information.

4.6 Research design

This thesis is designed to be reportable in five papers, each related to a different research question and a different order of the proximity conceptual framework. The results of the papers build on one another and together accomplish the aims of the thesis. Table 7 summarises the research design.

Table 7. Research design of appended papers

No. (1)	Research strategy				Conceptual framework: Global spaces for entrepreneurship			
	Research objective (2)		*Time dimension*	*Methods of data collection*	*Organising context*	*Order of proximity (3)*		
	1	***2***				***IC***	***ITF***	***H***
I	X		Cross sectional	Case study	Territorial	X		X
II	X		Cross sectional	Case study	Territorial	X		
III	X	X	Cross sectional	Case study	Territorial & functional	X	X	X
IV	X	X	Cross sectional	Case study	Territorial & functional	X	X	X
V	X	X	Not applicable	Theoretical paper	Territorial & functional	X	X	X

Notes:

(1) No. stands for the number of corresponding paper in this thesis.

(2) The research purpose is accomplished by answering the following questions:
- How do clusters stretch their networks in order to foster local entrepreneurship?
- What role does the interaction between networks and ITFs play for promoting local entrepreneurship in clusters?

(3) The orders of proximity are: intra–cluster (IC), ITF, holistic (H).

4.6.1 Paper I: The institutional embeddedness of inter-firm networks: a leverage for business creation

This paper provides a basis for identifying a territorial organising context. It addresses the social embeddedness characterising the economic activities taking place between firms, and between firms and government agencies and non-profit organisations at a specific time in the Lammhult cluster. This paper refers to government agencies as 'economic institutions' and non-profit organisations as 'social institutions'. The networking activities are featured by a permanent geographical proximity and a permanent relational proximity concentrating on the first and third orders of proximity. The methods and quality criteria of this study are:

Methods of data collection and time of the study

The data collection was conducted by means of a cross-sectional survey in the year 2000. The sample covers 29 firms, 20 economic institutions, and 49 social institutions in Lammhult. The economic institutions include public development organisations and municipal authorities. Social associations comprise churches, rotary clubs and sports clubs. The survey was sent to the owners and/or managers of the firms, and to key administrators of the economic and social institutions. Each firm was asked about its networking activities in relation to local businesspersons and all relevant local economic/social institutions. The survey is included in the appendix to Paper I.

Methods of data analysis

The network data provides information about direct relationships between the various organisations. The owners and/or managers were asked to indicate their established relationships on lists covering various types of relationships with firms, economic institutions and social institutions. This information was used to create various datasets: nine 29×29 adjacency matrices concerning business-to-business relations, eight 29×20 matrices concerning business-to-economic-institution relations, and five 29×49 matrices concerning business-to-social-institution relations. The survey data analysis was carried out using social network analysis. Technically, this method combines graph analysis, algebra and statistics (Borgatti *et. al.* 2002). SOCNET was combined with statistical techniques to analyse the social embeddedness of the economic activity.

Quality criteria

This paper uses validity and reliability criteria to ensure quality in the research process. *Construct validity* was obtained by directly asking the owners and/or managers about the existence (or lack) of a relationship with each of the firms and institutions in the sample. In the survey every businessperson in the network identified his or her relationships with the other actors in the sample. When two actors corroborated a relationship with one another, the relationship is said to be reciprocated and, at the same time, is assessed as a construct. This means that this paper did not use multiple sources of evidence in the traditional sense (i.e. combining observation, interviews, archival records and surveys). Instead it used a roster which included all the surveyed firms and institutions. From this list every actor had to indicate the type of relation featuring the interaction with the others. In order to enhance validity a chain of evidence was also established during the elaboration of this case study. Theoretical propositions were first established in order to collect and analyse data and support conclusions accordingly. This thus indicates that a pattern-matching strategy was followed in order to obtain *internal*

validity. This pattern is constituted by the predicted three orders of embeddedness, confirmed by the empirical evidence. The *external validity* of this case is achieved by using an embeddedness framework that can be used to address embeddedness in other organising contexts than those of geographically demarcated clusters. The *reliability* of the survey was guaranteed by administering an instrument developed by Johannisson and applied several times in different settings (e.g. Johannisson *et al.* 1994). *Reliability* was also achieved by building a database with the survey data.

4.6.2 Paper II: Theoretical and methodological challenges: bridging firm strategies and contextual networking

This paper explores four rival frameworks for studying a cluster network and its networking activities in Lammhult. It identifies a territorial organising context featured by a permanent geographical proximity and a permanent relational proximity. It focuses on the way central firms define their networking strategies within a first proximity order. The methods and quality criteria of this paper are as follows:

Methods of data collection and time of the study

This paper comprises a case study that was also conducted in Lammhult in 2000. It combines two research strategies: a cross-sectional survey and structured interviews. The survey in this paper is the same as that used in Paper I. The structured interviews were conducted with three central actors in the cluster network. The structured interviews were designed through operationalising four rival frameworks in eleven dimensions. Each dimension was operationalised by means of four statements that corresponded to each of the strategy frameworks. These statements were written on cards presented to the owners and/or managers, who were asked to rank four statements for each dimension with respect to their relevance to the firm. The dimensions are included in the appendix to Paper II.

Methods of data analysis

The survey analysis was carried out by means of SOCNET and descriptive statistics. With SOCNET the central members of the network are identified and interviewed. The structured interviews were analysed by elaborating on a database created from their responses. The overall theoretical orientation of the firm was identified according to which strategy framework they favoured the most.

Quality criteria

The quality criteria for the survey were already mentioned with regard to Paper I. The items in the interview form were validated by having a firm

owner read each of the statements in the structured interviews. The researchers are, however, aware that these dimensions may have limited *construct validity*, since each theory was operationalised through only eleven statements. *Internal validity* was assessed by providing rival theoretical propositions operationalised through various statements prior to the data collection. These statements were tested to formulate the conclusions. *External validity* was achieved by selecting not only a central firm, but also two other fairly centrally positioned firms in the network. *Reliability* was achieved by creating a database for the paper out of the empirical study.

4.6.3 Paper III: International trade fairs as amplifiers of proximity in clusters

This paper identifies an organising context which combines territorial and functional facets. It also addresses the three orders of proximity featuring the socio-economic activities taking place between local and non-local firms. The methods and quality criteria of this paper are as follows:

Methods of data collection and time of the study

The data collection was conducted by means of a cross-sectional survey in the year 2005. The sample included 31 firms in Lammhult. The survey was sent to the owners and/or managers of the firms. Each firm was asked about its networking activities in relation to local businesspersons and ITFs. The survey is included in the appendix to Paper III.

Methods of data analysis

The network data provides information about direct relationships between the various firms. The owners and/or managers were asked to indicate their established relationships on lists covering various types of relationships with firms. This information was used to create various datasets: four 31 × 31 adjacency matrices concerning business-to-business relations. In this paper the data analysis included information on the frequency of participation at ITFs and the frequency of relations and collaborations that were instigated at ITFs in order to inquiry the existence of a third order proximity. The survey data analysis was carried out using SOCNET and descriptive statistics inquire into the proximity of the socio-economic activities.

Quality criteria.

This paper uses validity and reliability criteria to assure the quality in the research process. *Construct validity* was obtained by using a roster that included all the surveyed firms. When two actors corroborated a relationship with one another, the relationship is said to be reciprocated

and, at the same time, is assessed to be *construct validated*. This means that this paper did not use multiple sources of evidence in the traditional sense (i.e. combining observation, interviews, archival records and surveys). In order to construct validity a chain of evidence was established during the elaboration of this case study. Theoretical propositions (i.e. order of proximity) were established in order to collect and analyse data and elaborate the conclusions. This implies that a pattern-matching strategy was followed in order to obtain *internal validity*. This pattern is constituted by the predicted three orders of proximity, which was confirmed by the empirical evidence. The *external validity* of this case is achieved by using a proximity framework that can be applied to address proximity in other organising contexts like a trans-national company, congresses and commercial missions. The *reliability* of the survey was guaranteed by administering an instrument developed by Johannisson and applied several times in different settings (e.g. Johannisson *et al.* 1994). *Reliability* was also achieved by building a database with the survey data.

4.6.4 Paper IV: Revisiting knowledge cross-fertilisation and clusters by means of international trade fairs

This paper also mapped an organising context which combines territorial and functional facets. This implies that it addresses the three orders of proximity of socio-economic activities between local and non-local firms.

Methods of data collection and time of the study

This paper comprises a case study that was also conducted in Lammhult in 2005. It relies on the same cross-sectional survey as that used in Paper III.

Methods of data analysis

The network data provides information about direct relationships between the various firms. The data analysis was based on the same four 31 × 31 adjacency matrices concerning business-to-business relations. The survey data analysis was carried out using SOCNET and descriptive statistics to investigate the proximity of the socio-economic activities. In this paper the data analysis included information on the frequency of participation at ITFs, the frequency of relations and collaborations that were instigated at ITFs and the innovation activities of the Lammhult firms after having participated at such events in order to locate the existence of a third order proximity.

Quality criteria

The quality criteria for the survey are the same as mentioned with regard to Paper II.

4.6.5 Paper V: International trade fairs as alternative geographies of knowledge

This is a theoretical paper that focuses on the third order of proximity. It explains how an organising context combines territorial and functional facets for ensuring knowledge cross-fertilisation and entrepreneurial processes. Thus the method and quality criteria are treated differently in this research process.

Methods of data collection

This paper elaborated on a theoretical framework that is informed by a literature review in the fields of entrepreneurship, geography, international business and industrial marketing. Thereby it does not collect data in the traditional sense; its data collection is restricted to the review of relevant examples that are used to show how the theory functions. Multiple sources of evidence were combined to exemplify how ITFs resemble clusters. These sources of evidence are: observations and archival documents from trade associations and information posted at websites and related literature. The conceptual framework for knowledge cross-fertilisation between and within clusters and ITFs was exemplified with three cases identified in three papers.

Method of data analysis

In this paper the literature is examined in order to build a conceptual framework that helps us explain knowledge cross-fertilisation between and within clusters and ITFs. Thus several theoretical propositions have been integrated in a conceptual framework to understand the mechanisms used for knowledge cross-fertilisation between and within clusters and ITFs. The selected empirical examples illustrate how they fit the theoretical propositions.

Quality criteria

This paper does not apply to validity and reliability criteria. This paper is built up by presenting three examples found in the literature. These examples illustrate briefly the interaction between a cluster and ITFs; between fashion shows and associated industries; and between advertising professional service firms and international congresses.

5. Summary of the papers

This section presents the main findings and conclusions of the five papers that comprise this thesis. The findings and conclusions are discussed in relation to the theoretical framework for the three orders of proximity elaborated in chapter 3. This also means that the contribution of each paper to the research objective and questions of this thesis is emphasized.

5.1 Paper I: The institutional embeddedness of inter-firm networks: a leverage for business creation

This paper examines the embeddedness of a cluster. The theoretical proposition behind the embeddedness of the economic activity is that firms are involved in a cluster network. This theory is operationalised by means of a simple model that integrates three orders of embeddedness featured by a permanent geographical proximity and a permanent relational proximity. The first order of embeddedness refers to relationships between firms. The second order of embeddedness adresses firms' relationships with social and economic institutions, and the third order of embeddedness corresponds to the potential for business creation arising from indirect relationships with social and economic institutions. The first order of embeddedness corresponds to the intra-cluster proximity and the third order to the holistic proximity. The third order, in particular, addresses those relations that can potentially generate business opportunities.

The findings suggest that Lammhult has a cluster network in which personal and business concerns are realised. Regarding the intra-cluster proximity, firm-to-firm relationships, 18.7 percent of the total possible local commercial relations between the firms have been realised (i.e. 75 out of 406), as have 23.9 percent of the possible friendship relations (i.e. 97 out of 406). Regarding firm-to-institution relations, the empirical evidence indicates that firms are in contact with at least two economic institutions for discussing and solving their problems. Similarly, firms are on average members of more than three social institutions. To explore the holistic proximity it was investigated to what extent local businesspersons who are not commercially linked are members of the same social and economic institutions. The findings show that 60 percent of the firms that do not have local commercial relations shared such meeting places at the economic institutions.

This paper concludes that the operationalisation of the model helps disclosing that firms participate in various social and economic institutions. In these institutions firms that are already commercially related to one another also meet other firms to which they are unrelated. This suggests that

the social interaction triggered between these actors at the institutions is important for *three reasons*. *First*, the social interaction realised at institutions indicates that firms can stretch their networks in order to generate potential opportunities for business and cluster renewal. Because of the conviviality of the periodical sessions or special events of the institutions, firms can engage in dialogical situations between them. Firms converse with their colleagues for updating on each other's plans, activities and problems. These dialogical situations can thus instigate mutual trust over time. *Second*, the social interaction makes feasible the continuous renewal of firms and clusters. Firms can better choose collaborating partners without being afraid of opportunism. Firms know that they will be treated with attention and respect by someone who can provide the help or support needed. Thus, ideas and knowledge get to be shared easily for realising new or established joint enterprises in clusters. *Third*, firms can keep the doors open to those actors that firms do not wish to collaborate without a fear of reprisal. The opportunity to work together may be yet to come when the support and contributions are mutually beneficial.

One important finding is that when firms were asked about the location of their five most important business contacts, 16.6 percent of them indicated that they were located in the cluster itself, while 83.4 percent said that they were located elsewhere in Sweden or abroad. This indicates the importance of relations outside the cluster and the need to develop methodologies allowing researchers to place those relations and their influence on the cluster.

5.2 Paper II: Theoretical and methodological challenges: bridging firm strategies and contextual networking

This paper studies the networking strategies of central firms in a cluster network. It has its point of departure at the intra-cluster proximity. The paper associates the firm strategies and contextual networking with four different frameworks: the resource-based, industrial-organisation, virtual-organisation, and industrial-district frameworks. According to the resource-based framework, a firm defines its networking strategy by prioritising the development of its resources and capacities. In the industrial-organisation framework, market needs and opportunities determine a firm's network. In the virtual-organisation framework producers and customers generate value by joint collaboration across places. Finally, in the industrial-district framework the permanent geographical and permanent relational proximities between firms define their contextual networking.

The findings of the Lammhult network analysis indicate that centrally positioned firms were the larger, central, and more successful firms which are also the most linked ones in the cluster network. The three firms all use advanced ICT. Three of the centrally positioned firms were interviewed to evaluate their strategies and related networking associated to the organising context. The results reveal a number of interesting findings. To begin with, no single strategy framework was able to fully catch the strategic behaviour of the three firms. There are three possible explanations for this, which include theoretical and methodological concerns. *First*, the adopted strategy frameworks are either developed with large firms (resource-based and industrial organisations) in mind or are still conceptually underdeveloped (virtual organisations and industrial districts). *Second*, our general networking model and the related operationalisation may favour some frameworks and disfavour others. *Third*, our operationalisations of each strategy's ascribed core features may be inappropriate. Yet, the overall result of the three firms agreed in a strategy that combined features of the resource-base and the virtual-organisation frameworks. This is important, since when firms by definition develop such networking strategies, they value high-technology devices and partnerships in a globalised world. Firms thereby build new products and processes supported by multiple partners; they appreciate partners who encourage knowledge-sharing for co-creating business opportunities.

The findings in this paper indicate that firms not only prefer a territorial organising context; these results suggest that firms favour those partners who posses the complementary resources in spite of their location (i.e. the functional and/or virtual organising context). Thus the temporary geographical proximity and temporary relational proximity in a cluster network may enhance an organising context favouring global contacts for certain aspects but choosing to stay local with certain key partners. This further reaffirms the need to consider firms' non-local relations and collaborations when studying global spaces for local entrepreneurship.

5.3 Paper III: International trade fairs as amplifiers of proximity in clusters

The aim of this paper is to explore the role of ITFs for stretching networks and ensuring local entrepreneurship. To this purpose a proximity framework is integrated to inquire how non-local foreign relations encountered at ITFs are inter-connected in a cluster network of multi-stranded relations. The cluster network depicts the multi-stranded relations in which the same firms are simultaneously 'embedded' for business and innovation purposes at three proximity orders. The first order, the intra-cluster proximity, concerns the overall local networking. This includes the dialogical situations originated by

local friendship relations, local partnerships and local personal networking activities. The second order, the ITF proximity, comprises the dialogical situations created by trans-national friendship relations, trans-national market relations, and trans-national partnerships instigated and sustained at the events. The trans-national relations refer to the linkages with foreign firms. The third order, the holistic proximity, includes the cases in which firms engaged at ITFs interact with firms not participating at these events. This third order is important for ensuring local entrepreneurship in clusters. It addresses the relations and collaborations between the firms that actively use their ITF proximity and the firms that do not participate at ITFs. The firms that actively use their ITF proximity comprise those that: (1) participate at ITFs, (2) meet with existing customers and suppliers, and (3) find trans-national partners there.

The findings reveal that ITFs stretch the possibilities for inter-connecting local multi-stranded relations and trans-national relations. At the intra-cluster order in the Lammhult cluster firms were directly or indirectly interconnected with other firms participating at ITFs by means of their network of multi-stranded relations. Local friendship relations were important for connecting the overall firms in the cluster network (i.e. 113 relations out of 465). The social embeddedness provided a basis for firms in choosing collaborating partners while keeping doors open if needs/problems should appear. Personal networking relies on some of those friendship relations for business and innovation activities and is carried out in the overall network (i.e. 53 relations out of 465). While the resulting local partnerships are few in number (i.e. nine relationships out of 465 possible), they link firms whose most important supplier is located either in Lammhult, in the rest of Sweden or abroad. This is important for bringing in external knowledge and generating geographical openness. This also suggests that firms make a conscious selection of the products (i.e. components) that they want to continue producing at close quarters. This is probably because of the degree of tacitness and advanced specialisation required to generate such products.

At the ITF proximity the Lammhult cluster includes 13 firms that participate at ITFs. Firms attend as visitors to two ITFs annually on average and exhibit on average at three ITFs. Furthermore, two firms reported having obtained their most important trans-national friendship relation at ITFs; seven firms stated having found their most important trans-national market relations (i.e. one customer and one supplier) and nine firms reported having obtained trans-national partnerships there. The overall meaning of these numbers is that firms benefit from exhibiting products and visiting ITF, because they have people visiting and trading at their booths. Such numbers indicate that these firms use ITFs as a platform for connecting with non-local partners.

At the holistic proximity order there are three central results of this paper. Of the local friendship relations 20.5 % are shared between firms that participate at ITFs and the firms that do not (i.e. 23 out of 112 possibilities) while 33.3 % of the local partnerships (i.e. 3 out of 9 relations) are shared between the firms that participate at ITFs and those that do not participate. Of the existing personal networking 33.96 % is realised between the firms that participate and those that do not participate at ITFs (i.e. 18 out of 53 relations).

This paper concludes that the holistic proximity has probably had a major influence on the continuous renewal of the cluster network for *three reasons. First*, firms participating at ITFs had access there to the latest fashion trends and novel technologies. Fashion trends and novelties can be disseminated by means of the relations and collaboration linking firms participating at ITFs and firms that do not. *Second*, firms representing the Lammhult business cluster are also engaged in the collective promotion of their industrial activities at international furniture trade fairs. This fosters a collective preparation between firms for participating at ITFs and initiates further entrepreneurial processes. These processes guarantee the spreading of novelties across Lammhult after ITFs. *Third*, firms combine territorial and functional logics when building their organising contexts. The organising context is manifested in a loosely coupled network constituting 'global spaces for local entrepreneurship'. Jointly the firms create a logic ensuring the firms' continuous venturing and sustaining their networking.

To understand these conclusions, it becomes clear that future research should test the robustness of this framework and consider how, by means of regular participation at ITFs, these firms observe and talk about the latest innovations and influence the continuous renewal of firms and clusters.

5.4 Paper IV: Revisiting knowledge cross-fertilisation and clusters by means of international trade fairs

This paper elaborates a proximity framework and provides empirical evidence of the role of the interaction between a network and ITFs for ensuring local entrepreneurship. The network depicts the multi-stranded relations in which the same firms are 'embedded' for business and innovation purposes at three proximity orders. The first order, the intra-cluster proximity, concerns the dialogical situations that are realised within local partnerships and local personal networking. The second order, the ITF proximity, comprises the dialogical situations that are fostered at the events between local partnerships and local personal networking activities, and new and existing trans-national partnerships. The third order, the holistic proximity, resituates the relations and partnerships in the network in which at least one firm produces new or improved products or processes after the ITFs. These relations and partnerships provide potential opportunities for

ensuring local entrepreneurship. At the ITFs firms obtain new interpretations and understandings of the acquired knowledge by means of their relations and collaborations. These interpretations and understandings are profoundly different from knowledge being developed in local contexts. They help firms to make strategic decisions about fashion, business practices and activities in marketing, finance, production and R&D. This triggers the further adaptation and rearticulation of the acquired knowledge according to previously related knowledge, ultimately generating product or process innovations.

The findings suggest that the cluster network is featured by local partnerships and local personal networking activities. There are 13 firms which have met other local partners at ITFs. This number implies that local firms employ their ITF participation as a mechanism to inform themselves about the products and activities performed by other local firms. Furthermore, 11 of the Lammhult firms reported meeting concurrently with a trans-national partner and a local firm at such events. These meetings indicate the potential joint efforts made to build new understandings and interpretations of technological novelties and fashion trends relevant to the firms and their cluster. At ITFs more experienced firms can introduce younger local firms to potential partners. Firms can also realise joint offers to foreign customers in order to gain market access. Such numbers indicate that these firms use ITFs as a platform for sustaining and renewing their local and global networks. Furthermore, nine firms reported having obtained new trans-national partnerships at ITFs. These numbers suggest that the specialisation of the ITFs ensured finding the right people and firms for building an innovation capacity. Of the Lammhult firms 11 indicated celebrating a meeting with their existing trans-national partners at the events. These meetings were used to discuss issues specifically associated with innovation.

The holistic proximity focuses on the multi-stranded relations characteristic of firms that frequently introduced new or improved products/processes after having engaged at ITFs. The resulting number of local partnerships indicates that the collaborative efforts between firms that participate at ITFs and firms that do not are slightly bigger than the partnerships between firms engaged at ITFs. Three local partnerships are realised between firms participating at ITFs and firms that do not participate (i.e. 3 out of 9 partnerships). In contrast, 6 local partnerships are carried out between firms participating at ITFs (i.e. 6 out of 9 partnerships). These numbers indicate the complementarities occurring between firms with regard to jointly producing new or improved products. Such low numbers of partnerships reflect that firms realise such partnerships because of their specialisation and the potential strategic nature of their collaboration. It also indicates that firms prefer relations characterised by social embeddedness. Thus, 33.96 % of the personal networking activities are shared among firms participating at ITFs and firms that do not participate (i.e. 18 out of 53 relations) while 45.28% of

the existing personal networking activities are shared between the firms participating at ITFs (i.e. 24 out of 53 relations). These resulting percentages indicate that local personal networking activities between firms participating at ITFs are more frequent than the local personal networking between these firms and firms that do not participate at ITFs. Above all, these relations correspond to the persistent social interaction for the location, adaptation, and blending of the acquired knowledge with the re-use and reference of previously related knowledge. This interaction corresponds to the potential opportunities for creating new products and new processes in the cluster.

The study undertaken here has shown that local entrepreneurship was not only instigated by the firms engaged at ITFs. When resituating the holistic proximity, local partnerships and local personal networking activities linked firms participating at ITFs and firms that did not participate. These interactions also ensured local entrepreneurship. This outcome is important because it indicates that not all firms have the commitment or the financial means to engage at ITFs. These firms, however, were updated on what was happening in their global industries via their local partners. As their partners continued to buy their products or services, they continued creating and/or improving their products in order to sustain the multi-stranded relations with their local customers. The continuous interaction for the adaptation and blending of the acquired knowledge from ITFs with the re-use and reference of prior knowledge constitutes the entrepreneurial process that may eventually result in innovations and businesses.

Because of the specific research design of this paper, future research should test this framework across clusters and larger networks. Yet, the conceptual framework in this paper represents a step forward in understanding global spaces for local entrepreneurship associated with clusters and ITFs.

5.5 Paper V: International trade fairs as alternative geographies of knowledge

This paper is concerned with the complex patterns of knowledge cross-fertilisation within and between ITFs and clusters. At ITFs firms located at clusters engage in trade, product search, technology updating and networking. The aim of this paper is therefore to understand the relevance of the holistic proximity by addressing the underlying processes supporting the local entrepreneurship of clusters when employing ITFs. To this purpose, we introduce the concept of *knowledge cross-fertilisation* to address the consequences of dialogue, reflection and observation among participants (of ITFs) and non-participants of ITFs (as members of clusters).

During the interaction between ITF participants ideas and inspiration emerge and are subject to multiple forms of rearticulation. Such knowledge cross-fertilisation is fostered by individuals, firms and institutions located in clusters but undertaken by individuals participating in multiple ITFs. Hence, knowledge cross-fertilisation occurs as a by-product of the inter-connectivity within and between clusters and ITFs. When individuals, firms and institutions participate at these events, the nature of communication between them depends on chance, intention and improvisation. It is also stimulated because of the global standards for fashion trends, quality and business management practices. This proposition states that fashion knowledge (i.e. knowledge concerning consumer preferences) might emerge from one place, whereas technical knowledge of production might be located at numerous sites all over the globe. Altogether, fashion knowledge creates a basis for what is perceived as 'natural dialogical situations'. This is, however, a highly specialised conversation, where reflections about the latest news of fashion trends, business management practices, products and individuals take place. As it feels normal to engage in dialogical situations, participants create a global space for realising intense social interactions. Such interactions provide occasions where knowledge is reconstituted or merely transferred to clusters.

This paper suggests that knowledge cross-fertilisation generated at ITFs is circulated and advanced at clusters thanks to the organising context. This proposition entails that understandings and interpretations generated at ITFs can be exported from ITFs and be reinterpreted and improved in the process of being adapted, adopted and transformed with reference to prior related knowledge. The organising context as part of a collaborative environment provides a safe and ideal global space for local entrepreneurship, where individuals, firms and institutions coincide to further their knowledge. This is done by means of shared collective processes of sense-making, negotiating and engaging in trading-related tasks. All of these acts are accomplished through participation at multiple ITFs. In other words, ITFs draw together local and non-local firms and institutions working in organising contexts and being specialised in the same industry, product line or product category. ITFs offer such firms and institutions an arena for sustaining relationships of mutual engagement organised around what they are there to do (i.e. trade). Trading (or a potential trading situation) is, however, just the means to originate the knowledge cross-fertilisation process. ITFs thereby constitute alternative geographies of knowledge of central significance to the local entrepreneurship of clusters.

5. Conclusions

This section presents concluding comments and reflections as a basis for future research in global spaces for local entrepreneurship.

Cluster literature usually associates local entrepreneurship with the traditional perspective of an individual during the act of creation of his/her own firm and of the formation of clusters. This thesis has taken an alternative road and has argued that the view on local entrepreneurship proposed here has filled in *theoretical, empirical and methodological* gaps posed by the traditional perspective.

Theoretically, we have argued that local entrepreneurship is not ceased once firms and clusters are established; local entrepreneurship is about the continuous (re)creation of both businesses and clusters in global spaces. An emphasis on the continuous (re)creation is a central ability for the survival of firms and clusters; this ability is furthermore individual but also collective. The underlying reason is that local entrepreneurship is centered on the social interaction between individuals, firms and/or institutions; it materialises in the intended and unintended dialogical situations when there is a commitment to the continuous renewal of firms and clusters. Such dialogical situations carry with them an opportunity for co-creating new businesses, new products and new processes. The dialogical situations are not suggesting the idea that everything occurs in a friendly and tension-free tone. Rather these dialogical situations arise because they are part of the social world we live in. The frequency and outcomes of those dialogical situations can vary between firms depending on the size, networking-preferences and absorptive capacity.

We have also proposed that local entrepreneurship is carried on by co-creating an organising context, which ultimately manifests in networks. These networks are loosely coupled and have a fuzzy approach to the territorial boundaries traditionally ascribed to clusters. Thus, the social interaction and the joint enterprises between individuals, firms and institutions that are affiliated to the networks with those that are in the periphery, create an opening for the continuous renewal of firms and clusters. In the networks firms instigate or sustain their relations and collaborations with local and non-local individuals, firms and institutions according to the issues being dealt with. This also means that non-local partners are considered members of the network even if they are not physically situated in the clusters.

In order to understand how the organising context relies in the social interaction and joint enterprises, we have proposed three orders of proximity to map how networks are stretched to ensure local entrepreneurship. In particular, we have addressed the role of ITFs as a sort of extra-cluster proximity for establishing and maintaining such networks. We have termed this ITF proximity.

Empirically, in applying the three orders of proximity this thesis has shown that firms build organising contexts to stretch their reach and accessibility to local and non local actors in order to co-create potential opportunities. The empirical evidence has been mostly drawn from several case studies conducted in the Lammhult cluster in Sweden. At the intra-cluster proximity, networks combined relations between firms and between firms and institutions in the overall cluster. The networks have created a rich socio-economic texture that blends private and professional spheres. The findings here have reported the existence of friendship and personal networking relations in the network at Lammhult. These numbers have a low density (i.e. around 20% of the total possible relations are realised), thus this result confirms that the networks are loosely coupled and thus there is no oversocialisation pervading in the clusters. There are three possible explanations for this. *First,* two of the largest firms have hired new CEOs and 6 different firms were included in the 2005 survey with respect to the 1999/2000 survey. 5 of those firms have been created in the last five years. Above all, these firms need time to become acknowledged in the private and professional spheres of the cluster. *Second,* Lammhult is a cluster that is geographically located in the territories of two counties (Jönköping and Kronoberg). Because of this geo-political location, Lammhult firms have developed a capacity to self-renew. As it is not sure that firms will be supported by any of the two counties, Lammhult firms have learned to create inter-dependencies with both counties. This approach permeates to the private spheres. For instance several CEOs live in the surroundings of Lammhult, thus they have created a natural approach to supplement their local activities with non-local partners. *Third,* the existence of both friendship and personal networking relations guarantee that networks absorb changes without resistance and get reconstituted without reprisals. Firms keep their possibilities open because the potential businesses and innovations are in focus.

At the ITF proximity order 13 firms participated periodically at the events. At the ITFs Lammhult firms meet with other local colleagues and trans-national partners. These meetings provoke natural dialogical situations on topics that are relevant for generating innovations. ITFs create safe and intense settings by gathering specialised actors in an industry or line of business. These settings are triggered because the events combine work and fun in a short period of time. AT ITFs, intense socialisation happens and is

facilitated by drinks, snacks, seminars, dinners, parties and spontaneous encounters; this socialisation contributes to intensify the dialogical situations. The dialogical situations help individuals, firms and institutions to build a reference to one another and share common interests and get inspired. The Lammhult firms employed ITFs to celebrate planned and unplanned meetings with other local firms. Local partners convened spontaneously and by this means they updated on each other activities, products and plans. At ITFs, local partners also met with a third actor, namely trans-national partners. These meetings suggest the potential efforts of local partners to either introduce newcomers or better serve the needs of international buyers. There are three plausible reasons for this. *First*, the realisation of dialogical situations at ITFs put local partners in direct contact with their global industries. Firms thereby develop an awareness of the dominating trends, preferred styles, novel uses of products and technology, new materials and industry leaders. *Second*, the natural topics of conversation are the everyday events. These natural topics of conversation become the entry ticket for reflecting on the activities, views and practices of the firms. These moments are a source of inspiration and idea generation. One such example in Lammhult occurred with one of the firms initiated in 2002. The entrepreneur in this firm was an employee at one of the largest Lammhult firms; he was part of the team assisting to ITFs. In one dialogical situation at ITFs, two partner firms decided to create better booths to exhibit their products. This entrepreneur decided to leave his actual job and start a firm to produce ITFs booths. Up to date, all his customers have been obtained by recommendations given by the partners during ITFs. His finished booths employed at ITFs are the best presentation card of his work, thus, they constitute natural topic of conversation to initiate dialogical situations and even bridge with the customers of his previous job. *Third*, it will be too ideal to suggest that all firms can have one or even multiple dialogical situations of this kind. We do not propose that; it will be expected that newcomers of ITFs probably have less dialogical situations when they are not introduced by someone with experience in the events. For this reason, it is usually a low percentage of newcomers that return to a second ITF. Firms with less or no absorptive capacity can find ITFs of no use at all. Rather, they can think of ITFs as an expense rather than as an investment.

At the holistic proximity, the empirical findings report *three types of situations* in which there is a potential opportunity for continuous renewal. *The first situation* constitutes those cases in which firms that are not conducting commercial activities coincide at the local institutions. These cases put the firms in the position where they can screen partners and select those suitable ones for the projects at hand. These situations can also instigate encounters where opportunities are co-created. There are two relevant examples in Lammhult; the organisation of an annual massive event (i.e. Designers Saturday) and the collective participation of firms at ITFs.

Both of these events are organised by the local trade association and the firm in charge of the Lammhult brand (i.e. The Kingdom of Furniture). In the first example, firms have to create dialogical situations for deciding how to attract potential customers to Lammhult. The outcome of these dialogical situations results in events beneficial for the overall business community. In the second example, firms have to decide what topic and style will be in focus in the collective booth and what products shall be exhibited at ITFs. This reinforces the networks as partners have to prepare for the coming ITFs. *The second situation* constitute those cases in which firms that are participating at ITFs and have encountered trans-national partners there are connected with local firms, which are not participating at the events. These cases signalise that not all firms have to participate at ITFs to get the news of their global industries. Just because the sharing of news and anecdotes of the events are embedded in the everyday business life, they are not perceived as something extra-special; there are simple taken as part of a job-related-routine. In other words, partner firms are simple concentrated in doing their jobs; thus they have to generate new or improved products after or previous to ITFs. Yet, those new or improved products or processes have been influenced by the fashion trends met at ITFs. *The third and final situation considered in this thesis* comprises those situations in which firms that are participating at ITFs and producing new or improved product or processes after ITFs, are linked to those that not participated at the events. These situations indicates that as one of the partners introduces innovations after ITFs, it can be possible to suggest that the other partners will have to renew their products and/or processes in order to keep trading with his/her partner. This suggests that this type of interaction is motivated by the potential future rewards whether they be financial, legitimacy-building and/or accountability-confirming. Nevertheless, the motivation energises the innovation-generating joint enterprise. This motivational distinction is what makes the organising context significant. Other's interests are taken as one's own, and this commitment furthers individual endeavour to collective entrepreneurship.

These findings have been possible to accomplish because of the methodological developments when modelling relational data and using SOCNET. *Methodologically*, the research design in the first four papers integrating this thesis has contributed to make SOCNET available to a large number of researchers. SOCNET require advanced mathematical modelling and this situation have continuously created technical barriers to make the research understandable. Relying in SOCNET, the operationalisation and research analysis of the three orders of proximity have been developed with the objective of making the research accessible and understandable to a larger audience than those researchers specialised in networks. Traditionally, when inquiring networks, researchers emphasise the existence of certain structural properties of the networks in order to meet their theoretical propositions (i.e. density, centrality). It is also the existence of the network

structure in association to certain independent variable that is in focus in research (i.e. absorptive capacity, centrality, profits). In contrast, we have followed a different direction. By centering on the social interaction potentially creating businesses, products and processes, we have shifted focus. We have emphasised instead the opportunities that can be originated when a business is not realised or when a new product has not been generated yet. The social interaction occurring during the realisation of the potential opportunities are relevant for developing ability for the continuous (re)creation of firms and clusters. As a form of creation, the social dimension is central in the process of renewal of firms and clusters.

Despite the methodological development of this thesis, it is important to mention *four noteworthy limitations* of the empirical evidence and the conceptual framework presented here. *First*, this thesis has relied upon the Lammhult cluster to provide empirical evidence to our conceptual framework. This Swedish cluster is small in comparison to other clusters in the world, which are integrated by hundred of specialised firms. Larger clusters and databases are needed to corroborate the findings in this cluster. The *second limitation* is that the associated findings should be evaluated carefully as the results contain low frequencies to sustain ITF proximity and the holistic proximity. Thus, future research need to test the strength of the conceptual framework proposed in this thesis. The *third limitation* is that this thesis has placed an emphasis on the three types of situations relevant for potentially creating opportunities. These three types of situations were mentioned previously at the holistic proximity. There are in our mind other types of situations, which could be equally relevant. Four such examples are: short meetings and visits to plants of foreign partner firms (Pinch *et al.* 2003, Torre and Rallet 2005), relations initiated at congresses and conventions and international commercial missions (Wilkinson and Brouthers 2000, Maskell *et al.* 2006), the relocation strategies of firms to other countries (Biggiero 2006) and the increase interaction with distant partners via information technologies (Carbonara 2004). Future research shall consider these alternative situations and weight them against ITFs. The *fourth limitation* is the research design; while the research method here chosen uses SOCNET to inquire these situations, ethnography studies could be a significant means to understand the intended and unintended dialogical situations when there is a commitment to the continuous renewal of firms. Thus future research shall consider adopting other methodologies that concentrates on the creation of opportunities out of the cross-fertilisation of knowledge in organising contexts.

Regardless of these limitations, this thesis has contributed to create an opening for the continuous renewal of firms and clusters via global spaces. In this thesis, we have used the example of an organising context that has been created between firms and institutions, or between firms and partners

encountered at ITFs. Faulconbridge (2006) provides an alternative example of organising context, which is formed by advertising professional service firms working at the same group of firms and meeting at congresses. His findings show that professional consultants actively use congresses to meet their colleges and socialise with them. In the congresses, the conviviality of their jobs, make it easy to encourage the exchange practices, sharing of experiences and non-confidential insights. These dialogical situations inspire people to do their job better and take different directions. In a similar vein Weller (2007) shows the example of the organising contexts created by fashion shows and associated industries. She specifically illustrates that collections produced and presented at one fashion show in one part of the world, rhythmically and systematically influenced the fashion and related production at other side of the world. In our mind these examples constitute global spaces for local entrepreneurship.

With the conceptual development of global spaces for local entrepreneurship, we have put forward the idea that such spaces enhance an ability to renew firms and clusters. The continuous renewal of firms and cluster is possible when individual and collective entrepreneurship is considered. According to The Concise Oxford English Dictionary (2001), 'renewal' means to 'bring fresh life' or 'strength'. Focusing on renewal as the trigger of local entrepreneurship, we want to revisit the concept of global spaces for local entrepreneurship.

We have put forward the idea that a global space for local entrepreneurship materialise in an organising context. In our mind the organising context includes certain features of the concept of 'constellation of interconnected practices' (Wenger 1998). Incorporating features of the communities of practice, Wenger (1998) used the concept to describe the constellations of practices found in a single organisation gathering individuals sharing practice. However, he did not support the idea that the notion can be used for addressing the interaction, relations and collaboration between individuals, firms and institutions. The organising context instead gathers local and non-local individuals, firms and institutions in networks. These actors share styles, related activities, similar conditions, challenges faced, mutual engagement and a joint enterprise *like in a constellation of practice*. However, the organising context is dominated by individuals, firms and institutions from around the world with rather similar representations, beliefs, language systems and views on the same description, job task and problem-solving approach (e.g. Amin and Cohendet 2004).

A constellation of practice has furthermore several kinds of members; two are of particular relevance for the organising context in the continuous renewal of firms and clusters (i.e. fully engaged members and members in the periphery). The organising contexts have fully participating members;

those are the actors that are connected via joint enterprises or social interaction to the networks. These actors are located in the cluster but there can be those that are not situated there. This situation is similar for the members in the periphery. These members are those potential partners that are identified through social interactions at ITFs (or other potential platforms like congresses or international commercial missions). They do not need to, even should not, be located in the clusters. Thus, the observation, dialogues and reflections occurring with the actors in the periphery allows them to gradually learn from each other out of their social interaction and practice (i.e. practice of participating at ITFs). The legitimate peripheral participation opens up for boundary spanning and can thereby trigger entrepreneurial processes cf. the need for fuzzy boundaries between the organising context and the enacted collaborative environment. At ITFs, actors in the periphery of the networks enact a collaborative environment for producing and circulating understanding and a way of expressing this understanding on their interests and activities. Their routinised and periodic interactions in the events provide individuals, firms and institutions with a direct influence from each other's experiences, understanding and interests. These interactions can ultimately yield to joint enterprises for the continuous renewal. Yet the actors in the periphery can choose to remain in the periphery and keep a weak attachment to the network. Thus, fully participating members and actors in the periphery help stretching networks ensuring local entrepreneurship. This fuzzy association to fully-engaged-members and members in the periphery at the local-global interplay constitutes an opening for potential creation; this opening can ultimately bring fresh life and energy into firms and clusters.

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Appended papers

Paper I

Johannisson, B., Ramírez-Pasillas, M. and Karlsson, G. (2002) The institutional embeddedness of inter-firm networks: a leverage for business creation, *Entrepreneurship & Regional Development*, **14**: 297–316.

Paper II

Johannisson, B., Ramírez-Pasillas, M. and Karlsson, G. (2002) Theoretical and methodological challenges: bridging firm strategies and contextual networking, *International Journal of Entrepreneurship and Innovation*, **3**: 165–174.

Paper III

Ramírez-Pasillas, M. (2007) International trade fairs as amplifiers of proximity in clusters, submitted to an international journal.

Paper IV

Ramírez-Pasillas, M. (2007) Revisiting knowledge cross-fertilisation and clusters by means of international trade fairs, submitted to an international journal.

Paper V

Ramírez-Pasillas, M. (2007) International trade fairs as alternative geographies of knowledge, submitted to an international journal.

Paper I

The institutional embeddedness of inter-firm networks: a leverage for business creation

by

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0. Abstract

There is an increasing concern for the notion of ‘embeddedness’ of economic activity; yet the conceptualisation of the concept and its operationalisation remain underdeveloped. First, embeddedness may concern on the one hand the structure of relations that tie economic actors together (structural embeddedness), and on the other hand the social strands supplementing economic strands in each relation (substantive embeddedness). In this paper, a network framework is outlined which proposes several layers or 'orders' of embeddedness. Focussing on small firms, the point of departure is individual exchange relationships as personal ties combining economic and social concerns. First-order embeddedness concerns the localised business networks created by combining these dyadic relations. Second-order embeddedness is achieved when considering also the memberships of business persons in economic and social local institutions while third-order embeddedness concerns the special cases where these institutions bridge gaps between firms. The network model is operationalised and applied to a small Swedish industrial (furniture) community, its firms and economic/social institutions. The findings generally support the applicability of the model and demonstrate the supplementarity of different layers/orders of embeddedness. Further research challenges are deduced and implications for practitioners provided.

Key words: *small business, personal networking, embeddedness, furniture industry, industrial district, graph analysis.*

1. Stating the problem

Nowadays the embeddedness metaphor is widely used when arguing that social networking contributes to economic activity, its organising, i.e. its initiation, continuity and dissolution, as well as its outcome (Larson 1992, Powell *et al.* 1994, Uzzi 1996, 1997, Dancin *et al.* 1999). By definition embeddedness means to be anchored in a larger structure (Hornby 1995). According to Granovetter (1985, 1992) embeddedness refers to the fact that 'economic action is affected by actor's dyadic relationships and by the structure of the overall network of relations' (Granovetter 1992:33). Through business networks, firms are included in different sets of market players that provide a wide range of opportunities and constraints (Gulati and Gargulio 1999). The economic sphere, however, is then not separable from other social spheres, which provide supplementary motives, and enacts alternative realities (Johannisson and Mönsted 1997). Firms, thus, do not only operate in business networks, but interact also with economic and social organisations and institutions. The notion of embeddedness of firms thus puts the searchlight on the fact that any business activity reflects a complex socioeconomic phenomenon.

Embeddedness signals networking as a generically dynamic phenomenon as it suggests that pressures for change and stability always coexist. However, there are few attempts to explain the dynamics (Halinen and Törnroos 1998). The structure and principles for exchange vary between networks according to e.g. the origin of the network and dominant technology (Johannisson *et al.* 1994). Networks also differ according to the types and amounts of exchange accumulated (Rowel *et al.* 2000). Over time, firms build and join several networks that become a growing repository of information concerning the opportunities and threats as regards economic exchange (Uzzi 1996). Obviously the notion of embeddedness also helps imagining the initiation of entrepreneurial processes as an existential as much as an economic endeavour.

The mainly metaphorical use of embeddedness as representing social complexity is, in our mind, insufficient. First, this defensive use of the concept means that its potentials are not tapped. Second, the concept obviously invites to cross-disciplinary research that seldom is taken advantage of. Third, the notion of embeddedness signals that the targeted phenomenon for research inquiries and policy measures should not be the individual firm but the socio-economic context wherein firms are embedded. Although there is an increasing concern for (regional) clustering and associated network programmes, mainly 'gazelles' (i.e. high growth firms) are still-hunted by both researchers and policy-makers. Here our ambition is to make some conceptual and empirical contributions to the understanding of

the complexities and dynamics of embeddedness. Thus, in the next section we will introduce different network constructs in order to elaborate upon the notion of embeddedness of business activity. In the third section, we outline the empirical study designed to investigate conceptualised images of embeddedness, and in the fourth section, we present our findings. The final section provides some suggestions for further research as well as implications for practitioners.

2. Embedding business activity

Networks constitute forms of voluntary cooperation that involve information sharing and/or mutual learning and exchange between their members, as well as social control. Firms obtain relevant information by means of their involvement in different networks (Galaskiewicz *et al.* 1985). Generally networking is associated with mutual trust. Proximity, e.g. physical, social and professional, enforces trust-building processes. Thus, regional studies propose that localised small-firms networks should be considered as an alternative to large-scale business operations (Becattini 1988). This research suggests that collective innovativeness, flexibility, and capacity is created by relationships between firms. The network structures however may vary considerably between different entrepreneurial settings (Johannisson *et al.* 1994, Rowel *et al.* 2000), cooperation agreements (Gulati and Gargulio 1999), and the contemporary local/global development (Capello 1996).

The network approach thus offers "a meso-level compromise to escape from the macro-level framework and firm centered views" (Araujo and Easton 1996: 93). We argue, though, that research, due to a vague theoretical and methodological base, has delivered confusing findings regarding how firms are embedded in spatial networks. One reason is that embedding means creating order and reducing uncertainty as much as providing the variety and ambiguity needed to create space for individual and collective entrepreneurship.

To our mind it is difficult to provide a thorough understanding of the global networking of the individual firm ('egocentric networking') without considering the overall networking ('sociocentric networking) between businesses in the context concerned. Elsewhere we have introduced the notion of 'organising context' to illustrate how the location can help the small firms to amplify their own initiatives and absorb external threats (Johannisson 1988). Additional features of a favourable organising context include dense personal networks between businesses, their co-ordinators, and further contextual agents as well as transparency, uniqueness and associated

strong identity, and favourable conditions for collective entrepreneurship (Johannisson 2000).

Figure 1 provides a general representation of the *organising context*. It is defined by its member firms and their interaction and is ideally self-regulated (Johannisson 2000a). The potential and limitations of individual member firms are thus to a great extent defined by the organising context. The organising context is a collectively enacted environment where the firms interactively co-create, i.e. socially construct and actualise, their own development conditions cf. the notion of 'structuration' according to Giddens (l984). Here we focus on organising contexts defined as a territory but they may as well be functionally (e.g. by industry affiliation) or virtually demarcated. The generally *enacted environment* (Weick l979, Smirchich and Stubbart l985) from the point of view of the individual firm includes further sense-making images and experiences and provides each firm with an action frame that reaches beyond the organising context. The enacted environment is recognised as being relevant to the development of the firm but in contrast to the organising context, not possible to systematically influence. *'Surroundings'* reflect the existence of an environment not (yet) known to, imagined by, the firm(s).

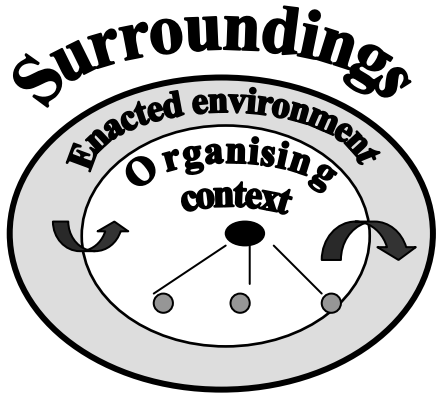

Figure 1. The Organising Context

In personal networks created and used by business persons social and business concerns combine already in individual ties (Johannisson 2000). Such trust-building relations provide identity, legitimacy and additional resources. Where a community spirit prevails the overall local business network is infused with shared values and mutual concerns, generated by and generate networking beyond economic exchange. Resources as well as learning experiences become shared, making a complex system that is

difficult to imitate and therefore creates regional competitiveness (Storper l995, Maskell *et al.* l998).

In our mind it is important to differentiate between what is here addressed as *substantive* or *systemic* embeddedness. The former notion of embeddedness represents the contents and the latter the structure of the social embeddedness of economic activity. Substantive embeddedness means that the origin of and base for exchange are not just calculative but ideological and/or genuine as well (Sjöstrand 1992). Zuckin and DiMaggio (1990) who elaborate on the nature of economic activity and the cultural and societal frameworks in which firms act. Larson (1992) and Uzzi (1996) use trust as the generic mechanism of (social) embeddedness in vertical supplier networks.

Systemic embeddedness refers to the overall fabric of relations that links economic and further agents in e.g. a local/regional cluster. The systemic embeddedness puts the individual actors in different positions, some more central, some more marginal, in the overall netowork. A favourable position usually means that many other actors in the network need the favoured actor to become (or remain) connected. Typically entrepreneurs look for positions that make them bridge such 'structural holes' in relevant networks (Burt l992, Gulati and Garguilo 1999). Granovetter (l985) is explicitly concerned with what we here address as systemic embeddedness and he then differentiates between relational and structural embeddedness. ‘Relational’ embeddedness to his mind refers to the ties individuals have to other agents (i.e. what we elsewhere have identified as ‘egocentric’ networks, cf. e.g. Johannisson 2000), while ‘structural’ embeddedness indicates the aggregate impact on the subject of all, direct and indirect, such relations in the context concerned (Granovetter 1992). Rowel *et al.* (2000) found, partially confirming Uzzi (1997), that structural embeddedness, i.e. indirect interdependencies, increases access to resources in existing direct linkages but not to further opportunities.

Research into inter-organisational fields states that institutionalision explains similarities across organisations (Di Maggio and Powell 1983). Institutions bring rules of the game to and reduce uncertainty as regards economic exchange (North 1990). Institutional influence may be formal or informal and concern the business system as well as the distant surroundings. Here we focus on formal structures and with Halinen and Törnroos (1998) we recognise that besides business-to business networks, linkages with economic institutions and social associations become increasingly important since they provide both resources and legitimacy. *Institutional embeddedness* builds collective entrepreneurial capabilities by developing, producing and marketing goods, services and knowledge (Van de Ven 1993, Rowel *et al.* 2000, Johannisson 2000). Interconnected ties indicate that firms may share

meeting points with other actors in the networks created by economic and social associations (Galaskiewicz *et al.* 1985). A unique feature of localised networks of firms is, thus, their embeddedness in a setting that also accommodates economic and social institutions (Araujo and Easton 1996, Becattini 1988). This statement invites to indirect networking, where such institutions may also bridge between firms which otherwise may remain disconnected in the business system. This kind of networking and the associated notion of institutional embeddedness is thus proposed to use the unique features of a territorial context for business activity. However, there is little empirical evidence that specifically shows how small businesses benefit directly and indirectly from networking not only between themselves but also with economic and social associations. Therefore this issue is our focus here.

In Table 1, we summarise our conceptual framework. We then want to point out that since the firms we have in mind are mainly small family businesses, we assume that the owner-manager epitomises her/his firm. This suggests that the business co-ordinator dominates the external relations of the firm (Johannisson 2000). This means that the individual and the firm levels of analysis are collapsed into one. Using our definitions of 'substantive' and 'systemic' embeddedness we identify three layers: *first-order embeddedness* (firm to firm relations), *second- order embeddedness* (firm relations to social and economic institutions) and *third-order embeddedness* (firm indirectly being related through social and economic institutions). The latter kind of networking we address as ‘holistic’ since it includes ties that can only be considered by studying the organised locality (context) as an entirety, including both business-persons and economic/social institutions, both direct and indirect relations.

Table 1. Alternative images of social and institutional embeddedness

Embeddedness	*First order Inter-firm networking*	*Second order Firm /Institution networking*	*Third order Holistic networking*
Descriptions	Business to business	Firm to social/economic institutions	Links between small firms through institutions
Systemic (Economic)	Commercial relations	Business acquiring services, joint projects	Indirect potential business exchange
Substantive (Social)	Personal business relations	Business co-ordinators as association members	through interacting economic and social institutions

It is important to underline that the overly positive image of embeddedness, and its implications from the point of view of the individual firm, is an outcome of our focus on embeddedness as an organisational phenomenon. As pointed out by Granovetter (l985) embeddedness means that agents may easily become exploited by those who misuse their trust. Also, embeddedness means strong social control and that opportunistic behaviour travels fast. The community that embeddedness creates may not only contain resourcing relations but distributed as well: you are expected to share your wellbeing. Too strong regional ties may create a lock-in, which may turn out to be disastrous for the business community (Grabher l993). The integration of firms and institutions may also cause tensions between both firms themselves and between them and the institutions. As competitors on global markets, firms may, as is the case in industrial districts, however benefit from both cooperation and competition. What is not as much recognised is that different values and action rationales of firms and institutions may erode not only their cooperation but also the spontaneous networking between the firms themselves (Johannisson 2000a).

3. Methodology

3.1 Research design

Social network analysis provides a comprehensive tool for mapping the complexity of contextual networking as the origin and outcome of the embeddedness of (local) economic activity. As discussed by Johannisson *et al.* (1994), there is a need for more elaborate, operational models covering the complexity of (spatial) contexts and also of different images of

embeddedness. This complexity is far beyond the mere aggregate of nodes (here firms) – e.g. a network of 29 includes 406 (29x(29-1)/2) potential mutual (reciprocated) relations. This complexity also announces inherent dynamics, ideally self-organising. The network structure is as much the outcome of reproducing exchange as of random events that, due to non-linear relationships and network interconnectivity, amplify into new patterns.

The adopted design technically combines graph analysis, algebra and statistics (Borgatti *et al.* 1999). This quantitative approach is demanding with respect to identifying and measuring network variables, data collection, graph-analytical modelling, and data analysis (Scott 1994). We therefore focus on a small local firm cluster and surrounding institutions to which we have privileged access through a regional small-business development organisation. We carried out the modelling and analysis with the help of UCINET V computer package statistics (Borgatti *et al.* 1999) and Minitab (State College 1999).

3.2 Sample data and network model

The sample includes 29 firms, 20 economic associations and 49 social associations in or in the vicinity of Lammhult, a small community (2,000 inhabitants) located in southern Sweden. The firms are the members of the local trade association. While prior research has used immigrant enclaves (e.g. Portes and Sensenbrenner 1993) and multicultural manufacturers (Uzzi 1996, 1997) in urban areas, this research covers traditional Swedish firms and their co-ordinators in a rural setting. Although only 9 of the 29 local firms are in the furniture industry, they include several firms which are nationally well-known and as a group these furniture companies dominate the local private employment. The remaining 20 local firms are quite heterogeneous and small. The economic organisations and institutions e.g. include the public development organisation, the municipal authorities, and the regional Chamber of Commerce. Social associations e.g. concern, beside the local trade association, e.g. independent churches, Rotary, and sports associations. The data was collected in a survey addressing the (owner) managers of the firms and key administrators at the economic and social associations. Each firm was asked questions about their local networking activity as regards the fellow local business persons/firms and all relevant local economic/social institutions.

3. Network measures and analyses

The business persons got a complete list of the local firms and were asked to indicate relations to each other firm on 9 different strands/kinds of relations. The network data thus provide information on directed, asymmetric ties. In a similar way the business persons were asked to mark established relations on lists covering the economic institutions (8 strands) and social associations (5 strands). In Appendix A all strands are presented and operattionalised (here only part of this data bank is used). The overall data set thus includes nine 29x29 adjacency matrixes as regards business-to-business relations, eight 29x20 matrixes concerning business-to-economic-institutions relations, and five 29x49 matrixes with respect to business-to-social-associations relations. These 'raw' network data can be combined within and between each subsample – the firms, the economic institutions and the social associations, cf. Figure 2. Only in the business-to business network can we identify symmetric, i.e. reciprocated, ties; the relations to the economic/social institutions for technical reasons remain asymmetric.

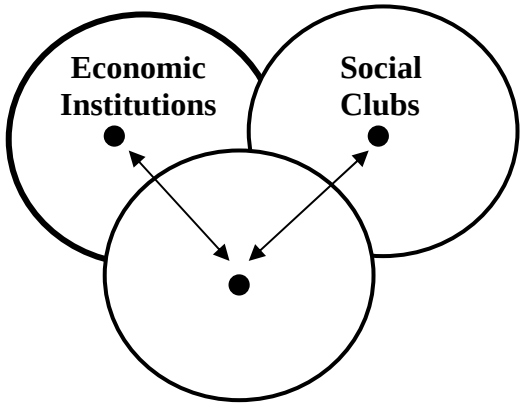

Figure 2. Network model: business and institutional (economic and social) relations

- **First-order embeddedness**

Looking into business-to-business relations we include three symmetric single-stranded relations, i.e. ties reciprocated by the two businesses/business-persons involved in the dyad, and one asymmetric as defined below. Table 2 shows the different types of exchanges we have considered in our analyses reported in this article. With respect to these network variables it is possible to compare with previous research adopting the same method (Johannisson *et al*. 1994). Using Granovetter's (1973) terminology, all single stranded relations may be addressed as 'weak' linkages. Therefore we also created multi-stranded ties that with increasing

strength include a *friendship* tie ('acquaintance' and 'talk' coinciding), a *personal-business* relation ('friendship' and 'commercial' combined), and a *complex* tie (intertwining 'friendship', 'commercial' and 'professional' ties/strands).

Table 2. Defining network strands

Strand	***Operationalisation***
Social strands	
Acquaintance	The CEO or anyone else in senior management and on the board of the firm is personally known
Talk	A face-to-face or telephone meeting was held with the senior management of the firm over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than the weather.
	Operationalisation
Business strands	
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the firm over the last nine months.
Professional (asymmetrical)	The staff of the firm is approached if an ingenious or challenging problem turns up.

- **Second-order embeddedness**

In order to measure the relations between firms and economic/social institutions, we adopted a two-mode network analysis (Wasserman and Faust 1994). That is, we developed adjacency matrices with 29 rows (the firms) and 20 columns for the economic institutions and with 49 for the social associations. These types of relations are by definition unidirectional (asymmetric) since it flows only from actors in one set (the business community) to the actors in another but not reverse, cf. Figure 2**.** Table 3 includes the relational variables in the network constituted by the economic institutions and Table 4 contains the relational variables making the social-institutions network.

Table 3. Firm relations to economic institutions

Strands	Operationalisation
Acquaintance	Somebody in the management of the institution is personally known
Talk	A face-to-face or telephone meeting was held with a representative of the institution over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than weather
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the institution over the last nine months
Problem solving	The staff of the institution is approached if an ingenious or challenging problem turns up
Projecting	Involvement in the institution with a development project over the last three years

Table 4. Firm relations to social institutions/associations

Strands	Operationalisation
Member	Being a member of the association
Entrustments	Being entrusted an administrative task in the association
Business exchange	Meeting with local business colleagues at different events

- **Third-order embeddedness**

Here we associate holistic networking and third-order embeddedness with the joint potential for networking provided by all three networks: business/business, business/economic institutions, business/social associations. Holistic networking includes e.g. situations where businesses are not directly related but are members of the same social association. Thus third order embeddedness is genuinely institutional because it signals that without the institutions the embeddedness of the business community is incomplete since a considerable number of business persons/firms remain disconnected, i.e. they are not directly related.

4. Findings

4.1 The empirical base: the Lammhult business Community

In Lammhult, there are about one hundred businesses, whereof, as indicated, the 29 largest ones are organised in a local trade association. Together, these 29 firms employ about 600 persons. The two largest firms each have about one hundred employees. The additional local firms that are not members of the association, most of them in trade and private services, only provide another 100 jobs (besides the 250 jobs in the public sector). At the time of the study (2000) the locality is aggressively promoting itself as 'The Kingdom of Furniture' in Sweden. The local trade association has taken a number of initiatives that have considerably vitalised the community over the last five years and made it visible all over Sweden.

In order to position the Lammhult cluster, we in table 5 compare it with the Anderstorp cluster, part of the most advanced industrial district in Sweden (The Gnosjö region) (see next page). The two clusters obviously are quite similar. The firms are of the same average size and in both locations are managed by founders in the same proportions. Lammhult and Anderstorp are also parts of the same wider regional setting dominated by small (family) businesses. It has to be kept in mind, however, that Anderstorp is considerably larger – twice as large with respect to population and, regarding number of firms (in each case the members of the local trade association), five times as large. The firm samples, though, do not differ that much. The local business network studied in Anderstorp has 67 members while the researched Lammhult business network has 29 members. In addition, a much larger proportion of firms are owner managed in Anderstorp than in Lammhult. The two by far largest firms in Lammhult are externally owned.

Some of the network data concern the global personal network of the owner manager/CEO. In both locations the business co-ordinators have discussed their business with about the same number of local colleagues over the last six months. Anderstorp's portion of contacts in the context, however, is higher than that of the Lammhult network, probably due to the much greater number of potential talk mates. In Lammhult the firms have a larger portion of their important contacts in other parts of Sweden and abroad. Presumably, this makes the personal network more able to provide strategically important information.

Table 5. The Anderstorp and Lammhult clusters - background data

Characteristic	Anderstorp cluster (67 firms) (1)	Lammhult cluster (29 firms) (1)
♦ *Firm structure*		
Number of firms	138	29
(respondents generally)	100	28
(respondents network data)	67	28
Firm size (employees) (2)	10 (28.8)	11 (23.0)
♦ *Firm management*		
Founder manager (%)	39.2	32.0
Owner manager (%)	84.5	58.3
♦ *General firm network*		
Proportion of entrepreneurs who have discussed business venturing with more than five persons over the last six moths (%)	61.5	60.0
Primary personal network within context (%) (3)	43.6	36.0
Most important business relation within the context (%) (4)	18.8	16.6
Market location (%) (2)		
♦ *Selling:*		
Contextual	5 (16.5)	3 (16.9)
International	5 (10.0)	5 (10.3)
♦ *Purchasing:*		
Contextual	10 (14.8)	4 (9.2)
International	5 (18.0)	0 (12.0)

Notes:

(1) The Anderstorp data was collected in 1990 and the Lammhult in 1999/2000.
(2) Medians with the means within parenthesis.
(3) The respondents were asked to identify the five most important persons they favoured when discussing their business in general, and to locate these persons.
(4) Importance was defined with respect to how long it would take to replace the contact (person/firm) in months.

4.2 First-order embeddedness

Networks between firms and business persons in Lammhult are very dense with respect to what portions of potential dyadic relations are realised, cf. Table 6 (see next page). 46.8% as regards 'acquaintances' e.g. means that out of 406 dyadic relations, 190 are enacted. Even compared with Anderstorp, representing the most advanced industrial district in Sweden, Lammhult stands out. One explanation of course is that the firm population is considerably smaller in Lammhult. In a smaller socio-economic setting overview of potential network mates is easier to accomplish and maintain;

the awareness of mutual dependencies is higher as well. However, also in comparison with other regional clusters of the same size Lammhult stands out with respect to networking, cf. (Johannisson *et al.* 2001).

Not to be surprised the networks in the furniture sub-cluster in Lammhult are denser than in the local industry at large. More surprising is that the difference is not largest in the commercial network, which would be expected due to assumed structuring in local production systems, but with respect to friendship ties. This in turn explains why the socially, i.e. substantively, embedded commercial network ('personal business' relations) is more than twice as dense in the furniture sub-cluster than in the local firm population at large.

Table 6. Network density business networks in Lammhult (%)

Relation Characteristic	Anderstorp (67 firms)	Lammhult (29 firms)	Lammhult (9 furniture firms)
Acquaintance	31.3	46.8	63.9
Talk	10.1	26.8	47.2
Friendship	8.6	23.9	47.2
Commercial	14.4	18.7	25.0
Personal business	n.a.	11.8	25.0
Professional	3.9	15.3	22.2

Note: All but 'professional' based on reciprocated relations. For definition of relations, cf. table 2.

In Table 7 the *relative* appearance of a particular kind of tie in the Lammhult business-to business network is calculated (see next page). That is, the table answers the question: if a relation is realised in the first place, what portion of the overall dyadic network relations will then be of a particular kind? The table thus reports conditioned probabilities.

Table 7 shows that the Lammhult furniture cluster stands out as regards its qualified ties with respect to social embeddedness. Here more than half of all existing ties between firms/business persons include strong friendship relations. Also, four out of ten contain commercial ties that are substantively socially embedded in friendship ties, making them into strong personal-business ties. Although the Lammhult overall business community is far more heterogeneous than the one in Anderstorp, the portion of relations including taking advice from others (professional) is as high in the industrial-district community, in the furniture industry considerably higher. However, when we asked for new business opportunities mediated by business partners

and vice versa, i.e. opportunities mediated to local colleagues (cf. the Appendix), only a few cases were reported. This suggests that trust is personal indeed and that direct relations are important when it comes to enacting new business opportunities (Uzzi 1996, 1997).

Table 7. Relative relevance of single-stranded and socially embedded relations in Lammhult (%)

Relation Characteristic	Anderstorp (67 firms)	Lammhult (29 firms)	Lammhult (9 furniture firms)
Friendship	29.3	41.3	56.5
Business	49.0	32.3	39.1
Personal-business	n.a.	20.5	39.1
Professional	38.8	38.4	50.0
Complex	13.7	13.6	21.7

Note: For definitions, cf. Table 2 and the text.

4.3 Second-order embeddedness

In next page, table 8 presents average data for the firms/business persons as regards networking with the 20 economic institutions in Lammhult. While the average activity in the network is quite low, especially as regards business exchange, the data also suggest that existing acquaintances are used for exchange of experiences, through both general talk and more qualified problem solving. The second data column e.g. reports how many personal acquaintances (1.0) with representatives for economic organisations any pair of business persons shares on the average. Institutions, which in this respect are important as meeting places, include the regional development agency, the local school, and the municipal authorities.

Table 8. Lammhult Entrepreneurs/business networking with economic associations (mean values)

Relation characteristic	Average networking by firms	Averaged shared relations
Acquaintance	2.9	1.0
Talk	2.3	0.7
Business	0.7	0.1
Problem solving	2.4	0.5
Projecting	0.8	0.1

In a similar way Table 9 reports from the business persons' involvement in the social institutions in Lammhult. On the average they are members of more than three associations and obviously these associations offer

significant arenas for building new networks between business persons. While the average numbers remain quite small, it has to be kept in mind that individual associations beside the all-embracing trade association may play an important role, e.g. Rotary with 9 members and the sports association with 7 (out of 29).

Table 9. Lammhult entrepreneurs/business networking with social associations (mean values)

Relation characteristic	Average networking by business persons	Average shared relations
Membership	3.2	1.0
Entrustments	1.2	0.1
Business exchange	2.1	0.3

Table 9 also reports that business persons on the average share one association for meeting with local colleagues. Although this does not sound very impressive, the additional arenas provided by social institutions may be crucial in the overall local networking. That brings us to our findings concerning third-order embeddedness.

4.4 Third-order embeddedness

In the Lammhult commercial network all firms are directly or indirectly related networks (in graph-analytical language they make one 'component'). However, in spite of this a number of firms in Lammhult are not commercially directly related. There may be several reasons for this lack of (direct) business ties. The owner-managers may for some reason not yet be on speaking terms or they may not have reflected enough on potential joint business opportunities. Then the 'neutral arena' of an institution may trigger business exchange. The most advanced way of socially embedding a business community in a locality in our mind thus appears when the institutional setting itself takes on the role as a mediator between firms and their co-ordinators.

In order to explore the potential for 'institutional bridging' we investigated to what extent local business persons who are not commercially linked are members of *both* the same social *and* the same economic specific institutions (one or more of each), cf. Figure 3.

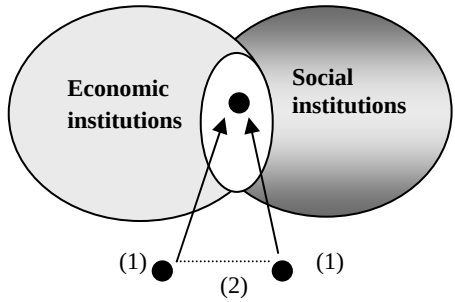

Figure 3. Economic and social institutions as bridges in the business network

Notes:

(1) Existing joint relationship via economic institutions and/or social clubs.
(2) Potential business relationships.

The indicator for presence on the economic-institution arena is using it for problem solving, for the social arena that the businessperson states that s/he usually meets other local business persons there. Our calculations - see the Appendix B for details - show that shared ties/meeting-places into the social and economic institutional setting make 21 out of 35 (i.e. 60%) business persons, who in the business network are commercially (directly) disconnected, directly related. This finding demonstrates the importance of third-order, institutional, embeddedness.

5. Conclusions

The inquiry into the notion of social embeddedness of economic activity has found that our conceptualisation of three different layers or 'orders' of embeddedness and associated operationalisations have helped us reveal different interactive phenomena in a small firms community. The basic argument is that business persons, especially entrepreneurs and small-business owner-mangers, build personal networks where individual ties combine calculative and social concerns (first-order embeddedness).

We have also illustrated the network effects in an industrial-district context when separating between core industries (in Lammhult the furniture industry) and auxiliary/supplementary industries. This may be associated with 'embeddedness' as well but since we focus on aspects of embeddedness, which combine structural and substantive dimensions, such sectorial organising is not further elaborated upon. Obviously formal economic and social institutions directly (second-order embeddedness) and indirectly (third-order embeddedness) organise business activities, both those of individual firms and those of the small-firm cluster at large. We propose that all organised activities, whether formally organised in firms or

economic/social institutions, add to the creation of a self-organising locality. While the ideal industrial district hosts a small-firm cluster that itself reaches the critical mass needed for self-organisation (Johannisson 2000), small communities such as Lammhult become especially dependent upon supplementary formal structures.

As much as new ventures emerge out of personal networks, we argue that institutions literally are the outcome of social processes. We thus assume that the rules governing the exchange and information diffusion between firms, as well as between them and formal institutions, emerge out of informal institutions that reflect the local culture. This may be addressed as 'fourth order' embeddedness. Figure 4 graphically summarises our different images of embeddedness that present the core industry as enclosed in different layers of formal and informal institutional textures. Further theorising and elaboration of methodology are needed to incorporate the cultural layer in making local business activity intelligible.

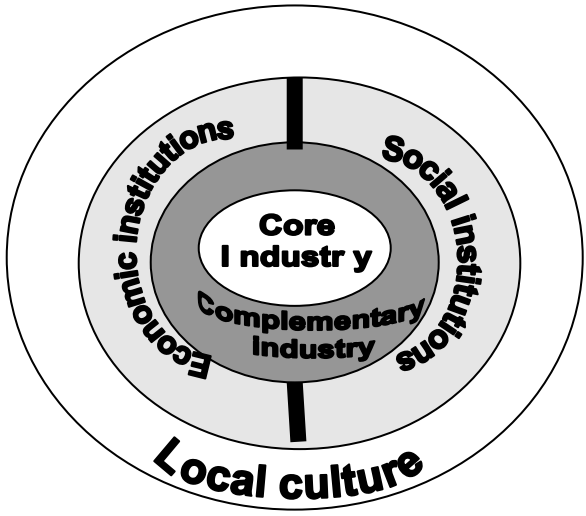

Figure 4. Economic, institutional, and cultural embeddedness

Although we have adopted a analytical tool feasible for studying complexity, the data we have got do not lend themselves to inquiry into dynamics of singular relations, let alone the detailed self-organising processes that the dense Lammhult networks may trigger. It remains an empirical fact though, that the community, in spite of its limited industry, generally and also in its core furniture industry, demonstrates impressive collective self-confidence, will and ability to enact a vision that expands far beyond the community itself: the making of the virtual organisation 'The Kingdom of Furniture'. We

have indicated above that active institutional exchange may make up for this drawback in terms of size and variety. Other possible explanations for the unprecedented 'flow' achieved in Lammhult are visionary business and community co-ordinators as well as co-ordinated economic and social institutions. Research into these issues is in progress.

Although limited, our insight into the non-local, i.e. global, networks of the furniture firms confirm that they are advanced both with respect to how far they reach and what agents they include. The combination of dense local networks, building an absorptive capacity for external influences through any member business, and globally significant firms provides competitive strength to all individual firms as well as to the (business) community at large. Our findings also demonstrate that, due to multiple networking, ‘structural holes’ (Burt l992) in the local business-to-business network may be bridged by second- and third-order embeddedness. Thus, in spite of the fact that the Lammhult business system at large and its individual (furniture) firms may appear as minor players on the market, their local institutional embeddedness amplifies local capabilities into collective entrepreneurship.

Contrasting Camagni (l991) as a representative of the GREMI group and the 'milieu/innovative networks' approach, we thus argue that dense social embeddedness neither has to create a lock-in, nor reduce global competitiveness. Entrepreneurship is about the commercialisation of innovations, whether technical or social. Our own research into a traditional industrial district and a science park not only shows that the low-tech industrial district is much more densely networked but also that its member firms are as internationally oriented as the high-tech science park inhabitants (Johannisson *et al.* 1994). The industrial district can probably compensate for its technological handicap by a deeper local embeddedness, reflecting a higher social innovative capacity.

Embeddedness appears as a dynamic phenomenon that calls for further qualitative research approaches. The role of the local culture in the embedding institutions is such a challenging study that calls for historical and ethnographic research. This by no means implies a one-sided belief in path dependence; our network approach also opens up for development patterns that turn out to have been initiated by chance events, which the dense networks have amplified. Also, comparative research between localised firm clusters may shed more light on the dynamism of embeddedness and the importance of local networking for economic and social development. The findings presented here and additional studies using the same approach would provide insights also interesting for practitioners. Already the findings

presented above suggest at least three strategies available for enhancing learning capabilities: addressing individual firms with formal knowledge through economic institutions; create meeting places for exchange of experiences between peer business persons; and mediating further expertise through different networks. Specifically practitioners in the public business and regional support structure can use the network technique adopted here to audit the networking of individual firm and of localities as such. As much as a healthy firm network is operated systematically locally as well as globally, a healthy community nurtures both internal and external networks thereby practicing a 'glocal' strategy.

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Appendix 1.

Operational definitions of network strands

The following appendix includes the adopted operational definitions of single-stranded ties in business-to-business, business-to-economic institutions and business-to-social association networks.

Strands	Operationalisation
(a) Business-to-business networks	
Awareness	The firm and its operations are known.
Acquaintance	The CEO or anyone else in senior management and on the board of the firm is personally known.
Talk	A face-to-face or telephone meeting was held with the senior management of the firm over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than the weather.
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the firm over the last nine months.
Professional (asymmetrical)	The staff of the firm is approached if an ingenious or challenging problem turns up.
Joint development project	Over the last three years there has been a partnership involving the firm and aiming at joint development, of for example, technology or markets.
Provided business contacts	The firm has been recommended to own existing business contacts, e.g. customers or suppliers.
Received business contacts	The firm has mediated new business contacts, e.g. customers or suppliers.
Children's schoolmates	Management's children are in the same class at school.
(b) Business-to-economic institutions networks	
Awareness	The firm and its operations are known.
Acquaintance	Somebody in the management of the institution is personally known.
Talk	A face-to-face or telephone meeting was held with a representative of the institution over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than weather.
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the institution over the last nine months.
Problem solving	The staff of the firm is approached if an ingenious or challenging problem turns up.

Projecting	Involvement in the institution with a development project over the last three years.
Provided business contacts	The institution has been recommended to own existing business contacts, e.g. customers or suppliers.
Received business contacts	The institution has mediated new business contacts, e.g. customers or suppliers.
(c) Business to social associations networks	
Member	Being a member of the association.
Family member	Any other family member being a member of the association.
Entrustments	Being entrusted an administrative task in the association.
Local business exchange	Meeting with local business colleagues at different events organised by the association.
Global business exchange	Meeting with non-local business colleagues at different events organised by the association.

Appendix 2
Embeddedness: matrix approach

First-order embeddedness

Relations between firms are described by the adjacency matrix A with elements

$$a_{ij} = \begin{cases} 1 \text{ if firm i has a relation with firm j} \\ 0 \text{ otherwise} \end{cases}$$

The figures in Table 5 are based on mutual (reciprocated) relations. The maximum possible number of mutual relations are $\binom{n}{2} = n(n-1)/2$, where n is the number of firms.

This gives e. g. 406 possible mutual relations among the 29 firms in Lammhult out of which 235 are realised by acquaintance and/or talk and/or commercial and /or professional relations. The number of realised relations is the basis for the figures in Table 6.

Example: We have 97 mutual relations among the 29 firms in Lammhult, which according to our definition can be described as friendship. This gives the percentages 97/406 = 23.9 and
97/ 235 = 41.3, respectively.

Second-order embeddedness

Relations between firms and economic institutions or relations between firms and social institutions can be described by a 2-mode or an affiliation network. See Wasserman and Faust (1994, chapter 8). The basis for the analysis is now the affiliation matrix A with elements:

$$a_{ij} = \begin{cases} 1 \text{ if firm i is affiliated with event j} \\ 0 \text{ otherwise} \end{cases}$$

Denoting the transpose of A as A^T, the matrix $X = AA^T$ is a valued matrix indicating the number of events jointly attended by each pair of firms/businessmen.
Of special interest is the diagonal entries of X counting the total number of events attended by each firm/businessman. By dicotomising X we obtain a matrix with elements:

$$x_{ij} = \begin{cases} 1 \text{ if firms i and j jointly attends at least one event} \\ 0 \text{ otherwise} \end{cases}$$

The figures in the second column of Tables 7 and 8 are based on the diagonal elements of X and the figures in the third column are based on the off-diagonal elements of X, expressed as percentages.

Third-order embeddedness

The analysis is now based on the following three matrices:

1) The adjacency matrix A describing relations between firms.
2) The dicotomised affiliation matrix X_E describing relations between firms and economic institutions.
3) The dicotomised affiliation matrix X_S describing relations between firms and
social institutions.

We can in each one of the matrices above encounter three types of relations: symmetric, asymmetric or no relation between each pair of elements. This gives us 27 possibilities to describe third-order embeddedness in this case.

Example: Let A be the adjacency matrix associated with the strand Commercial in Table 2, and let X_E be the dicotomised affiliation matrix associated with the strand Problem solving in

Table 3, and let finally X_S represent the strand Business exchange in Table 4.

Looking at the 29 firms in Lammhult, and restricting ourselves to symmetric (mutual) problem solving and business exchange relations, we obtain the following numerical results.

Step 1: Problem solving 121 and business exchange 114 mutual relations.
Step 2: Problem solving and business exchange 35 mutual relations.
Step 3: Commercial relations: Symmetric (mutual) 7
Asymmetric 7
No relation at all 21

Despite the fact that 35 pairs of businessmen have mutual relations when

it comes to problem-solving and business exchange 6.

Paper II

Theoretical and methodological challenges bridging firm strategies and contextual networking

by

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0. Abstract

There is an increasing concern for, on one hand, networked business strategies and, on the other, the competitiveness of localized small-firm clusters. Scholars and practitioners seem to be equally intrigued. This paper first reviews different strategy frameworks – resource-based, industrial organization, virtual organization and industrial district from a network perspective. Eleven generic dimensions of such strategic frameworks are generated and operationalised. Then graph analysis is used to map a small firms cluster in which furniture manufacturing and retail make up the core industry sectors. Three centrally positioned firms in the local business networks are identified and face-to-face interviewed. The owner-managers where asked to map their conceptualisation and enactment of business strategy according to the operationalised-frameworks. The findings demonstrate that no single strategic framework can make the firms' strategic conduct intelligible. The use of advanced information technology ensures that all the three firms align to features associated with virtual organizing. The balanced used of strategies is assumed to add to the competitiveness of firm and local business-systems. The paper concludes with suggestions for further research and provides advice for practitioners.

Key words*: Strategy, small firm, spatial cluster, graph analysis*.

1. Introduction

In business-strategy research firms for a long time were analyzed as autonomous entities (Penrose, 1995; Gulati, Nohria and Zaheer, 2000). However, in the l990s there has been an emerging concern for studying firms as embedded in different contexts, e.g. (Nohria and Eccles, 1992; McEvily and Zaheer, 1999; Galaskiewicz and Zahher, 1999). Such contexts may be functionally (e.g. industry, business system), territorially (locally, regionally, nationally), or virtually demarcated. Although, different efforts have been made to determine how the strategy of a firm is contingent upon both its own and contextual resources, (Maskell, Eskelinen, Hannibalsson, Malmberg, Vatne, 1998), there has been no attempt to combine different theories and methodologies. Testing different theories can provide new patterns for research in the general strategy field (e.g. Pehrsson, 2000). Also, the combination of methodologies might provide a deeper analysis of the strategies that firms pursue (Borch and Arthur, 1995).

In this paper, strategy is conceived as the long-term direction of a firm. Strategy, however, results from a series of strategic behaviours within and between competitors, suppliers, customers, government institutions and private associations (Galaskiewicz and Zahher, 1999). We introduce locality within which to study entrepreneurial strategic behaviour. Within a localized business community, firm interaction built a collective capacity for entrepreneurship (Uzzi, 1996 and 1997; Johannisson 2000) Locality influences the way in which individual firms shape their strategy. Firms subsequently prioritize exchanges with local firms to gain their own advantages, while, at the same time they aim to contribute to the development of their community (Pyke and Sengenberger 1992; Bianchi 1998; Maskell *et al.* 1998; Johanisson 2000).

Here social network analysis provides a methodology to describe the context through a network. This analysis also allows one to relate a firm's adopted strategy to its position in the contextual network. A central position in a network indicates that the firm has the ability to influence a large number of partner firms. It brings the idea of a selective use of information, resources and competencies (Gulati, 1995). Network members that hold central positions are privileged with regards to building strategic alliances and joint ventures, i.e. managing the costs and benefits of belonging to a network (Gulati *et al.*, 2000). However, there is a need for additional research with respect to how central firms use their context to define network strategies and achieve profitability (Pehrsson, 2000). Our aim here is to combine different theories to study how firms build strategies and contribute to collective entrepreneurship in spatially demarcated business networks.

The paper is organized as follows. The next section summarizes the content and context approaches for business strategy, which jointly provide the conceptual basis for our empirical research. Then the research design and methodology are presented. In the fourth section we position and describe the small-firm spatial cluster being studied, then we report from exploratory case research into the strategy making of three firms which are centrally positioned in the local networks. In the concluding section, we indicate some lessons for researchers and practitioners.

2. Content and context approaches to strategy

In Table 1, we identify four networked frameworks for firm strategy by dichotomizing ascribed features along two dimensions. *The first dimension* concerns the classification of the theories according to basic conceptual assumptions associated with content and context. Content theories belong to the business strategy field and context theories appear in organizational and regional studies. *The second dimension* concerns the source of change triggering strategic initiative or re-action. The source may be either internal (inside-out) or external (outside-in). Internal triggering means e.g. utilizing unique competencies or launching radical innovation. External triggering of change means that the firm is assumed to efficiently cope with environmental challenges.

The two dichotomised classifications, when combined, provide four 'ideal' strategic perspectives. These are the resources-based, the industrial organization, the virtual organizations and the industrial district perspective or view. Within the resource-based perspective, the point of departure is the individual firm in the value chain. This viewpoint was chosen because it has lately been seen as a unifying framework in regional studies (Foss, 1999). In this approach, the resources and capacities of the firm determine its strategic actions, which in turn determine firm performance. The second viewpoint is the industrial organization, which demonstrates that the market structure determines firm strategy and, accordingly, performance.

The virtual-organization perspective was included because of the relevance of information technology in the knowledge economy (Norman and Ramirez, 1994; Hedberg, Dahlgren, Hansson and Olve, 1997). This approach argues that producers and customers jointly generate value. The industrial district model was considered because of the re-emergence of the business communities around the business world (Storper, 1995; Porter 1998). The industrial-district view associates competitive advantage with membership of a localised and socially embedded cluster of small firms (Johannisson,

Alexanderson, Nowicki and Senneseth 1994). Each framework will be briefly commented upon based on some of its main assets.

Table 1. Alternative images of strategy

Dimension	Inside-out	***Outside-in***
Content	Resource based view R&C* → Strategies → Performance	Industrial organization MS** → Strategies → Performance
Context	Virtual organization R&C* → Strategies → Perrformance	Industrial district MS** → Strategies → Performance

Notes:

* R & C = Resources and capabilities.

** MS = Market structure

2.1 Resource-based view

The resource-based view, founded by Penrose (1995), assumes that the firm controls unique resources and capabilities (Barney, 1991; Wernerfelt, 1984). These resources are e.g. physical, human, organizational, and locational (Hall, 1993). Firms are expected to combine these resources into special, heterogeneous capabilities (Fahy, 1996; Foss, 1999; Grant, 1991). Functional, cultural, positional or regulatory differentials pressure firms to constantly innovate (Hall, 1993; Peteraf, 1993). Firms sustain their competitive advantage by establishing their strategic actions on domains where their competitors cannot imitate their resources and capacities (Barney, 1991). That is the firm concentrates in the development of in-house capacities (Grant, 1991). To map firm strategy according to this approach, we must understand the relationship between resources and capabilities as sources of uniqueness and generators of success.

2.2 Industrial organization

Firms as autonomous entities strive for competitive advantage by establishing a unique position in the industry (Porter, 1980; 1985). Within an industry, firms should analyze the sources of entry barriers, buyers, suppliers, substitute products, customers and competitors to obtain market power (Porter, 1996). In this view, the industry strongly influences the strategic choices made by firms (Porter, 1981). Competitive advantage originates in diversification, sales promotion, product differentiation and interfaces along the value chain (Rindova and Fombrun, 1999). To map firms according to

this approach, we must focus on the interdependencies between the market structure, the actions to improve or obtain a position on it and performance.

2.3 Virtual organization

Virtual organizations are constituted by a network of independent, yet interdependent firms, which strive for joint variety and dynamism (Whether, 1999). The inter-linked firms making the virtual organization share a common identity and vision (Bultje and van Wiljk, 1998). The strategy is highly driven by continuous development and recombination of joint core competencies. Partner firms rely on mutual trust and transparency and they share risk (Hedberg et al, 1997). Firms strive to flexibly create offerings in terms of superior products or services based on each customer's specific needs (Whether, 1999). That is they are opportunity oriented firms in value constellations together with customers co-create value (Normann and Ramirez, 1994). To satisfy their customers, firms combine cost efficiency and product uniqueness without regard to organization size, geographic location, technology or process required (Bultje and van Wiljk, 1998). Strategy making requires agility and coordination of core competencies necessary to quickly bring a product/service to the market (Hedberg *et al.*, 1997; Franke, 1999). Adopting this view, we try to map the relationships between core competencies, customers' satisfaction, and information technology, and performance.

2.4 Industrial district

Industrial districts are defined as spatial systems of small firms specialized by product type, product components or product phases (Bianchi, 1998). Firms are vertically, horizontally as well as laterally organized implying both cooperation and competition (Johannisson, 2000). Relations between firms, regional institutions, universities and research centres as well as social embeddedness create this special context of co-opetition (Becattini, 1998; Pyke and Sengenberger, 1992). The locality offers individual member firms access to resources as well as to new information, ideas, and opportunities. In the industrial district, firms flexibly specialize and learn interactively (e.g. Johannisson, Alexanderson, Nowicki and Senneseth, 1994). Within this framework we must perceive firm strategy as reflected in the systematic local exchange with firms, institutions, and society. That interaction defines as much individual firm performance as the overall progress of the community.

3. Methodology

This paper is an exploratory study in which we study the interactions between firms within a local business community (Lammhult) using survey data. Then, we identified the network and, select centrally positioned firms

for obtaining supplementary data on enacted strategies with social network techniques (Wasserman and Faust, 1994). The social network analysis is carried out using the UCINET V computer package (Borgatti, Everett and Freeman, 1999). The second part of the empirical study includes structured interviews with the business co-ordinators in three highly networked local firms.

In order to solve our research question we have to deal with four methodological subtasks:

- present the empirical base, i.e. industry in Lammhult ;
- describe localized small-firm cluster as networked settings;
- identify firms with central positions in the small-firm cluster and their background data;
- operationalise the proposed business-strategy frameworks; and
- identify criteria for linking network position and strategy approach(es).

3.1 The empirical base: the Lammhult

Lammhult is a small community with about 2,000 inhabitants located half an hour's drive north of the regional centre Växjö in Southern Sweden. In Lammhult, there are about one hundred businesses, whereof the 29 larger ones are organized in a local business association. As proposed by Johannisson (Johannisson *et al.*, 1994), such local small firms clusters is deeply embedded in the civic society. Together these 29 firms employ about 600 persons, the largest one about one hundred. The remaining local companies, most of them in trade and private services, provide another 100 jobs (besides the 250 jobs in the public sector). The local trade association is very active and is enacting the notion of 'The Kingdom of Furniture' including the local 9 furniture companies as the core of a regional network of firms. This initiative, as well as other local activities, has considerably vitalised the community over the last five years.

Lammhult was chosen as the site of study because of our privileged access to the businesses and local organisations/institutions. The firm study concerns the 29 members of the local trade association. Another regional cluster, only used for comparison, consists of 52 firms in the electronic industry in the Kronoberg County. In Lammhult, a representative for the regional development agency collected the data. In the electronic industry, Master students at Växjö University collected the data. A questionnaire concerning different relations to fellow firms was administered in each cluster 29 firms completed all questions in both clusters (which means that there was no non-response in Lammhult!).

3.2 Describing localized small-firm cluster as networked contexts

When we describe localized business networks we follow a methodology, which has been adopted in previous empirical research (e.g. Johannisson *et al.*, 1994). Strands building dyadic relationships between firms/business co-ordinators are identified as follows:

Table 2. Defining strands in networks of agents in localized clusters of firms

Social Relationships	
	Operationalisation
Strand	
Talk	A face-to-face or telephone meeting was held with the senior management of the firm over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than weather.
Acquaintance	The CEO or anyone else in senior management and on the board of the firm is personally known
	Business Relationships
	Operationalisation
Strand	
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the firm over the last nine months.
Professional	The staff of the firm is approached if an ingenious or challenging problem turns up.

Each organization was faced with "yes or no" questions about their relations to the other local business co-ordinators/firms resulting in a number of adjacency matrices with (in both the Lammhult/electronic cases) 29 rows and 29 columns.

3.3 Identify firms with central positions in small-firm cluster and their background data

Estimating the centrality of the position of a firm in the networks, we use three measures: degree (number of dyadic relations to others), closeness (direct and indirect relations to others), and betweenness (gatekeeping role), cf. Appendix A. The three most central firms were selected, one firm being central in the overall local business system, the other two in the furniture industry. This heuristic selection process was based on the firms' ranking on

all three indicators of centrality in the acquaintance, talk, commercial, professional strands of the business-to-business network, cf. appendix A, p. 14. The appendix A also includes the detailed explanation of the rank estimation. The interview also included a number of background questions about the firms. In Appendix B the three firms are identified in the local commercial furniture cluster.

3.4 Operationalising the four business-strategy frameworks

To operationalise the four strategy frameworks we identified a number of concepts that represent assumed shared features of strategy. These elements concern production, product, suppliers, customers, competitors, business relationships, institutions, society and learning competencies, altogether 11, cf. Table 3. The conceptualisation provided by each strategy framework, cf. above, guided the operationalisation of each dimension. We described each one of them by way of statements reflecting 11 proposed dimensions constituting strategy, namely (in the order presented to the interviewed business co-ordinators):

Table 3. Operationalised strategy elements

1.	The production and the product(s);
2.	Coping with customers;
3.	Acquiring new customers;
4.	Coping with competitors;
5.	Coping with suppliers;
6.	Acquiring new suppliers;
7.	Defining the quality of a business relation;
8.	Learning and competence development;
9.	Relate to organisations/institutions;
10.	Relate to society at large;
11.	Stating the business concept.

Altogether 44 statements were thus constructed (four strategy frameworks, 11 dimensions each). The detail statements for each concept are included in appendix B. Each statement was written on a card and for each strategy dimension the interviewed business co-ordinator was asked to rank-order the (four) statements/cards. None of the business co-ordinators had any problems ordering the four cards (albeit the fact that we related the recruitment of new customers directly to profitability made them hesitate). The overall strategic orientation of the firm was identified in two ways, both according to what strategy was favoured and with respect to the overall ranking across all dimensions. In the former case the maximum score for any particular strategy framework was eleven. In the latter case a strategy got 4 ‘points’ if ranked

first and 1 if ranked fourth. The maximum score for each strategy framework thus is 44.

3.5 Identifying criteria for linking firm centrality and adopted strategy framework

Since the most central firms in the overall local industry and the furniture industry in the Lammhult cluster were studied, we expected the industrial-district strategy to dominate, cf. our basic proposition. Further interpretations were made in an explorative mode, searching for patterns.

4. Findings

In next page in table 3 we provide network data concerning the Lammhult business community. As the table demonstrates, all the firms in our population provided data on their local networking behaviour as regards other local firms (the study also included data on relations to social associations and economic organizations/institutions. The table presents network-density data, i.e. what portion of all potential dyadic relationships between firms – 29(29-1)/2 or 406 - is being realised in any or several of the local networks. Also, as a base for comparison business-network data concerning Anderstorp in the Gnosjö industrial district, also in Southern Sweden, and, as indicated, the electronic industry in the Kronoberg County, are provided. For example, the Lammhult network data indicates that 26.8 percentage of total possible talk relationships in the network are realised. 46.8 percent of the total possible acquainted relationships are taking place while 18.7 percentage of all possible business exchanges are being done in the community. This numbers reflect that Lammhult is an active networking-community.

If the data of this network is compared to the data of the other networks, it can be observed that Lammhult outstands in all network features. The Lammhult industry is obviously densely networked, far more so than the industrial-district community and the electronic industry. Possible explanations include, as regards comparison with Anderstorp, that the latter cluster is much larger, and, with regard to the electronic cluster, that the member firms only share the same location. This has never been publicly addressed as a socio-economic unit. In spite of also shared technology and shared markets they only appear as an aggregate of independent firms. In Lammhult, in contrast, different measures have been taken, both spontaneously and intentionally through private and public mobilisation, in order to activate the linkages between the firms and between them and other social and economic institutions.

Table 3. Network density (%) in three localized business networks

Business network (1)	*Talk network (2)*	*Acquaintance network (2)*	*Commercial network (2)*	*Professional network (3)*
Anderstorp (Gnosjö industrial district) (138/67) (4)	10.1	31.3	14.4	13.8
The Kronoberg electronics cluster (29/52)(5)	2.0	4.0	3.0	-
The Lammhult cluster - total (29/29)(6)	26.8	46.8	18.7	15.3
The Lammhult cluster – furniture subcluster (9/9) (6)	47.2	63.9	25.0	22.2

Sources: primary data (Johannisson *et al.*, 1994)

Notes:

(1) The first figure refers to the total population, the second the number of respondents as regards network data.
(2) Concerns symmetric ties, i.e. both respondents in each dyadic relation have confirmed the relationship.
(3) Concerns all directed ties, i.e. either or both agents in a dyadic relations have reported the other one as a potential problem solving.
(4) Concerns the Anderstorp community within the Gnosjö industrial district l990.
(5) Data from 2000
(6) Data from l999.

4.1 Business strategy in a networked local context

We thus approached three firms to research adopted business strategies, here addressed as Plastics, Component and WellDesign. All of them are members of the core furniture cluster; the two first mentioned have about 30 employees while WellDesign is the largest firm in Lammhult with almost 100 employees. The three firms all use advanced information technology and nurture the ambition to grow, albeit the smaller ones only slowly.

Plastics, was established in l946 and is now managed by the founder's son. In 1982 he sold the company to a regional group staying as the CEO. He is presently planning for an expansion of the business, especially on international markets (1999 the export share was 18%). The plastic details offered the business market includes both own products and traded details. Local customers represent 3% of the turnover, regional ones another 32%; regional suppliers are important as well. Plastics is central in the overall local business network.

The second company, *Component*, is well integrated and central in the local furniture industry; the largest local customer (WellDesign) represents 45% of sales. 60% of the material used is tailor-made components. The two partners, who bought the company in l981 (for a period it was owned by a regional investment company), from the very beginning enacted the vision to become a highly specialized subcontractor using the most advanced technology available in the market. Component was among the first five companies in the Swedish furniture industry, which invested in NC-machinery.

The third company, *WellDesign*, is one of the most well-known furniture companies in Sweden, recognized for its exquisite design and high quality furniture for public settings. The then second-generation family business, founded in l945, in the mid-nineties was acquired by a public company. Today (2000) WellDesign has grown considerably over the last few years and the export share is 60%. In addition to this organic growth it recently acquired another high-quality furniture company in a neighbouring region, which increased the overall turnover by 25%. Two thirds of the production value consists of contracted special components which trough a very advanced design concept, are flexibly integrated into advanced products. Most subcontractors are located in Lammhult or in the surrounding region. WellDesign provides its (potential) customers (often architects) with a CAD-system on the web that considerably increases variety and reduces logistical costs.

The strategy-profile analysis of the three firms provides a number of interesting findings, cf. Table 4. First, no single strategy (framework) is able to fully catch the strategic behaviour of the three firms. Possible explanations for this include theoretical and methodological concerns. First, the adopted strategy frameworks are either developed with large firms in mind (Resource-based and Industrial organization) or are still conceptually underdeveloped (Virtual organization and Industrial district). Second, each framework seems to be contaminated with normative elements, which generally creates problems in descriptive research.

Third, our general networking model may favour some frameworks and disfavour others. Fourth, our ‘operationalisations’ of each strategy’s ascribed core features may be are inappropriate. Fifth, our rather brief interviews with the business co-ordinators (about one hour each) may not have uncovered important contextual facts.

Table 4. Strategy-making in networked local firms

Firm	*Resource-Based firm*	*Industrial organization*	*Virtual organization*	*Industrial district*
Plastics	2/30	3/24	4/31	2/25
Component	4/30	1/24	5/32	1/24
WellDesign	1/25	4/28	3/29	3/28
Total	7/85	8/76	12/92	6/77

Note: The first figure concerning the individual firms tells in how many dimensions (11) the strategy framework ranked first out of the four, the second figure how the overall choices (representing altogether 110 'points' distribute over the four strategy frameworks.

A second finding is that the inside-out strategies (resource-based and virtual organisation) dominate, together getting 19 out of 33 first choices and 187 out of 330 as the overall score. This is probably the outcome of entrepreneurial leadership. Third, there is little difference between the three companies with regard to strategic practices and conceptualizations although the importance of the local market differs radically between them, on the input side or the output side or both. The appreciation of virtual strategies in all three companies rather suggests that opportunities and required resources are independent of both ownership and place. Fourth, WellDesign, which uses advance information technology for global marketing, also employs the most traditional strategy (industrial organization) to create and sustain competitiveness. The old and new economies appear to go hand in hand in this firm.

5. Conclusions: challenges for academia and practice

The Lammhult cases suggest that the strategy view of individual firms encompasses ideas associated with all four proposed strategic frameworks. By testing different theories and combining (albeit only exploratory) methods, we have substantiated the general argument that firms uses different approaches to set their strategies according to context (de Wit and Meyer, 1998). Previously attempts to provide conceptual variety have been more restricted. Pehrsson (2000) combines industrial organization and resource base as key drivers of long-term profitability at the firm level. Porter (1997 and 1998) in his writings on creating competitive advantage at the national level, includes localized small-firm clusters as contributors to national strategies; Foss (1999) tries to bridge the resource-based view and the industrial-district perspective. Vanhaverbeke (2000) applies a virtual-organisation perspective on a regional 'construction and home furnishing' cluster. Baptista and Sawnn (1999) combine industrial organization and

regional development to explain dynamics processes of innovation. We argue that the under-theorized field of small-firm strategy calls for an even broader theoretical platform that trades upon all four frameworks presented here.

In Lammhult, firms have collectively generated an 'absorptive capacity' due to tense networking (Cohen and Levinthal, 1990), which means that the individual firms can benefit from the learning capabilities from the neighbours. Networking also means that 'strategic awareness' (Gibb and Scott, 1985) associated with individual firms behaviour, in favourable settings such as the Lammhult one, may create, 'territorial awareness'. This suggests that individual firm can imagine what effects external changes will have, not only on their own operations but also on those of neighbouring local firms. The facts that the most central firms in Lammhult are also the fastest growing and most profitable ones suggests that these firms have managed to make such a collective localized features instrumental in their own entrepreneurial endeveaours. However, further research is needed to identify efficient ways for firms as well as regions to build on and exploit glocal strategies- i.e. local co-operation for global competitive advantage.

The empirical findings suggest a requirement for some practical advice for both individual firms and regional stakeholders. Advanced use of information technology in the current turbulent times does not exclude the need for close, face-to-face personal contact. Entrepreneurial learning is to a great extend social and experiential, and innovation is often an outcome for close and frequent interaction with potential consumers. Thus becoming involved locally in social and business exchanges is helpful to almost any firm.

In the consolidated industrial districts, business and community development is the outcome of collective self-organizing processes. The dense networks among the Lammhult firms have also triggered important mobilizing efforts, particularly orchestrated by a 'community entrepreneur'. However, there are presumably many localities that, in contrast to the Lammhult setting, need qualify external support. The lesson to be learnt from our study for those involved in such policy implementation is that collective support, rather than individual firm subsidies, should be offered. This may for example, mean encouraging emergent local alliances between firms or providing an infrastructure that build identity and creates attractiveness. Whatever concrete measures taken, it is very important that existing firms should be invited to participate. Established entrepreneurs have a need to play a part in their context. Usually they have competencies and commitment that go beyond their own commercial operations. In Lammhult the local business association supports the local restaurant and has, jointly with local and regional authorities, organized a knowledge creation programme that involves a large proportion of the local labour force.

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Appendix A

Centrality measures

In order to locate the most prominent actors in a network a large number of definitions of centrality has been proposed. We shall use the centrality measures: degree, closeness and betweenness. See e.g. [30, Chapter 5, 46]. These centrality measures are also provided as output from network computer packages, such as UCINET V. The following are the definitions we considered in our estimations.

- **Degree**

The number of vertices adjacent to a given 'u' vertex in a symmetric graph is the degree of that vertex. For non-symmetric data the in-degree of a vertex u is the number of ties received by u and the out-degree is the number of ties initiated by u.

- **Closeness**

The farness of a vertex is the sum of the lengths of the geodesics (shortest paths) to every other vertex. The reciprocal of farness is closeness centrality.

- **Betweenness**

Let bjk be the proportion of all geodesics linking vertex j and vertex k which pass through vertex i. The betweenness of vertex i is the sum of all bjk where i,j and k are distinct and j<k. Betweenness is therefore a measure of the number of times a vertex occurs on a geodesic.

We used the following approach in order to identify the most important firms/businessmen in Lammhult.

Step 1: Rank all firms according to degree, closeness and betweenness.

Step 2: The procedure at Step 1 is applied to the strands: acquaintance, talk, commercial and professional.

Step 3: The most highly ranked firms/businessmen are presented in the following tables (for integrity reasons only numbers are presented):

- **Overall local business system**

Strand	Centrality		
	Degree	**Closeness**	**Betweenness**
Acquaintance	26,5,10	24,14,7	10,2,3
Talk	7,12,2	10,2,7	7,12,24
Commercial	10,9,2	28,2,9	10,9,2
Professional	10,26,9	10,26,9	10,26,9

- **Furniture industry**

Strand	Centrality		
	Degree	**Closeness**	**Betweenness**
Acquaintance	16,22,24	16,22,24	16,22,24
Talk	16	16,22	22,25
Commercial	22	22	22,16
Professional	16,24,28	16,28	24,28

Step 4: The final choice of the most important firms/businessmen with respect to all four strands and all three centrality measures was based on non-mathematical arguments.

Appendix B

Structured Interview

1. The Production and Product(s)

Strategy approach	How would you characterise your production facilities/ (main) product
IO	My product is considerably better than those of our competitors
RB	We have a qualified production system that can not be copied easily
ID	Jointly with other firms in the region we have a production capacity which is very interesting for customers
VO	Our product is highly specialized and adapted to different customers needs

2. Acquiring new customers

Strategy approach	What are the criterions for approaching new customers?
IO	Profits can be improved by increasing volume, creating a new market or minimizing costs
RB	Profits can be improved by more efficient use of resources, techniques and process
ID	Profits can be improved by taking advantage of the local supply networks
VO	Profits can be improved by challenging learning opportunities and access to new resources, techniques and technology

3. Coping with customers

Strategy approach	What is your attitude towards the firm's customers?
IO	Demanding, there is always a threat that we can satisfy
RB	Sparring partner, it keeps us improving our techniques and resources
ID	Like between brothers and sisters, we pick on each others but stick together as regards others
VO	Speeding up, they actively contribute to making the value we create for them

4. Acquiring new suppliers

Strategy approach	What is the criterion for co-operate with a new supplier?
IO	Improve market position
RB	Improve own internal resources or techniques
ID	Include a competent supplier who is personally and locally well known
VO	Obtain globally valid competencies and general trustworthiness

5. Coping with suppliers

Strategy approach	What is your image of the competitors of the firm?
IO	Develop and enforce the position in the market
RB	Develop in-house resources in order to keep the lead as regards unique techniques and processes
ID	Develop of the own business by getting involved in the local business community
VO	Develop products and competencies through co-operation with many partners

6. Coping with competitors

Strategy approach	What is your image of the firm's competitors?
IO	Represent threats
RB	Useful for benchmarking in order to enhance own competencies
ID	Contestants, i.e. also in a way collaborators creating markets for us
VO	Potential partner

7. Relate to organizations and institutions

Strategy approach	What is the role of private and public organization and institutions form the point of view of the business?
IO	Creates order and provides information of the market
RB	Provide information of techniques or supplementary resources for free or at a reduced rate
ID	Enforce existing networks
VO	Provide arenas for learning and additional business opportunities

8. Relate to society at large

Strategy approach	In the society at large, what is the responsibility of the firm?
IO	Ethical conduct and actively contribute to make new collaborations
RB	Nurture the own, professional competencies
ID	Actively contribute to the local community at the firm's location
VO	Appreciate and develop human resources and promote knowledge transmission

9. Learning and competence development

Strategy approach	What is your view as regards firm competence and learning?
IO	We continuously watch the actions of our competitors
RB	We try to develop the very best techniques and methods that can not be easily copied
ID	With other firms in the region we try to jointly develop advanced.
VO	With our business partners, suppliers and customers, we advance our qualifications using IT

10. Defining the quality of a business relation

Strategy approach	What is a 'good' business relation in your mind?
IO	Focussed, explicitly negotiated and preferably formally enacted
RB	Contribute to develop special in-house techniques or processes
ID	Mutual concern as regards the parties concerned
VO	Mutual confidence

11. Stating business concept

Strategy approach	How would you state the business concept of the firm?
IO	Develop and enforce the position in the market
RB	Develop in-house resources in order to keep the lead as regards unique techniques and processes
ID	Develop of the own business by getting involved in the local business community
VO	Develop products and competencies through co-operation with many partners

Paper III

International trade fairs as amplifiers of proximity in clusters

by

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0. Abstract

Clusters are undergoing globalisation processes that are inducing transformations in their spatial spheres of interaction and collaboration. The aim of this paper is to contribute to this debate, exploring the role of international trade fairs (ITFs) for amplifying proximity in clusters. In this paper, a proximity framework is integrated to inquire how non-local foreign relations encountered at ITFs are inter-connected in a cluster network of multi-stranded relations. The cluster network depicts the multi-stranded relations in which the same firms are simultaneously 'embedded' for business and innovation purposes at three proximity orders. The first order, the intra-cluster proximity, concerns the overall local networking. The second order, the ITF proximity, comprises trans-national friendship relations, trans-national market relations, and trans-national partnerships instigated and sustained at the events. The third order, the holistic proximity, includes the cases in which firms engaged at ITFs interact with firms not participating at ITFs. This paper relies on a case study method according to which social network analysis serves to examine proximity in a Swedish cluster. The findings reveal that ITFs amplify the possibilities for inter-connecting local multi-stranded relations and trans-national relations. Participation at ITFs can potentially help firms to overcome the geographical limits of clusters.

Key words: international trade fairs, clusters, proximity, multiplexity, social network analysis.

1. Introduction

Clusters are currently coupled with globalisation processes that influence local business relations and collaborations. This issue has been related to an increased use of information and communication technologies (ICT) (Carbonara 2004, Torre and Rallet 2005), global oriented customers (Schmitz 1999, Humphrey and Schmitz 2002, Sturgeon 2002), relocation strategies (Biggiero 2006) and international trade fairs (ITFs). ITFs have been associated with clusters as part of the different activities prompting in clusters a local and global balance (e.g. Maskell *et al.* 2006). This relation to ITFs has been established without an understanding of how clusters use such events for establishing non-local foreign relations by means of a temporary geographical proximity, while revitalising relations characterised by a permanent geographical proximity. This paper tries to fill this gap. Prior research has acknowledged that cluster firms have engaged at ITFs in order to expand their spatial sphere of interaction (e.g. Giuliani *et al.* 2005, Reid *et al.* 2005). The importance of ITFs has been highlighted by the literature on entrepreneurship, geography, marketing and communication as well as international business (e.g. Alix, 1922, Donckels and Lambrecht 1995, Munuera and Ruiz 1999, Wilkinson and Brouthers 2000).

ITFs are those events that individuals, firms, and institutions attend temporarily to exhibit and trade products in foreign and national markets (Palumbo *et al.* 1998).[13] Business owners, managers, designers, production engineers and sales representatives commonly travel to ITFs in order to gather information, place orders and solve problems (Hansen 2004). At ITFs firms in the same industry, product line or product category meet in order to trade, search for and develop new or improved products. Firms monitor competitors' innovations and build relationships with potential partners located in different parts of the world (Seringhaus and Rosson 2001). They also meet with their customers, suppliers and colleagues to discuss their products and exchange information on the latest advancements of their industries (Florio 1994, Ling-yee 2006). Firms thereby take advantage of the temporary geographical proximity to make new acquaintances and maintain important relations (Maskell *et al.* 2006). Next, the networking activities occurring between cluster firms participating at ITFs and cluster firms not engaging at ITFs foster the geographical openness and the potential renewal of their firms through combined local and non-local networking c.f. Johannisson *et al.* (1994), DeMartino *et al.* (2006).[14] This ensures the

[13] In this study, institutions correspond to organizations that support local activities without making profits. Some examples are producer associations, unions, chambers of commerce, research centres, educational institutions, and government agencies. Institutions also include local organisations such as church groups, rotary clubs, and sports clubs.

[14] By relations are meant any linkage that is formed among individuals and firms due to social and business-related matters. The words *networking activities, relationships and relations* are used interchangeably in this paper.

potential creation of businesses as well as innovative products and processes.

To our mind it is difficult to provide a thorough understanding of the temporary geographical proximity of individual firms triggered at ITFs without considering the inter-connectivity of the overall local networking activities between firms in a cluster. This issue is important because clusters here are not only featured by horizontal relations (i.e. across industry linkages to competitors) and vertical relations (i.e. linkages to related industries). Clusters are also characterised by lateral relations between firms of non-related industries (Johannisson *et al.* 2002a). Lateral relations convey information and business exchange conducive to idea generation and rule reproducing behaviour across clusters (Johannisson 2000).[15] In addition, the overall networking activities of firms in clusters are also related to non-local actors. Some of the relations between local and non-local actors in clusters are established and maintained at ITFs. Subsequently, conceptualising proximity as a mainly geographically and (more or less) permanently anchored phenomenon has shown insufficient in clusters (Waxell and Malmberg 2007); the proximity between firms also has a temporary, geographical and/or relational character when coupled with ITFs. This situation triggers a need for a more elaborated conceptual framework of a geographical and relational proximity that helps understanding how clusters combine the local and non-local networking activities by means of ITFs. The aim of this paper is thus to make a further conceptual contribution and present empirical evidence of the role of ITFs for amplifying proximity in clusters. Accordingly, the following research questions are asked: *How do clusters amplify geographical and relational proximities by means of ITFs?* More precisely: *How is participation in ITFs disseminated in the cluster?*
The structure of the paper is as follows. Section 2 discusses the role of ITFs in stretching proximity and section 3 develops a conceptual framework. Section 4 reports on the research methodology, which describes how this framework is used. Section 5 discusses the findings. Section 6 provides the conclusions highlighting future research.

[15] Clusters are conceptualised as geographical concentrations of social and economic activities operating in the same, related and non-related industries. This conceptualisation differs and overlaps with other definitions adopted in the literature to inquire into similar socio-economic phenomena, such as industrial districts, industrial clusters, localised production systems, milieux, etc. (for other definitions see Marshall 1920, Becattini 1988, Camagni 1991, Humprey and Schmitz 1996, Porter 1998, Belussi and Pilotti 2002, Garofoli 2002, Scott 2002, Giuliani and Bell 2005). Clusters include horizontal and vertical networks of relations like the traditional definitions of clusters. According to Maskell (2001), the horizontal relations of a cluster include the interaction, co-operation and competition between firms producing similar goods. The vertical relations of a cluster correspond to the interactions, co-operation and competition between firms in networks of suppliers or customers. Clusters here also rely upon lateral networks of relations between and within members of non-related industries (Johannisson *et al.* 2002a).

2. The role of ITFs in creating proximity

Interest in ITFs has recently re-appeared in research as the literature in other disciplines has shown that public and private actors regularly use ITFs (e.g. Wilkinson and Brouthers 2000, Ramírez-Pasillas 2004, Maskell *et al.* 2006).[16] ITFs are not a new phenomenon; they appeared for the first time in 1851 in England and expanded during the 1980s (Rogers 2003).[17] Of the 2000 major events held worldwide in the 1990s, 60% took place in Europe, 20% in North America, 10% in Asia, and the remaining 10% in Latin America (Seringhaus and Rosson 1994). Certain ITFs have specialised as vertical events by gathering actors focused on a particular industry or line of business. Some examples of vertical events are: Frankfurt (Germany) for books, Los Angeles (US) for video games, and Cologne (Germany), Guadalajara (Mexico), High Point (US), Milan (Italy), Paris (France), and Rio Grande do Sul (Brazil) for furniture. In contrast, horizontal ITFs have a broad appeal with a wide range of products. An example is the Hanover fair (Germany). In 1992, the Hanover fair gathered 5,000 exhibitors and exceeded 400,000 visitors (Palumbo *et al.* 1998). The continuous growth and variety of ITFs makes it difficult to estimate the total number of events and participants around the world. Table 1 shows participation at ITFs in some European countries in 1993.

Table 1. ITFs in Europe during 1993

Country	Number of events	Number of visitors	Number of exhibitors	Visitors per event	Exhibitors per event
Germany	212	15,161,690	166,825	71,517	787
Italy	87	6,362,038	85,389	73,127	981
Spain	222	5,351,988	59,959	24,108	270
Sweden	64	1,327,732	24,918	20,746	389
United Kingdom	119	1,379,115	21,895	11,589	184

Adapted from: Munuera and Ruiz (1999:18)

[16] ITF is one of the different activities undertaken for specific reasons in the marketing-event industry of professional gatherings. Other activities not addressed in this paper include: scientific/technical conferences, congresses and conventions and overseas trade missions (Herbig *et al.* 1998, Palumbo *et al.* 1998, Wilkinson and Brouthers 2000).

[17] The direct antecedent of the modern ITFs is the sample fairs (i.e. also called 'Ausfuhrmesse', export fair, Allix 1922). These fairs were first introduced at the Crystal Palace in England in 1851 (Seringhaus and Rosson 1994) and then appeared in Leipzig in the 1890s (Allix 1922). The sample fairs were of an international character; they were organised periodically and were habitually held at the centre of a region of production. Buyers were offered samples of products, and orders were taken to be executed at contracted times. Products were dispatched from sellers to buyers without physically passing through the fair.

The role of ITFs in creating proximity is anchored in the organising context of clusters. The notion of the organising context was introduced by Johannisson (1988). Such a context is an enacted collaborative environment in which firms co-create their own development conditions (Johannisson 1994). This co-creation of development conditions means that firms enhance their social and business activities influencing one another in order to promote businesses or innovative products or processes. Thus, firms instigate and sustain their interactions, relations and collaborations in their organising context according to the issues being dealt with in their own firms and clusters (Johannisson 2000). This suggests that this context accentuates the role of clusters as a support for the firms' activities and is not necessarily restricted to clusters. The organising context can be defined territorially (e.g. limited to a cluster), functionally (e.g. global value chain), virtually (e.g. global networked structure) or be demarcated by a combination of them (Johannisson 2000, Johannisson *et al.* 2002a). The organising context, being socially, historically and culturally embedded, is manifested in networks (e.g. Johannisson *et al.* 2002a). Thus, when cluster firms participate at ITFs, they expand and maintain their networks, combining territorial, functional and virtual contexts. For firms engaged in international businesses, ITFs offer an opportunity for accessing information and people around the world at a low cost (Ponzurik 1996, Seringhaus and Rosson 1998, 2001) and for stretching their proximity. Firms exhibiting their products at ITFs obtain numerous advantages including having a qualified audience, a diminishing cost per new contact, developing relationships, building a reputation, evaluating buyers and competitors' new products (Rice 1992, Sharland and Balogh 1996, Blythe 1997). Firms visiting ITFs gather information on market access, new and alternative products and potential suppliers (Herbig *et al.* 1997, Munera and Ruiz 1999, Godar and O'Connor 2001).[18]

When addressing clusters as 'embedded' in organising contexts, firms interact and collaborate with local and non-local actors promoting entrepreneurial processes for the continuous renewal of businesses, products and/or processes. As certain non-local actors are often encountered at ITFs, it is possible to understand that what happens '*there*' at ITFs influences what happens next '*here*' in the networks, once the firms return home. By participating at ITFs firms gain better access to customers and information, consolidate and expand markets and improve their production (e.g. Florio 1994, Cuadrado-Roura and Ruvalcaba-Bermejo 1998). At clusters firms then enhance their social and business networking activities influencing one another in order to disseminate knowledge, generate new products or access new markets. The next sub-section (3.1) introduces the concept of proximity

[18] The concrete outcome of participation at ITFs for exhibitors and visitor varies depending on firm's strategy and is often materialised several months after the ITFs (Rice 1992, Hansen 2004).

in general, then discusses it in relation to ITFs in sub-section 3.2, after which sub-section 3.3 integrates them in a proximity conceptual framework.

2.1 Proximity in general

There is compelling research on proximity that considers the notions of closeness, relations and space in the literature of economics, geography and organisation (e.g. Audretsch and Feldman 1996, Almeida and Kogut 1999, Owen-Smith and Powell 2004, Boschma 2005, Capello and Faggian 2005). The literature agrees that 'proximity' is a crucial concept for studying the socio-economic activities of firms, clusters, networks and ITFs (e.g. Rallet and Torre 2000, Torre and Gilly 2000, Boschma 2005, Torre and Rallet 2005). In this paper proximity is inquired into considering a geographical and relational character within a time-frame (i.e. a permanent frame vs. a temporary frame).[19] Torre and Rallet (2005), in particular, recently proposed including the time frame in proximity. The time-frame of socio-economic phenomena has recently re-entered regional studies (e.g. Grabher 2002) but has long been elaborated upon in other disciplines (e.g. Wrigley 1919, Allix 1922).[20]

Geographical proximity refers to the co-presence of firms, institutions and people within a certain territorial reach. Geographical proximity is a relative phenomenon; it is weighted by transportation cost and time and is based on individuals' judgment of distance (Torre and Rallet 2005). It comprises the geographical distance to firms of the same and related industries (i.e. specialisation economies), to firms of different industries (i.e. diversification economies), and to associations, universities, research centres and public agencies (e.g. Capello and Faggian 2005). The time-frame, in particular, is central in geographical proximity. It introduces a dynamic character to the geographical proximity, frequently materialised by the travelling of individuals and the accessibility to transportation means (Amin and Cohendet 2004). Travelling brings people together because of the need for face-to-face contact for deal-making, relationship adjustment, evaluation and socialisation (Storper and Venables 2004). Thus, firms benefit from a permanent geographical proximity as long as they operate in a cluster. The permanent geographical proximity facilitates the local diffusion of technological capabilities and know-how (Saxenian 1994, Baptista 2000, Malmberg and Maskell 2002). In contrast, distant firms participating in joint projects share a

[19] Other authors have considered more complex definitions of proximity. Boschma (2005) considers cognitive, geographical, institutional, organisational and social proximities, Oerlemans and Meeus (2005) makes a distinction between spatial and organisational proximities, and Torre and Rallet (2005) differentiate between geographical and organised proximities.

[20] Allix (1922), in particular, addresses time in relation to the periodicity and itinerancy of fairs. The regular recurrence of fairs allows for the temporariness and itinerancy of encounters among traders, customers, debtors and creditors.

temporary geographical proximity for a short period of time when they travel to meet. Working by travelling has become more common between business people (Amin and Cohendet 2004). Thus, when co-presence between distant actors is needed, visits to offices or ITFs and intense meetings are agreed upon (Torre and Rallet 2005).

The sharing of a permanent or a temporary geographical proximity does not guarantee that firms interact and co-operate with each other, that is, sharing a relational proximity. Relational proximity refers to the existence of multi-stranded relations in which the same firms, institutions and individuals are 'embedded' in networks for different purposes (Wasserman and Faust 1994, Johannisson *et al.* 1994, Uzzi 1997, Hanneman and Riddle 2005). Multi-stranded relations foster closeness inasmuch as they permit distance between parties in networks. The networks include a mixture of market and embedded relations to secure a relational proximity but also a relational distance between firms. In other words, the 'multiplexity of a relation' denotes the multiple strands that a relationship between two actors can show (Wasserman and Faust 1994, Hanneman and Riddle 2005). It denotes that the ability of building relations among firms, institutions and people is recurrent, embracing different strands concurrently, but also changing over time (Larsson 1992, Ring and Van de Ven 1994).

Let us consider a relation between two individuals in two firms. This relation can have two strands, doing business and collaborating in a newly launched R&D project. The two individuals start socialising while working together in the R&D project building social bonds. Thus, they initiate a third strand in their relation, that is, they become friends. Once the specific project and commercial exchange are terminated, the firms distantiate themselves from one another. The firms' capacity to be associated in commercial activities and/or joint R&D projects becomes latent and is activated if needed (e.g. Grabher 2002, Grabher and Ibert 2006). If either of them needs to find a partner for a new R&D project, they phone their old colleague to get advice on suitable candidates. Alternatively, when they happen to meet at an ITF, they update themselves on each other's activities and can co-create new opportunities. This means personal networking that is activated spontaneously or when needed (Johannisson *et al.* 1994). Such personal relating indicates that business actors combine social and business concerns in individual relations, thereby producing legitimacy and resources for their firms (Johannisson 2000). In contrast, other research suggests that the different strands contained in a relation should be separated. Giuliani (2007) has proposed for instance the separation between the so- called business network of relations and the knowledge network of relations in a cluster. However, firms realise multiple strands simultaneously in a single relation (Johannisson *et al.* 2002b). Other literature has instead coincided in the conviction that the multiplexity of relations in networks is central for

entrepreneurship c.f. Johannisson et al. 1994 and innovation c.f. Powell *et al.* 1996. It is when those strands exist in a relation that the array of possibilities is created and they will hence be considered accordingly.

The multiplexity of relations stems from a logic of similarity and a sense of belonging between people. The 'logic of similarity' (Torre and Rallet 2005:50) indicates that relations between firms, institutions and/or people are characterised by the same system of representations or sets of beliefs (cf. mental space, Hernes 2003). Being similar facilitates collaborations, co-ordination and knowledge exchange among firms, institutions, and people (Capello and Faggian 2005). Firms, institutions, and people build a sense of belonging based on shared norms, routines or common interests. The logic of similarity and a sense of belonging enable the persons in firms and institutions to communicate and build multi-stranded relations (e.g. Johannisson *et al.* 1994). Relational proximity resembles the concepts of 'relational capital' (Capello and Faggian 2005:77) and 'organised proximity' (Torre and Rallet 2005:49). Relational capital refers to the rare capability of exchanging skills, interacting among different actors, trusting each other and cooperating even at a distance with other complementary institutions. Organised proximity refers to the ability of an organisation (i.e. firm, network, milieu) to make its members interact. We focus on relational proximity for one specific reason, and that is because it provides an opening for spontaneous and planned encounters between people, often leading to the establishment of a new relation or a new strand within the already existing relation (Wasserman and Faust 1994, Hanneman and Riddle 2005).

The time-frame is also central in relational proximity. Firms located in a cluster share a more or less permanent relational proximity through their networks. Firms invest in building trust and maintaining relationships to other firms (e.g. Saxenian 1994). Conversely, firms that engage in partnerships share a temporary relational proximity. When two firms launch a partnership, they establish a non-disclosure agreement for a specific period of time (Bathelt *et al.* 2004). When the specific partnership is terminated, social strands are built between actors in the firms. These strands can be reactivated to set up future partnerships or collaborations by email or video conference over long distances. In sum, relational proximity offers a powerful mechanism of both short and long distance co-ordination within a time-frame dimension that constitutes the foundation of increasing socio-economic interactions and collaborations around the world. Hence, it is important to consider geographical as well as relational proximity in order to understand how firms make use of ITFs when operating in a cluster.

2.2 Geographical and relational proximities facilitated at ITFs

ITFs bring firms together and create a temporary geographical proximity for an intense period of time (Maskell et al. 2006). Typically, the most important actors in an industry, line of business or product category convene at ITFs during several days (Seringhaus and Rosson 1994). These actors include buyers, suppliers, associations, universities, public agencies and visitors (i.e. journalists and the general public) (Godar and O'Connor 2001). ITFs provide a periodic and recurrent event for the interaction between individuals, novel products and new technologies (Breschi and Lissoni 2001). Such interaction is manifested through observation, monitoring, information exchange and trading occurring between firms at ITFs. In line with this, firms consciously choose what ITFs to join (Seringhaus and Rosson 2001). Exhibiting firms follow or avoid those events where industry leaders exhibit their products (Papadopoulos 1987). Light users of fairs locate close to the leaders and/or competitors in order to inform themselves about their latest innovations. Firms also aim at attracting visitors passing by the booths of industry leaders and/or competitors. Buyers and visitors make almost immediate comparisons. ITFs are thus the ideal occasions to observe what one's competitors are doing (Shust 1981, Hansen 1996). Firms gather information about industry trends, and other firms' strategies (Shust 1981). The collected information helps firms to make strategic decisions about policies and programmes in marketing, finance and production (Hansen 2004). In contrast, heavy users of fairs instead locate far away from their competitors to avoid imitative learning and the stealing of customers (Seringhaus and Rosson 2001).

During ITFs individuals and firms build permanent and temporary relational proximities in a variety of ways (e.g. Smith et al. 2003). At the organisational level such ways include maintaining and developing relations with customers to seek repeated sales (Carman 1968, Bonoma 1983, Kerin and Cron 1987, Seringhaus and Rosson 1994), establishing partnerships and relations with new customers (Rice 1992, Sashi and Perretty 1992, Hansen 2004) and meeting key decision-makers otherwise inaccessible (Shust 1981, Smith et al. 2003). However, there are two important considerations in relation to permanent or temporary relational proximities. First, these activities vary depending on whom firms plan to meet or happen to get in touch with. Second, building a relationship or a partnership is a process going beyond the limits of the ITFs. ITFs nevertheless provide opportunities to instigate relationships and partnerships that are otherwise too difficult or too costly (Florio 1994).

At ITFs firms meeting potential partners are induced to exchange ideas and get inspired through, e.g., socialisation (Rice 1990, Donckels and Lambrecht

1995, Hansen 2004). Many European booths have their own conference rooms and lounges where contacts are provided with snacks, drinks, presentations, and seminars, (e.g. Tesar 1988). Firms meet to discuss product designs, product functions, product improvements and quite often products failures as well (Bello 1992). Firms also attend the introduction of new or improved products (Carman 1968, Bonoma 1983) and participate in 'product' hands-on experience' (Kerin and Cron 1987, Seringhaus and Rosson 1994). Encounters between buyers, suppliers and even competitors commonly occur spontaneously at dinners, seminars and in corridors (Maskell *et al.* 2006). In such encounters firms stimulate a relational proximity to other firms. At meetings firms participate in an exciting setting for producing and circulating understanding and a way of expressing this understanding beyond its confines (e.g. Donckels and Lambrecht 1995). Firms thus co-create interpretative schemas and exchange knowledge. Returning to their home cluster, firms participating at ITFs acquire, assimilate, transform, translate and disseminate industry novelties within their networks. These firms rely on their networks because they need to continue producing new and improved products/processes. In the next section it is therefore addressed in one conceptual framework how firms combine their use of temporary proximity (ITFs participation) and permanent proximity (affiliation to cluster networks).

3. A conceptual framework of proximity

On the basis of the previous discussion a conceptual framework of proximity for studying the role of ITFs for amplifying local and non-local networking activities in clusters is proposed. In next page, table 2 summarises the conceptual framework. In this framework it is assumed that firms over time combine the geographical, relational, permanent and/or temporary proximities to their advantage. The framework consists of three 'orders' of interaction and collaborations in which proximity occurs manifested in networks. The capacity of co-operating among individuals and firms in particular will be considered here.

Table 2. A proximity framework interconecting clusters and ITFs

Proximity	First order Intra–cluster proximity	Second order ITF proximity	Third order Holistic proximity
Feature	Permanent geographical co-location among firms, which are sharing a relational proximity	Temporary geographical co-presence among firms engaging at ITFs, which are employing a permanent or temporary relational proximity at such events	Permanent geographical co-location among firms, which are sharing a relational proximity between firms participating at ITFs and firms that do not
Kinds	• *Local friendship relations* • *Local partnerships* • *Local personal networking*	• *Trans-national friendship relations* • *Trans-national market relations* • *Trans-national partnerships*	• *Multi-stranded relations between local firms participating at ITFs and local firms not engaging at ITFs*

The first order, intra-cluster proximity, is the co-existence of a permanent geographical proximity and a permanent relational proximity between individuals and firms.[21] The permanent geographical proximity induces the dissemination of collective learning processes and developing innovation (Visser and Boschma 2004). This may occur with or without a relational proximity. A permanent relational proximity in clusters highlights the existence of horizontal, vertical and lateral multi-stranded relations serving innovation purposes. Multi-stranded relations in clusters mirror the social embeddedness of economic activities (Granovetter 1973, 1985, Uzzi 1997). The social embeddedness facilitates the exchange of tacit knowledge in networks of relations, which is more difficult to trade in markets. In Table 2 three multi-stranded relations are considered: *'local friendship relations', 'local partnerships' and 'local personal networking'*.

The first local multi-stranded relation considered is '*friendship'*. Friendship means personal contacts frequently used as a source of information. These multi-stranded relations contain certain elements of friendship when a

[21] This statement does not mean that local relations last forever, but it does mean that once they are established, they tend to last long (e.g. Uzzi, 1997).

relationship is established. In the professional dimension individuals often enter into a personal relation for instrumental reasons varying from camaraderie and information access to status enhancement. Nevertheless, once individuals initiate a relation, they are likely to build trust, loyalty and commitment (Westphal *et al.* 2006). Friendship relations stimulate both planned and unplanned contacts between individuals. The second and third multi-stranded relations result from the literature reiterating how innovation should be considered a product of a network of relations (e.g. Håkansson 1987). The second multi-stranded relation, '*local partnership'*, indicates a situation where a firm establishes a *strategic alliance* with another firm in business and collaborations over innovation. Firms engage in local partnerships in cases where supplementary knowledge and skills are searched based on market conditions (and without social embeddedness). This approach is largely strategic (Gulati *et al.* 2000). Firms turn to partnerships to exchange knowledge, mobilise resources and relate to specialised actors. Partnerships are a means of obtaining resources and skills that firms cannot produce internally (i.e. Powell *et al.* 1996). The third and final local multi-stranded relation mentioned here is '*personal networking'* (Johannisson *et al.* 1994). Personal networking addresses multi-stranded-relations sharing business and innovation purposes where social embeddedness is the basis for a relational proximity. This relation takes a step ahead into the friendship relation; it acknowledges firms that are friends with each other but also realise business transactions and work together in order to innovate. Personal networking thus includes the human rationale, emotions and intuition fostering the continuous organising of people and resources (Johannisson 2000) and it encourages intended or unintended knowledge exchange and habitual local entrepreneurship by means of mutual commitment and spontaneity.

The second order, *ITF proximity*, refers to the trans-national relations instigated and sustained by means of regular participation at ITFs. Trans-national relations refer to non-local foreign linkages. In Table 2 three such relations are addressed: '*friendship relations'*, '*market relations'* and '*partnerships*'. '*Trans-national friendship relations'* are global personal knowledge networks (Johannisson 2000, Grabher and Ibert 2006). They are often built during temporary assignments and short encounters at increasingly transient organisational arrangements (Grabher 2002, Torre and Rallet 2005). Such *friendship relations* provide critical information like competitors' next move and recommendations for acquiring new customers. Firms commonly establish '*trans-national market relations'* with customers and suppliers at ITFs (Reid *et al.* 2005, DeMartino *et al.* 2006). Research indicates that exporting (and importing) firms benefit from commercial operations from non-local buyers and suppliers, who provide valuable information on product preferences, competing products, alternative technologies and the local context abroad (Salomon 2006). The literature on

clusters emphasises the benefits of formal partnerships in marketing, manufacture and R&D. '*Trans-national partnerships'* here correspond to proprietary pathways for directed transfers of information and resources that give significant advantages to associates. According to Bathelt et al. (2004), when firms find a potential trans-national partner, they decide how much information should be disclosed to the partner and to what extent the activities of the partner will be monitored. However, the more firms engage in distant partnerships, the more knowledge is incrementally spread to and from the firms and cluster (Owen-Smith and Powell 2004).

The third order, holistic proximity, is an activity linking the two previous orders of proximity; it includes local relations directly and indirectly connecting clusters and ITFs. Holistic proximity is realised in the networks by means of the 'bridge' relations between local firms attending ITFs and local firms not participating there. Firms engaging at ITFs enjoy the benefits of friendship relations, market relations and partnerships with trans-national actors. Because of their absorptive capacity (Cohen and Levintal 1990, Giuliani 2005), such firms can potentially acquire and assimilate external knowledge in the process of being transformed with reference to prior related knowledge.[22] Such knowledge is further translated and spread in the form of 'know-how' that can be used by their local partners in the home cluster to create opportunities (e.g. Pinch *et al.* 2003, Giuliani and Bell 2005). Holistic proximity is thus genuinely supplementary, as it pushes forward potential transformations in the products, services or processes of networks. Holistic proximity is also an activity that occurs deliberately and involuntarily, producing intended and unintended effects along the networks.

4. Research methodology

The overall research methodology is anchored in the study of how cluster firms engage at ITFs for establishing trans-national relations while sustaining local connections. This paper thus relies on a case study method (Yin 1984), according to which social network analysis provides a tool for mapping a proximity contributing to operationalisation as well as analytical generalisation. The case study was conducted in the Lammhult cluster where previous network studies have been carried out (Johannisson *et al.* 2002a, 2002b). Addressing firms' relations the primary unit of analysis is the cluster. This means that an 'embedded design' is adopted (Yin 1984) by aggregating firms' relations in a cluster network. The graph modelling and analysis is carried out with the help of a UCINET 6.51 (Borgatti *et al.* 2002) and an SPSS computer package. At the intra-cluster order the data collection and

[22] Cohen and Levinthal (1990) originally introduced the concept of absorptive capacity. Absorptive capacity refers to the ability of a firm to recognise extra-cluster knowledge, assimilate it, and share it with other firms (Giuliani and Bell 2005).

analysis thereby address multi-stranded relations occurring in a cluster network. At the ITF proximity order the data collection and analysis focus on the trans-national relations that firms initiate and maintain at such events. At the holistic proximity order the trans-national relations encountered at ITFs are linked to the clusters' multi-stranded relations in order to evaluate the importance of the inter-connectivity between ITFs and a cluster amplifying proximity.[23]

4.1 Introducing the Lammhult cluster

The Lammhult cluster is located in southern Sweden (see Figure 1). Lammhult is a small community with 2,000 inhabitants with a dominant furniture industry. This cluster was chosen for the study because it is known from earlier research that it is a cluster where the local and global contexts meet. The furniture industry emerged when sawmills were established in Lammhult around 1903–1905 and people began selling furniture to earn a basic living. In the last few decades, the furniture production has incorporated new production materials and information and communication technologies to interact with local and non-local partners. Manufacture planning systems combined with control numeric machines, groupware and computer-aided designs (CAD) have facilitated the creation of new markets, ergonometric styles and environmental-friendly designs. The codification of knowledge from engineering drawings to CAD files has prompted the formation of a local knowledge basis supplemented with non-local relations.

Figure 1. Locating Lammhult in Northern Europe

The data includes 31 firms located in Lammhult or its surroundings. The data collection was not based on a sample. In Lammhult there are about one hundred businesses whereof 37 are considered in this study. First, 31 firms were selected for this study because of our privileged access to the local trade association. Together these 31 firms employ about 600 people, and the two

[23] This implies that the analysis of the local and trans-national relations does not deal with the specific relevance of the relations for the firm.

largest ones (both in the furniture industry) have around one hundred employees each. These firms are externally owned and have regional managers on their boards. Of the 31 local firms 16 are in furniture and furniture-related industries, and some of them are nationally and trans-nationally renowned. As a group they lead private local employment and R&D investment. The remaining 15 local firms are quite heterogeneous members of non-related industries (i.e. financial services, window producer, fire equipment producer and security equipment trading).

4.2 Data collection and operationalisation of the proximity

Data was collected in a survey addressing the (owner) managers of the firms in 2005. Each manager was asked questions about their personal and firm networking activity with their local colleagues for the 2002-2004 period. The practical organising of the data collection meant that each business person got a complete list of the local firms and was asked to indicate the firm's interaction and collaboration with every other firm on nine different strands/kinds of relations (see Appendix 1 for details). The data on every strand is expressed in matrices. Each matrix is composed by 31 rows and 31 columns where 31 is the number of firms participating in the study. The cluster network uses four out of these nine strands (or four 31x31 matrices) to operationalise the proximity of the socio-economic activities in a cluster. This proximity is far beyond the mere aggregate of firms – e.g. a network of 31 firms includes 465 (31x(31-1)/2) potential mutual (reciprocated) local relations. In next page, table 3 shows the four strands included in this paper.

Table 3. Defining the proximity strands

Strands	Operationalisation
Social	
Acquaintance	The CEO or someone else in senior management and/or in the board of the firm is personally known.
Talk	A face-to-face or telephone meeting has been held with the senior management of the firm in the last 30 days. The conversation is to have lasted for at least five minutes and concerned things other than the weather.
Business	
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing and barter) with the firm in the past year.
Innovation	
Joint experimentation aiming at innovation	There has been collaboration involving the firm and aiming at innovation of for example: R&D and technology, new/improved products, new/improved processes, training and marketing/exporting in the past three years.

(Source: adapted from Johannisson *et al.* 2002a:229)

The social strands, acquaintance and talk, account for the social embeddedness in the cluster network. The idea here is that acquaintances and regular talks signify personal contacts that are activated when needed (Johannisson *et al.* 1994, Johannisson *et al.* 2002a). *The business strand* indicates the commercial transactions realised between firms to exchange standardised or specialised components and services (Johannisson *et al.* 1994, Johannisson *et al.* 2002b). *The innovation strand*, joint experimentation aiming at innovation, is a strand considered here, whose aim is to capture shared innovation activity in the cluster. Innovation means 'the search for, and the discovery, experimentation, development, and imitation, and adoption of new products, new processes, and new organisational set-ups' (Dosi 1988:222). Joint experimentation aiming at innovation addresses mutual innovation efforts shared by firms; they involve actions in generating the continuous renewal in the individual firm. This is intended to take one step beyond the simple exchange of information. This means focusing on the channels used to exchange knowledge, which provide occasions for engaging in spillovers, absorbing knowledge and, ultimately, enacting innovation. The operationalisation of the proximity strands is used as a basis to further operationalise the intra-cluster proximity, ITFs proximity and the holistic proximity as follows.

4.2.1 Operationalisation of the intra-cluster proximity

To operationalise the intra-cluster proximity order the four above-mentioned strands are combined in order to generate three distinctive multi-stranded relations comprising the actors that come together to socialise, develop, produce, and market various types of products (see Appendix 2 for calculations).[24] These multi-stranded relations, local friendships, local partnerships and local personal networking are summarised in Table 4. *Local friendship relations* are cases where firms are mutually connected by means of acquaintances and informal exchange of information (Johannisson *et al.* 1994, Johannisson *et al.* 2002b). *Local partnerships* combine commercial and joint experimentation aiming at innovation strands in one relation. *Local personal networking* indicates a personal relation that brings together friendship, commercial and innovation purposes. *Altogether*, these multi-

[24] These three multi-stranded relations do not represent all possible strands that could be accounted for in a cluster (for other types of strands and relations see e.g. Johannisson *et al.* 2002a, Giuliani and Bell 2005, Powell *et al.* 2005).

[25] Clusters are conceptualised as geographical concentrations of social and economic activities operating in the same, related and non–related industries. This statement means that clusters include horizontal and vertical networks of relations like the traditional definitions of clusters but also lateral relations. The horizontal relations of clusters include the interaction, collaboration and competition between firms producing similar goods. The vertical relations of cluster correspond to the interactions, collaboration and competition between firms in networks of suppliers or customers. Clusters here also rely upon lateral networks of relations between and within members of non-related industries (Johannisson *et al.* 2002).

stranded relations are linked in two cluster networks. In this paper two cluster networks are included with the purpose of having a point of reference between the definition adopted here and the traditional definition of clusters. The first cluster network operationalises the definition of clusters adopted here; it represents 'all of Lammhult' and includes horizontal, vertical and lateral relations (see also Johannisson *et al.* 2002a). The second network accounts for the traditional definition of cluster; it is the 'furniture subcluster' which only comprises horizontal and vertical relations. The affiliation to these networks is estimated by means of its density. Network density means the proportion of the relations that are realised with respect to the total possible number, ND = n(n-1)/2, n being the number of nodes in the network (Wasserman and Faust, 1994).

Table 4. Defining the intra-cluster proximity

Multi-stranded relation	Operationalisation
Local friendship	Combined 'acquaintance', and 'talk' strands.
Local partnership	Coinciding 'commercial' and 'joint experimentation aiming at innovation' strands (but not 'friendship relations').
Local personal networking	'Commercial' and 'joint experimentation aiming at innovation' strands coinciding with 'friendship relations'.

4.2.2 Operationalisation of ITF proximity

The business persons were given a set of questions regarding their use of proximity at vertical ITFs. They were asked about the trans-national relationships created and maintained at ITFs in the previous three years (see Appendix 3 for a detailed description). These questions aim at identifying the relations initiated and sustained as a result of participation pre and post ITFs. They are summarised in Table 5.

Table 5. Proximity activities resulting from participation at ITFs

During–ITFs	Post–ITFs
-The firm obtains new trans-national friends, customers, and suppliers at ITFs.	- The firm receives an order from trans-national customer met at ITFs.
-The firm maintains existing trans-national friends, customers, and suppliers at ITFs.	- The firm submits an order to a trans-national supplier met at ITFs.
-The firm finds suitable trans-national partners at ITFs.	- The firm establishes a partnership with a trans-national actor met at ITFs.

4.2.3 Operationalisation of holistic proximity

Here we associate holistic proximity with the local networking of firms participating at ITFs. Holistic proximity includes situations where '*firms that actively use their proximity* at ITFs' are linked with other local firms which are not engaged in such events. We define 'the firms that actively use their ITFs proximity' as the firms that (1) participate at ITFs, (2) meet with existing trans-national customers and suppliers, and (3) find trans-national partners. With this data we create a two-mode matrix. This matrix has 31 rows and three columns; 31 representing the number of firms and three accounting for variables making a firm an active user of ITFs. This calculation identifies the three multi-stranded local relations that help promoting a geographical openness directly and indirectly. The analysis identifies three different situations:

1) Firms which *actively use their* ITF *proximity* and have a friendship relation – *but no other type of multi-stranded relation* – with other local firms that do not participate at ITFs.

2) Firms which *actively use their* ITF *proximity* and have a local partnership – *but no other type of multi-stranded relation* – with other local firms that do not participate at ITFs.

3) Firms which *actively use their* ITF *proximity* and have carried out personal networking – *but no other type of multi-stranded relation* – with other local firms that do not participate at ITFs.

All these multi-stranded relations are then connected in the overall Lammhult network. In the network the firms that work internationally are linked to the firms operating locally (and often working on a national scale).

5. Findings

5.1 Lammhult cluster background data

Table 6 introduces background data on the Lammhult cluster. The Lammhult cluster is part of a wider regional setting dominated by small (family) businesses. In the cluster firms have an average size of 18 employees, 10 of them being managed by founders and 19 run by owner managers. In the case of 13 firms they have their most important business talking partner in the cluster. Six of them have their most important supplier locally, four of them abroad, and 20 firms have it in the rest of Sweden.

Table 6. The Lammhult cluster - background data

Characteristic	Lammhult cluster (31 firms)
Data collection year(s)	2005
Firm structure	
Number of firms	37
(Respondents generally)	31
(Respondents network data)	31
Firm size (employees) (1)	10 (18.0)
Firm management	
Number of founder managers	10
Number of owner managers	19
General firm network	
Number of firms' primary business relations situated in the cluster (2)	13
Number of firms' most important supplier situated in the cluster (3)	6
Number of firms' most important supplier situated in the rest of Sweden (3)	20
Number of firms' most important supplier situated abroad (3)	4
Market location (%)(1)	
Selling:	
In the cluster	10 (28.4)
Abroad	5 (11.2)
Purchasing:	
In the cluster	7.5 (20.5)
Abroad	0 (12.5)
R&D	
Number of firms investing in R&D in the past two years	13

Notes:
(1) Medians with the means within parenthesis.
(2) The respondents were asked to identify the location of the five most important persons that they favoured when discussing their business in general.
(3) Importance was defined with respect to how long it will take to replace the supplier in months.

In Table 7 data on the proximity strands is presented for the overall Lammhult cluster and the furniture subcluster. The networks in the furniture subcluster are denser than in the overall Lammhult cluster. In the overall cluster 61.5 % of the possible 'acquaintances' (i.e. 286 relations out of 465 possible) are realised. In contrast, 73.3 % of the possible acquaintances (i.e. 88 relations out of 120 possible) are carried out. One explanation is the

spontaneous networking occurring locally as a result of the intense activities organised by the trade association and other firms in order to brand Lammhult as the Kingdom of Furniture. This implies that the firms in the overall cluster interested in the promotion of Lammhult's industrial and tourism activities have greater possibilities for meeting other concerned firms. The commercial operations and joint experimentation over innovation are more intense in the Lammhult furniture subcluster than in the overall cluster. The overall cluster realises 16.3 % joint experimentation over innovation (i.e. 76 out of 465) while the furniture subcluster reports 16.3% relations (i.e. 44 out of 120). In the furniture subcluster these numbers reflect advanced specialisation and collaboration. Yet, the existence of relations between and within the overall cluster signals the existence of firms involved in shared innovation activities.

Table 7. Network density in Lammhult (%) (1)

Relationship characteristic	Overall cluster (31 firms)	Furniture subcluster (16 firms)
Acquaintance	61.5	73.3
Talk	26.7	40.0
Commercial (2)	33.8	41.7
Joint experimentation aiming at innovation	16.3	36.7

Notes:

(1) Network density corresponds to the percentage of relations realised out of 465 (i.e. 31x (31-1)/2) in the 2005 survey. In the Lammhult subcluster, the numbers correspond to the total possible relations for each strand, which is 120 (i.e. 16x (16-1)/2) in the 2005 survey.

(2) A commercial relationship was defined with respect to the business exchanges in the previous year.

5.2 Intra-cluster proximity

Intra-cluster proximity indicates the existence of a network between firms and business persons in the Lammhult cluster. In Table 8 the intra-cluster proximity combines the multi-stranded relations for social, business and innovation purposes in the overall Lammhult cluster and its furniture subcluster. Local friendship relationships characterise the overall Lammhult cluster, but they are more intensified in the subcluster. The overall Lammhult cluster shows 24.1% of the friendship relations (i.e. 113 out of 465). The furniture subcluster realises 35.8% of the potential friendship relations (i.e. 43 relations out of 120 possible). This suggests the existence of an open circulation of informal information in the cluster, characterised by the social embeddedness. The overall Lammhult cluster reports 2% local partnerships (i.e. nine relationships out of 465 possible), while the furniture subcluster

reports 5.8% partnerships (i.e. seven relationships out of 120 possible). These low numbers suggest that the cluster operates in a collaborative environment that allows firms to interact with each other constantly without a need for formalisation. The local personal networking activities between local firms in the furniture subcluster are denser than in the overall cluster at large, 11.4 % local personal networking activities being realised in the overall cluster (i.e. 53 relations out of 465) and 24.2 % local personal networking between firms being present (i.e. 29 relations out of 120 possible). These numbers correspond to the specialised activities performed by firms in order to innovate.

Table 8. The relational proximity in the Lammhult cluster

Multi-stranded relation characteristic	**Overall cluster** (1)	**Furniture subcluster** (2)
Local friendship	24.1	35.8
Local partnership	2.0	5.8
Local personal networking	11.4	24.2

Notes:

(1) The numbers correspond to the network density i.e. the percentage of relations realised out of a total of 465 possible (i.e. 31x(31-1)/2) in the entire cluster in the 2005 survey.

(2) The numbers correspond to the network density i.e. the percentage of relations realised out of a total of 120 possible (i.e. 16x (16-1)/2) in the 2005 survey.

The visualisation of the network and every multi-stranded relation in Figure 2 illustrates the intra-cluster proximity in Lammhult (see next page). When examining individually every multi-stranded relation ‘network’ embedded in the cluster network, there are several important issues to discuss. The resulting figures show that friendship relations are important for connecting the overall firms in Lammhult. The social embeddedness provides a basis for firms in choosing collaborating partners while keeping doors open if needs/problems should appear. Personal networking relies on some of those friendship relations for business and innovation activities and is carried out in the overall network. While the resulting local partnerships are low in number, they link firms whose most important supplier is located either in Lammhult, in the rest of Sweden or abroad. This is important for bringing in external knowledge and generating renewal in firms and cluster. This also suggests that firms make a conscious selection of the products (i.e. components) that they want to continue producing at close quarters. This is probably because of the degree of tacitness and advanced specialisation required to generate such products.

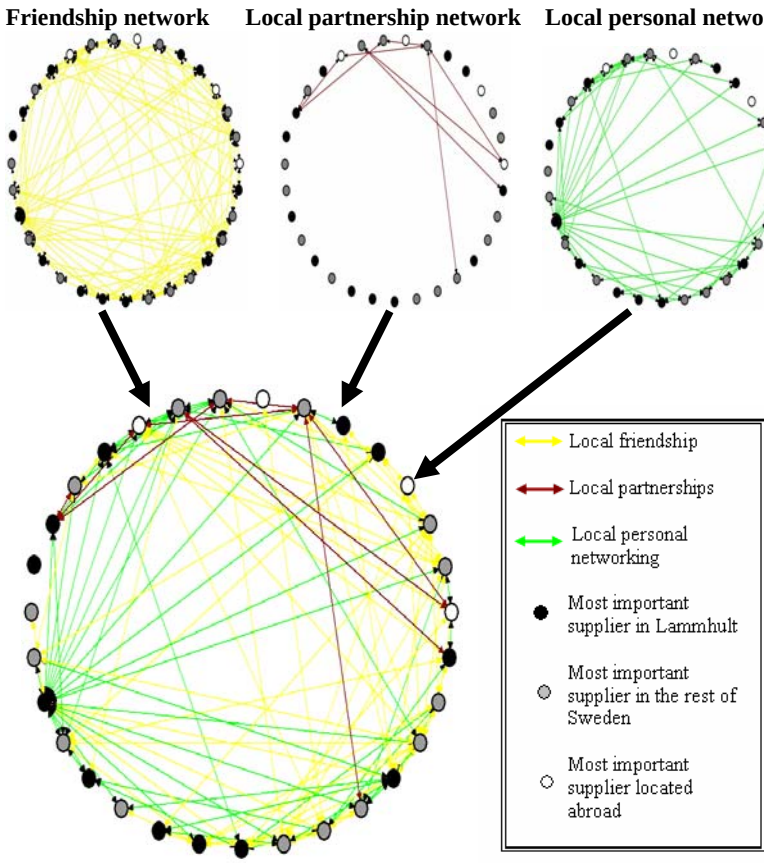

Figure 2. The intra-cluster proximity of Lammhult

Note: Firms were asked to indicate the location of their most important supplier (i.e. Lammhult, the rest of Sweden, abroad). Importance was defined with respect to how many months it will take to replace the supplier.

5.3 ITF proximity

In Table 9 the ITF proximity of the Lammhult cluster is reported (see next page). The overall Lammhult cluster includes 13 firms that participate at ITFs, 10 of them belonging to the furniture sub-cluster. Firms attend as visitors to two ITFs annually on average and exhibit on average at three ITFs. In this case there were only 10 firms exhibiting their products at ITFs. Moreover, two firms reported having obtained their most important trans-national friendship relation at ITFs. Furthermore, seven firms stated having found their most important trans-national market relations (i.e. one customer and one supplier) and nine firms reported having obtained trans-national partnerships there. The overall meaning of these numbers is that firms benefit from exhibiting products and visiting ITFs because they have people visiting

and trading at their booths. Such numbers indicate that these firms use ITFs as a platform for connecting to non-local networks. They probably use ITFs to search, find and adjust relationships. Above all, at ITFs firms have time for reflection on their own business development and strategy associated to their local and global connections, as these are not involved in their everyday activities.

Table 9. ITF proximity, 2005 sample

Characteristic	Lammhult firms attending ITFs (13 firms)
Temporary geographical proximity	
Proportion of Lammhult firm sample that participates at ITFs (%)	41.9
Average attendance at ITFs as visitors per year (1)	2 (1)
Attendance at ITFs as exhibitors per year (2)	3 (4)
Permanent relational proximity with temporary geographical proximity	
Number of firms that first met their most important trans-national friendship relation at ITFs	2
Number of firms that first met their most important trans-national customer at ITFs	7
Number of firms that first met their most important trans-national supplier at ITFs	7
Number of firms that had meetings with existing trans-national customers at ITFs	9
Number of firms that had meetings with existing trans-national suppliers at ITFs	11
Percentage of trans-national customers found at ITFs (3)	5 (16.3)
Percentage of trans-national suppliers found at ITFs (3)	0 (4.5)
Temporary relational proximity with temporary geographical proximity	
Number of firms who found trans-national partnerships at ITFs	9

Notes:

(1) Average attendance as visitors with the number of firms visiting ITFs in parenthesis.

(2) Average attendance as exhibitors with the number of firms joining ITFs in parenthesis.

(3) The medians with the means in parenthesis.

5.4 Holistic proximity

Holistic proximity exists when firms producing and activating their proximity at ITFs interact and collaborate with other firms in the cluster network. Of the local friendship relations 20.5 % are shared between firms that participate at ITFs and the firms that do not (i.e. 23 out of 112 possibilities). This is important because friends are good sources for narrating the novelties and trends met at ITFs. Figure 3 shows that the 'bridge' relations link the overall Lammhult cluster.

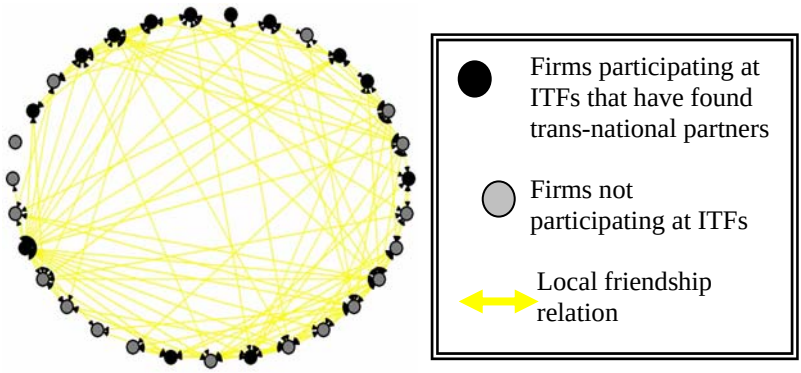

Figure 3. The holistic proximity in the friendship relations of the overall Lammhult cluster network

In addition, 33.3 % of the local partnerships (i.e. 3 out of 9 relations) are shared between the firms that participate at ITFs and those that do not participate. Such alliances fuse the interactions of firms that have similar and/or complementarily knowledge and skills. Figure 4 illustrates graphically the local partnership realised in the Lammhult cluster.

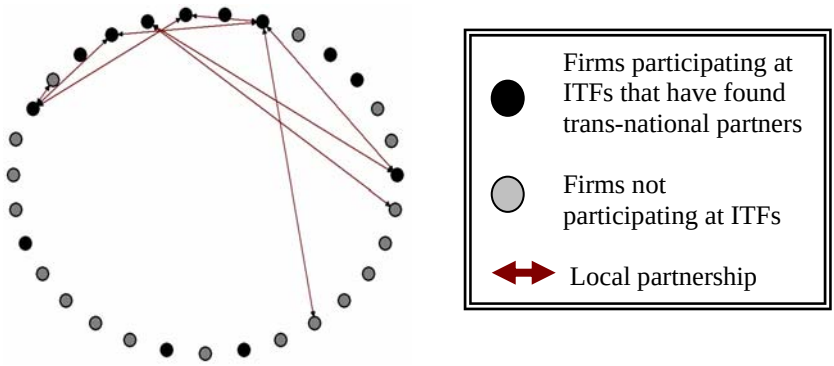

Figure 4. The local partnership of the overall Lammhult cluster network

Of the existing personal networking 33.96 % is realised between the firms that participate and those that do not participate at ITFs (i.e. 18 out of 53 relations). These 'bridge' relationships indicate the potential conduits for the continuous renewal of the networking activities. Figure 5 shows this graphically. It is important to note here that there is one firm participating at ITFs that is not engaged in personal networking. This signalises that such a firm uses ITFs as a potential compensating mechanism to produce and trade its products.

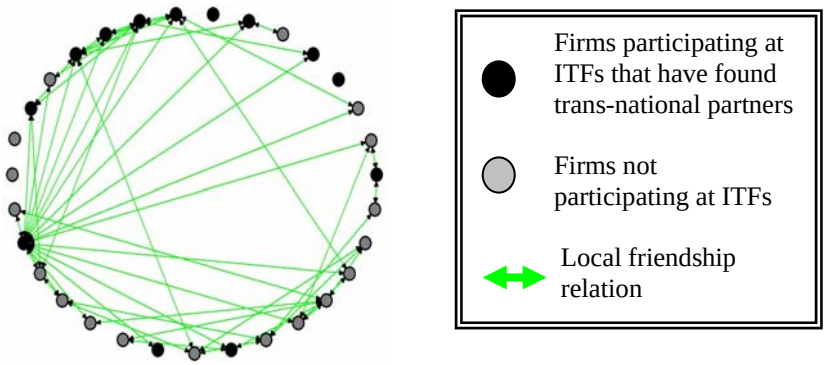

Figure 5. The personal networking of the overall Lammhult cluster

Above all, when examining the overall cluster network in Figure 6, the 'bridge' relationships provide firms with communication channels to talk about novelties and upcoming fashion trends in their industries. Such channels are also carriers of inspiration and idea generation to renew their collaboration projects. They can also potentially push a geographical openness that is needed for sustaining innovation in the cluster.

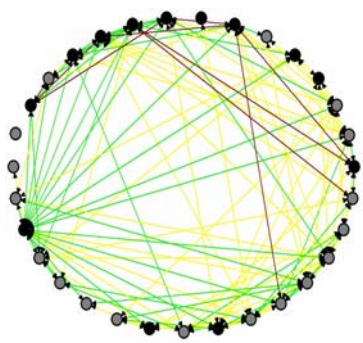

Figure 6. Holistic proximity in the overall Lammhult cluster network

6. Conclusions

This paper developed a proximity framework to understand how clusters balance local and non-local foreign relations when firms operate at ITFs. Research has been carried out in the Lammhult cluster in Sweden in order to identify how the relations encountered at ITFs are indirectly and directly connected in the cluster network. Our findings suggest that the Lammhult case supports the applicability of the conceptual framework and demonstrates the inter-connectivity between ITFs and a cluster for amplifying proximity. This paper shows that, by combining different orders of proximity, the Lammhult cluster conducts local networking activities by hand to non-local relations initiated at ITFs. This of course offers little support for the idea that the inter-connectivity between the local and non-local activities has fostered geographical openness and materialised in businesses, new products or processes. However, as we have seen in the Lammhult cluster, firms were directly or indirectly interconnected with other firms participating at ITFs by means of their networks. Thereby, there were multiple possibilities for participating in the channels carrying the novelties and fashion trends in their industries. These possibilities are not related specifically to certain members in the Lammhult cluster; however, they comprise at least a direct link from the firms participating at ITFs to every firm in the overall network. This link corresponds to the holistic proximity triggered by the inter-mingled local and non-local interactions and collaborations between firms participating at ITFs and firms that do not participate.

Still, additional research is clearly required to test the conceptual framework and the methodology utilised to operationalise it across a range of clusters. In this paper the Lammhult cluster showed that firms which employed their intra-cluster proximity instigated and sustained non-local relationships at ITFs. By means of multi-stranded relations firms participating at ITFs were inter-connected with other firms that did not. These multi-stranded relations ensued the continuous renewal of firms by fostering entrepreneurial processes in the cluster network. In addition, one firm participating at ITFs was not engaged in joint innovation activities in Lammhult. This indicates that the firm uses ITFs to create functional and/or virtual organising contexts.

Firms participating at ITFs have probably had a major influence in the continuous renewal of the cluster network for two reasons. First, such firms have had access to the latest fashion trends and novel technologies at ITFs. At such events firms gather actors specialised in their line of business or industry. Second, firms representing the Lammhult business community are also engaged in the collective promotion of their industrial activities at international furniture trade fairs. This fosters a collective preparation between firms for participating at ITFs and guarantees the spreading of novelties after ITFs across Lammhult. After ITFs, they can meet there to

create new joint opportunities for accessing markets, monitor each other, support newcomers and adjust relationships. To understand this line of argument, it becomes clear that future research should consider how, by means of regular participating at ITFs, these firms observe and talk about the latest innovations and become aware of their position in their global industry influencing their cluster network. Furthermore, this involves individual and collective learning processes (Maskell and Malmberg 1999). Such firms initiate their own learning processes, as they mirror their strategy and business development with those of many others engaged at ITFs (Hansen 2004, Maskell et al. 2006). These individual learning processes in a firm can be gradually routed on to local partners at the cluster (Owen-Smith and Powell 2004, Powell *et al.* 2005). That is, the holistic proximity can potentially help cluster firms to overcome the limitations of a permanent geographical proximity by fostering collective learning processes. Future research should thus also examine the centrality of these firms to indicate the impact of their networking in the clusters for coordinating resources, actors and activities in such learning processes.

The findings suggest that all firms do not have to engage at ITFs. Yet, all firms should reflect and discuss with their network partners the information and ideas generated at ITFs. This is a central activity for the cross-fertilisation of knowledge in their firms and also collectively in their cluster. ITFs are expensive events that require sales preparation, new products, booth design and evaluation (Hansen 2004). Firms and individuals should be more aware that such events allow them to make new contacts and keep old acquaintances (Smith *et al.* 2003). At ITFs they can get key information, select more qualified partners, and learn about new markets. Newcomers in clusters can access ITFs through their partners, thus avoiding the risk and the costs involved when participating for the first time in such a venue. For newcomers this is an important opportunity to build a reputation, instigate relationships and learn about both their global industry and the firms in their own home cluster.

The findings here indicate that understanding the potential influence of ITFs on the Lammhult cluster network is important to business owners, business managers, public policy-makers and scholars. Policy-makers should find ways of fusing the support to firms embedded in clusters with the specific encouragement of participation at ITFs. This support should differentiate between types of ITFs (i.e. vertical or horizontal), size of firms, firms' needs and the relevance of ITFs to the firms' and clusters' specialisation.

Participation at ITFs is, furthermore, one of the activities contributing to reaching a local and global balance. This is important to consider because there are other activities and factors influencing the globalisation process. Future research should compare the importance of ITFs with the influence of

global buyers, ICT and relocalisation strategies. Yet, the framework developed and the empirical evidence provided here represent a step further in the ongoing process for understanding how globalisation is influencing networks in clusters.

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Appendix 1.

Operational definitions of strands

The following appendix includes the adopted operational definitions of the strands considered for studying multi-stranded relations.

Strands	Operationalisation
Social strands	
Awareness	The firm and its operations are known
Acquaintance	The CEO or someone else in senior management and/or in the board of the firm is personally known.
Talk	A face-to-face or telephone meeting was held with the senior management of the firm over the last 30 days. The conversation should have lasted for at least five minutes and concerned things other than the weather.
Business strands	
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing, and barter) with the firm in the past year.
Joint collaboration over marketing	In the past three years the CEO or someone else in senior management and/or on the board has been participating in local branding projects such as: organisation of workshops, conferences and fairs, renovation of restaurants, cafés and hostels, commercial missions and joint advertisement.
Innovation and knowledge strands	
Joint experimentation aiming at innovation	In the past three years, there has been co-operation involving the firm and aiming at innovation of for example: R & D and technology, new/improved products, new/improved processes, training and marketing/exporting.
Meeting at ITFs aiming at innovation	A face-to-face meeting was held with the senior management of a firm at ITFs in the past three years. The meeting is to have addressed R&D and technology or new/improved products, new/improved processes or training and/or marketing/exporting.

Technical knowledge (asymmetrical)	The staff of the firm has contacted the firm when an ingenious or critical technical problem has turned up in the past three years.
Competitors' intelligence at ITFs (asymmetrical)	In the past three years the CEO or someone else in senior management has met the firm during an ITF and by this means informed him- or herself about the company activities/products/plans in the past three years.

Appendix 2.

Proximity

Intra–cluster proximity

We are dealing with four basic kinds of relations strands between firms: acquaintance, talk, commercial and joint experimentation over innovation. These relations are described by the following adjacency matrices:

1) *acquaintance (i,j)*
2) *talk (i,j)*
3) *commercial (i,j)*
4) *joint experimentation aiming at innovation (i,j)*

Each one of the adjacency matrices has the elements:

$$a(i,j)=\begin{cases}1 \text{ if firm i has a relation with firm j}\\ 0 \text{ otherwise}\end{cases}$$

The figures in Table 7 are based on mutual (reciprocated) relations. The maximum number of mutual relations is: $\binom{n}{2} = n*(n-1)/2$ where *n* is the number of firms.

Example: We have 286 out of 465 possible mutual relations among the 31 firms in Lammhult, which are realised by acquaintance relations (but also for talk, commercial, and/or joint experimentation aiming at innovation). This gives us the percentage 286/465=61.5%

These results provide the basic data for estimating the relational proximity in Lammhult when combining different strands of relations into three multi-stranded relations: local friendship, local partnership and local personal networking. The number of realised multi-stranded relations forms the basis of the figures in Table 8. Each multi-stranded relation indexes the aggregated relations among the set of actors in a single multiple one according to the following specifications.

Local friendship is defined as a symmetrical relation based on acquaintance and talk with the adjacency matrix.

$$\text{Local friendship} = \begin{cases}1 \text{ if acquaintance and talk}\\ 0 \text{ otherwise}\end{cases}$$

Example: We have 112 mutual relations among the 31 firms in Lammhult, which according to our definition can be described as friendship relationships. This gives the percentages 112/465 = 24.1 %.

In order to estimate local partnership and local personal networking, we need to consider the further specifications:

Commercial is defined as an asymmetrical relation to include vertical, horizontal and lateral interaction in the cluster, i.e. Commercial (i,j)=1 does not necessarily indicate that commercial =1. In order to simplify our calculations we have asymmetrised this relation as follows:

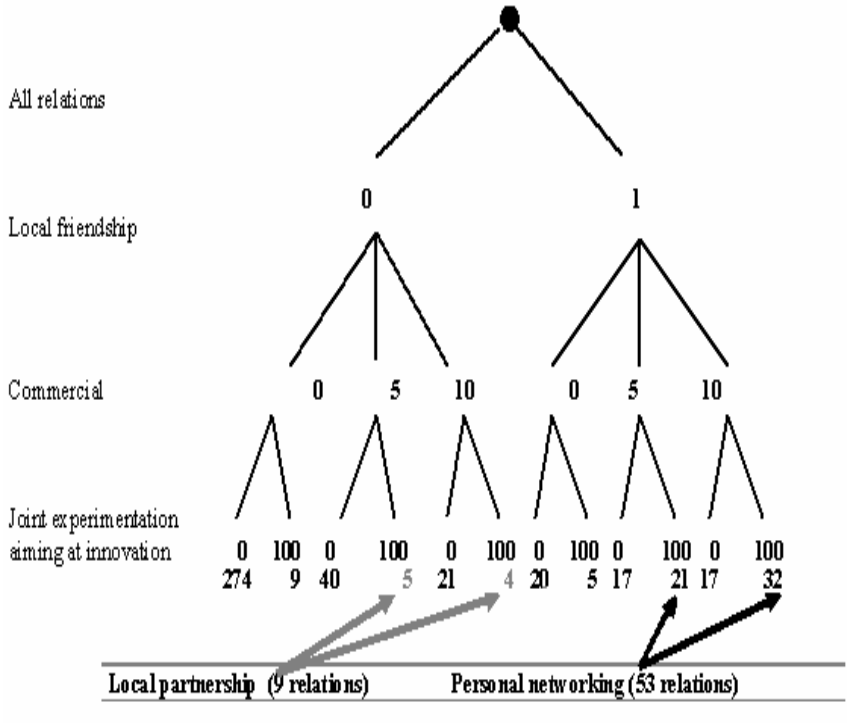
$$\text{Commercial} = \begin{cases} 1 \text{ if there is a mutual relation} \\ 0.5 \text{ if there is a one-way relation} \\ 0 \text{ otherwise} \end{cases}$$

Joint experimentation aiming at innovation is by definition symmetrical. Local friendship, commercial and joint experimentation aiming at innovation can now be combined in 2*3*2 different ways, which will be the basis for our calculation of local partnership and local personal networking. In order to describe the concepts simpler, we multiply the elements in the adjacency matrix 'Commercial' by 10 and the elements in the adjacency matrix 'joint experimentation over innovation' by 100.

Case	Code	Strands of relation between firms i and j
1:	000	No relation
2:	100	Only joint experimentation aiming at innovation
3:	005	Only a one-way commercial relation
4:	105	Joint experimentation aiming at innovation and one-way commercial relation but no friends
5:	010	Only mutual commercial relation
6:	110	Joint experimentation aiming at innovation and mutual commercial relation but not friends
7:	001	Only friends
8:	101	Joint experimentation aiming at innovation and friends but no commercial relation
9:	006	One-way commercial relation and friends but no joint experimentation aiming at innovation
10:	106	Joint experimentation aiming at innovation, one-way commercial relation and friends
11:	011	Mutual commercial relation and friends but no joint experimentation aiming at innovation
12:	111	Joint experimentation aiming at innovation, mutual commercial relation and friends

These cases can now be combined into:
Local partnerships (code 105 and 110), local personal networking (code 106 and 111).

The following dendrogram shows the 12 possibilities with the corresponding number of relations.



Note: The total number of mutual relations is: $\binom{31}{2} = 465$.

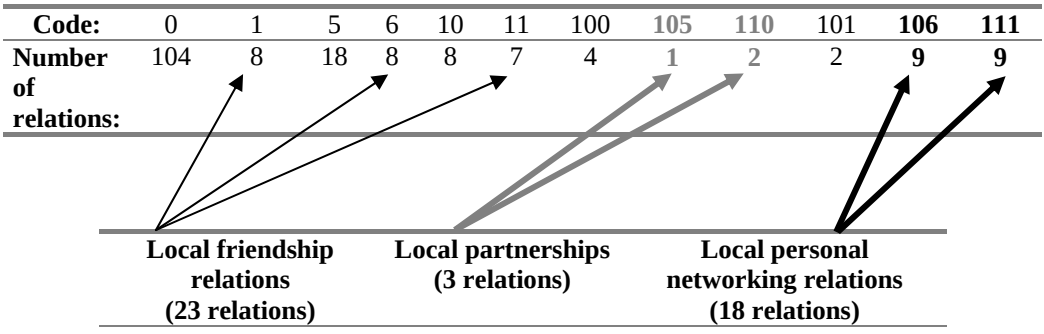
ITFs proximity

The figures in Table 9 describe the relations that local firms carry out with non-local firms at ITFs. This analysis is estimated with survey data and descriptive statistics.

Holistic proximity

Data on ITFs proximity in Table 9 is prepared for estimating holistic proximity. Within the data on attending ITFs, meeting trans-national customers and suppliers at ITFs, and finding trans-national partners there, a

two-mode matrix is created in order to describe the 'bridging' multi-stranded relations. Firms attending fairs but without meeting trans-national customers and suppliers and finding any trans-national partners are excluded. We now study the multi-stranded relations participating and non-participating firms following the previously described method and obtaining the next result:



Note: The total number of possible relations is: 10(31-10-3)=180. The total number of multi-stranded relations within holistic proximity is: 44.

Appendix 3.

Extra-cluster proximity through ITFs

Variable type/name	Definition of variables
Temporary geographical proximity	
Visitor Abroad	Number of ITFs attended abroad as visitor in the past three years
Exhibitor Abroad	Number of ITFs attended abroad as exhibitor in the past three years
Visitor Sweden	Number of ITFs attended as visitor in Sweden in the past three years
Exhibitor Sweden	Number of ITFs attended as exhibitor in Sweden in the past three years
Permanent relational proximity with permanent geographical proximity	
Monitor local firms	Number of local firms' stands visited during an ITF and by this means informing him- (her)self about the company activities and products in ITFs in the past three years
Planned or unplanned meetings celebrated with other local firms	Number of planned or unplanned meetings celebrated with other local firms in order to discuss R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs in the past three years
Permanent relational proximity with temporary geographical proximity	
Friendship relation arena	Made first contact with the two most important personal contacts at ITFs in the past three years
Most important trans-national customer arena	Made first contact with the most important trans-national customer at ITFs in the past three years
Most important trans-national supplier arena	Made first contact with the most important trans-national supplier at ITFs in the past three years

Maintain relationships with existing trans-national customer	Arranged a meeting with an existing trans-national customer at ITFs in the past three years
Maintain relationships with existing trans-national suppliers	Arranged a meeting with an existing trans-national supplier at ITFs in the past three years
Trans-national customers	Percentage of trans-national customers that were first contacted at ITFs in the past three years
Trans-national suppliers	Percentage of trans-national suppliers that were first contacted at ITFs in the past three years
Have celebrated a meeting with a trans-national partnership and a local firm	Have met with an important trans-national partner and a local firm to discuss R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs in the past three years
Temporary relational proximity with temporary geographical proximity	
Have initiated new trans-national partnerships	Have found a new trans-national partner in research, production and/or marketing in ITFs in the past three years
Have met existing trans-national partnerships	Have met with an important trans-national partner to discuss R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs in the past three years

Paper IV

Resituating proximity and knowledge cross-fertilisation in clusters by means of international trade fairs

by

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0. Abstract

This paper elaborates a proximity framework and provides empirical evidence of how knowledge cross-fertilisation is instigated at international trade fairs (ITFs) and continued in a cluster network. The cluster network depicts the multi-stranded relations in which the same firms are 'embedded' for business and innovation purposes at three proximity orders. The first order, the intra-cluster proximity, concerns the local networking. The second order, the ITF proximity, comprises local and trans-national relations stimulated at the events for generating knowledge. The third order, the holistic proximity, resituates the relations and partnerships in which at least one firm produces new or improved products or processes after the ITFs. This paper applies a case study method relying on social network analysis to explore the knowledge cross-fertilisation initiated at ITFs and furthered at a Swedish cluster in Lammhult. The findings suggest that in the cluster network the local partnerships and local personal networking activities between firms participating at ITFs and between firms participating at ITFs and firms that do not translate and rearticulate the acquired external knowledge through their interactions. This results in multiple forms of recombination of knowledge potentially beneficial for creating new businesses, new products and new processes. Creating awareness of the ITFs' influence on the innovation activities of the Lammhult cluster is significant for business persons, public policy-makers and scholars.

Key words: international trade fairs, clusters, proximity, knowledge cross-fertilisation, social network analysis.

1. Introduction

International trade fairs (ITFs) are those events in which firms in the same industry, product line or product category convene in order to trade and search for new or improved products and processes in foreign and national markets (Palumbo *et al.* 1998). In clusters firms engage at ITFs in order to break the cognitive lock-in, improve their production and build their networks (Reid *et al.* 2005, De Martino *et al.* 2006). At ITFs firms meet with their customers, suppliers and colleagues to discuss their products, adjust relationships, evaluate buyers and suppliers, and exchange information on market trends and the technological advancement of their industries (Hansen 2004). Firms thereby take advantage of the temporary geographical proximity to non-local sources and instigate a relational proximity to contacts relevant to sales and innovation.

ITFs have been associated with clusters as part of the different activities prompting a local and global balance in clusters (e.g. Maskell *et al.* 2006). The relevance of ITFs for knowledge cross-fertilisation has been highlighted by the literature on entrepreneurship, geography, international business, marketing and regional studies (e.g. Allix 1922, Donckels and Lambrecht 1995, Munuera and Ruiz 1999, Smith *et al.* 2003). Knowledge cross-fertilisation is conceptualised here as the unintended and intended consequence of dialogue, reflection and observation of others when there is a commitment of firms in clusters to ITFs. Such cross-fertilisation often emerges as an exchange of knowledge and is followed by making sense of such knowledge. This results in multiple forms of interpretation, rearticulation and recombination of knowledge beneficial for creating new businesses, new products and new processes in clusters. Knowledge cross-fertilisation is thus probably one of the key reasons for firms to engage at ITFs (Seringhaus and Rosson 1994, Ling-yee 2006). However, there is not a great deal of empirical research effort that has been spent on knowledge cross-fertilisation between firms engaging at ITFs, and equally little is known empirically about the influence of such cross-fertilisation in clusters.

When firms participate periodically at ITFs, they are repeatedly interacting with external knowledge which has been generated in totally different contexts. The importance for a firm to locate and acquire external knowledge at ITFs has become critical. Cohen and Levinthal (1990) introduced the concept of absorptive capacity to suggest the idea that the ability to spot, evaluate and employ external knowledge is largely a function of previously related knowledge. In clusters the previously related knowledge is associated with the processes where firms transform their knowledge, not only individually but also jointly (Pinch *et al.* 2003). In clusters, the ability to innovate and more specifically to acquire external knowledge is the result of the interactions, relations and collaboration between local actors and between

local and non-local actors in cluster networks (e.g. Johannisson *et al.* 1994, Giuliani and Bell 2005, Waxell and Malmberg 2006). In relation to local actors, clusters are here not only embedded in horizontal relations (i.e. across industry linkages to competitors) and vertical relations (i.e. linkages along the value chain). In clusters, local actors are also engaged in lateral relations between firms of non-related industries (Johannisson *et al.* 2002). Combining vertical, horizontal and lateral relations firms exchange knowledge conducive to idea generation and creation of opportunities across clusters.[25] Firms are also related to non-local actors in order to acquire extra-cluster knowledge (Giuliani 2007). Some of the relations between local actors and between local and non-local actors in clusters are stimulated at ITFs. Local actors jointly meet non-local actors at ITFs in order to build interpretative frames and adjust their relations. Local and non-local actors also convene regularly to instigate relationships at such events.

Knowledge cross-fertilisation triggered by the geographical and relational proximities of individual firms at ITFs must be associated with the overall cluster network in order to make the importance of such events understandable. This triggers a need for a more elaborated conceptual framework of proximity that will help our understanding of how clusters carry out knowledge cross-fertilisation by means of ITFs. The aim of this paper is thus to make a further conceptual contribution to and present empirical evidence of the understanding of the role of ITFs for prompting knowledge cross-fertilisation in clusters. Thereby, the following research question is asked: *How do clusters employ geographical and relational proximities* in order to realise *knowledge cross-fertilisation from ITFs to clusters?*

To answer this research question this paper is structured as follows. Section two introduces geographical and relational proximities. Section three discusses the conventional view of knowledge cross-fertilisation in relation to clusters. Section four resituates proximity in clusters addressing the influence of the knowledge cross-fertilisation originated at ITFs in a conceptual framework. Section five discusses the research methodology. Section six reports the findings and section seven presents the conclusions.

2. Geographical and relational proximities

Proximity plays an important role in innovation as it contributes to the cross-fertilisation of knowledge in firms, networks, clusters and ITFs (e.g. Boschma 2005, Torre and Rallet 2005, Bouba-Olga and Grossetti 2007). At ITFs firms build proximity to actors in different ways in order to engage in the cross-fertilisation of knowledge. Knowledge cross-fertilisation is conceptualised here as the unintended and intended consequence of dialogue,

reflection and observation of others when firms in clusters have a commitment to ITFs. Knowledge cross-fertilisation requires the ability of spotting, acquiring and rearticulating external knowledge by means of dialogical situations occurring at ITFs. Such cross-fertilisation also suggests the further translation, rearticulation and sharing of knowledge between partners with proximity between them in the cluster. Proximity has been researched employing different notions considered important for the cross-fertilisation of knowledge (e.g. Boschma 2005, Torre and Rallet 2005). Proximity is here studied by addressing its geographical and relational character within a time-frame (i.e. a permanent frame vs. a temporary frame). In particular, Torre and Rallet (2005) recently proposed to include the time frame in proximity.

Geographical proximity refers to the co-presence of firms, institutions, and people within a certain territorial reach.[26] Geographical proximity is a relative phenomenon; it is weighted by transportation cost and time and based on individuals' judgment of distance (Torre and Rallet 2005). It comprises the geographical distance to firms of the same and related industries (i.e. specialisation economies), to firms of different industries (i.e. diversification economies), and to associations, universities, research centres and public agencies (e.g. Capello and Faggian 2005). The time frame, in particular, is central in geographical proximity. The time frame introduces a dynamic character to geographical proximity, frequently materialised by the travelling of individuals and the accessibility to transportation means (Amin and Cohendet 2004). The need for face-to-face contact for deal-making, relationship adjustment, evaluation and socialisation brings people together through travelling (Storper and Venables 2004). Thus, firms benefit from a permanent geographical proximity as long as they operate in a cluster. The permanent geographical proximity facilitates the local diffusion of technological capabilities and know-how (Saxenian 1994). In contrast, distant firms participating in joint projects share a temporary geographical proximity for a short period of time when they travel to meet. Working by travelling has become more common between business people (Amin and Cohendet 2004). Thus, when co-presence between distant actors is needed, visits to offices or ITFs and intense meetings are arranged (Torre and Rallet 2005).

The sharing of permanent or temporary geographical proximity does not guarantee that firms interact and co-operate with each other. Collaboration and relations are an outcome of relational proximity. Relational proximity refers to the existence of multi-stranded relations in which the same firms,

[26] In this study, institutions correspond to organizations that support local activities without making profits. Some examples are producer associations, unions, chambers of commerce, research centres, educational institutions, and government agencies. Institutions also include local organisations such as church groups, rotary clubs, and sports clubs.

institutions and individuals are 'embedded' in networks for different purposes (Wasserman and Faust 1994, Johannisson *et al.* 1994). Multi-stranded relations foster closeness in as much as they permit distance between parties in networks. The networks include a mixture of market and embedded relations to secure a relational proximity but also a relational distance between firms. In other words, the 'multiplexity of a relation' stands for the multiple strands that a relation between two actors can show (Wasserman and Faust 1994). It denotes that the ability of building relations among firms, institutions and people is recurrent, embracing different strands concurrently, but also changes over time (Larsson 1992, Ring and Van de Ven 1994).

Let us consider a relation between two individuals in two firms. This relation may have two strands, doing business and collaborating in a newly launched R&D project. The two individuals start socialising while working together in the R&D project, and thereby they are building social bonds. Thus, they initiate a third strand in their relation, that is, they become friends. Once the specific project and commercial operations are terminated, they distantiate themselves from each other. The firms' capacity to be associated in commercial activities and/or joint R&D projects becomes latent and is activated if needed (e.g. Grabher and Ibert 2006). If either of them needs to find a partner for a new R&D project, they phone their old colleague to get advice on suitable candidates. Alternatively, when they happen to meet at an ITF, they update themselves on each other's activities and can create new joint opportunities. These features are crucial, as they imply that actors can distantiate themselves from a strand of a relation or a relation that does not contribute at all to the development of a firm. Yet, an individual working in a firm or an organisation can *re-activate* the strand or the relation *when and if* there is an interesting turn in the activities of the actor in question. This means personal networking that is activated spontaneously or when needed (Johannisson *et al.* 1994). Such personal relating indicates that business actors combine social and business concerns in individual relations, thereby creating opportunities for their firms (Johannisson 2000).

In contrast, other literature suggests that the different strands contained in a relation should be separated. Giuliani (2007) has proposed, for instance, the separation between the so-called business network of relations and the knowledge network of relations in a cluster. However, firms realise multiple strands simultaneously in a single relation (e.g. Johannisson *et al.* 2002). Other literature states that the multiplexity of relations in networks is central for entrepreneurship c.f. Johannisson *et al.* 1994 and innovation c.f. Håkansson 1987. It is when those strands exist in a relation that the array of possibilities is created and they will be considered accordingly. The multiplexity of relations stems from a logic of similarity and a sense of belonging between people. The 'logic of similarity' (Torre and Rallet

2005:50) indicates that relations between firms, institutions and/or people are characterised by the same system of representations, values or sets of beliefs. Being similar facilitates collaboration, co-ordination and knowledge exchange among firms, institutions and people (Capello and Faggian 2005). Firms, institutions and people build a sense of belonging based on shared norms, technical language, routines or common interests. The logic of similarity and a sense of belonging enable the persons in firms and institutions to communicate and build multi-stranded relations.

The time frame is also central in relational proximity. Firms located in a cluster share a more or less permanent relational proximity through their networks. They invest in building trust and maintaining collaborative linkages to other firms (Saxenian 1994). Conversely, firms that engage in partnerships share a temporary relational proximity. When two firms launch a partnership, they establish a non-disclosure agreement for a specific period of time (Bathelt *et al.* 2004). When the specific partnership is terminated, social strands are built between actors in the firms. These strands can be reactivated in future partnerships or collaboration by email or video conference over long distances. In sum, relational proximity offers a powerful mechanism of both short and long distance co-ordination within a time-frame dimension that constitutes the foundation of increasing socio-economic interactions and collaboration around the world. Firms produce innovations by combining geographical and relational proximities for knowledge cross-fertilisation. The next section therefore addresses how geographical as well as relational proximities are used for such purposes in clusters.

3. The conventional view of proximity employed for knowledge cross-fertilisation in clusters

The conventional view of proximity in clusters is that the existence of a permanent geographical proximity and a permanent or a temporary relational proximity fosters knowledge cross-fertilisation. In clusters the channels used for realising knowledge cross-fertilisation are relations, collaboration and partnerships between firms and institutions (e.g. Johannisson *et al.* 1994, Giuliani and Bell 2005). These channels are manifested in two ways: (1) as unintentional and spontaneous knowledge leaks and (2) as intentional and systematic knowledge flows.

The unintentional and spontaneous knowledge leaks, constituting *the first road to cross-fertilisation*, occur between firms because of their relations and/or collaboration in the same and related industries. These leaks are acknowledged in the literature as knowledge spillovers (Audretsch and

Feldman 1996, Hörte 2004). Such leaks circulate freely 'in the air' as a public good (Marshall 1920, Arrow 1962). Knowledge as a public good implies that firms cannot protect the knowledge with patents or conceal it for the use of others, and thus others can benefit from it in their own innovation activities (Karlsson *et al.* 2004). Employee recruitment, spin-off initiatives and friendship relations are the usual channels stimulating such activity (e.g. Almeida and Kogut 1999, Capello and Faggian 2005). In relation to employee recruitment Almeida and Kogut (1999) studied the employee mobility across the US of engineers holding patents. The mobility of engineers between firms was relevant for knowledge cross-fertilisation in Silicon Valley. One interpretation of their results was that the mobility of engineers within a region and to other regions was made possible through a partially visible network.

Johannisson *et al.* (1994) conducted a pioneering study on cluster networks. In their study of Gnosjö, a Swedish cluster, these authors signal that networks of multi-stranded relationships were important channels for sharing experience, connecting new people and realising new businesses with local and non-local firms. The geographical proximity of friendship relations facilitated the sharing of a community sense resulting in unintended knowledge cross-fertilisation. Such friendship relations make it easy to pick up relevant topics of conversation at planned or unplanned encounters and to establish further regular collaboration. According to Keeble *et al.* (1999), the rules of behaviour embedded in the social relations guarantee the standards of behaviour which engender trust and collaboration.

In relation to the relevance of knowledge leaks for innovation Baptista (2000), using UK data, showed that the location of previous adopters of technology fosters the probability of other local firms adopting such technology. One of the interpretations of his results was that knowledge leaks, associated with technical knowledge, were geographically localised. In a similar vein, Capello and Faggian (2005) demonstrated that employee recruitment and collaboration with suppliers and customers were important channels for disseminating innovation-related knowledge between firms in the Veneto region. While the significance of the labour market was studied, focusing on the percentage of new employees belonging to a local area, the contribution of the collaboration with local suppliers and customers was weighted by every manager. Even if their study only matched innovation with the percentage of turnover spent in R&D activities, it confirmed the relevance of such 'collective channels' for local knowledge cross-fertilisation when firms had an affiliation to an area.

The intentional and systematic flows, constituting *the second road to cross-fertilisation*, occur between firms because of their relations and partnerships in the same and related industries. In clusters the geographical proximity

permits firms to monitor others for benchmarking purposes. Firms monitoring local competitors with similar capabilities take up the experiments of rivals at hardly any cost (Malmberg and Maskell 2002). These activities often begin as an imitation process, but they involve the development and the conceptualisation of the acquired knowledge in accordance with local conditions. Massa and Testa (2004) found that small and medium-size firms in the maintenance industry in Italy regularly studied external practices and performance. They compared such practices with internal ones and thus found knowledge gaps. These firms subsequently changed their routines and invested in the necessary resources generating innovation in products and processes.

In relation to the intentional and systemic collaboration conducive to the creation of mainly technical knowledge Giuliani and Bell (2005) researched the dissemination of external knowledge by means of intentional co-operative behaviour in a local knowledge network (LKN). These authors asked the firms to identify the most significant incoming technical knowledge flows. The firms agreed in that external partners were important sources of support when technical help was required. Giuliani and Bell (2005) demonstrate that external technical knowledge was commonly spread in an uneven and highly selective manner through LKN partners in a Chilean Wine cluster; c.f. also Giuliani (2007). According to Giuliani (2007), firms with a strong knowledge basis possessed the incentive to transfer knowledge and were in a condition to reciprocate such transmission.

To sum up, while the leaks secure the involuntary, spontaneous and free circulation of knowledge, the selective flows guarantee its continuous renewal. The existence of knowledge leaks and knowledge flows generates a balanced situation in knowledge cross-fertilisation efforts in clusters. In what follows it will be addressed how firms combine their use of temporary proximity (ITF participation) and permanent proximity (affiliation to cluster networks) for instigating knowledge cross-fertilisation.

4. A conceptual framework for reconsidering proximity and knowledge cross-fertilisation in clusters by means of ITFs

Knowledge cross-fertilisation in clusters is a complex and time-consuming process here associated with the proximity of innovation activities originating at ITFs. The role of ITFs in fostering knowledge cross-fertilisation and building proximity is anchored in the organising context of clusters. The notion of the organising context was introduced by Johannisson (1988). It is defined as an enacted collaborative environment in which firms

co-create their own development conditions (Johannisson 1994). This co-creation of development conditions means that firms enhance their social and business activities, influencing one another in order to promote local entrepreneurial processes. Such processes promote the potential creation of new or improved products and processes. Thus local entrepreneurial processes are furthered by firms' interactions, relations and collaborations in their organising context (Johannisson 2000). This suggests that the organising context accentuates the role of clusters as a support for knowledge cross-fertilisation in order to renew continuously firms (and clusters); this is however not necessarily restricted to clusters. The organising context can be defined territorially (e.g. limited to a cluster), functionally (e.g. global value chains), virtually (e.g. global networked structures) or demarcated by a combination of them (Johannisson 2000, Johannisson *et al.* 2002a).

The organising context, being socially, historically and culturally embedded, is manifested in networks (e.g. Johannisson *et al.* 2002a). Thus, when cluster firms participate at ITFs, they stretch their networks combining the geographical, relational, permanent and/or temporary proximities to realise knowledge cross-fertilisation. To this purpose the framework developed as follows consists of three 'orders' of interaction and collaboration in which knowledge cross-fertilisation takes place (see table 1). The capacity of co-operating among individuals and firms in particular will be considered here. This framework constitutes a step ahead from the previous conceptualisation of geographical and relational proximities (see Ramírez-Pasillas 2007). The framework here incorporates the materialisation of new or improved products and processes in the cluster as a result of the knowledge cross-fertilisation originated at ITFs.

The first order, intra-cluster proximity, is the co-existence of a permanent geographical proximity and a permanent relational proximity between individuals and firms.[27] The permanent geographical proximity induces the dissemination of collective learning processes and the development of innovation. A permanent relational proximity in clusters highlights the existence of horizontal, vertical and lateral multi-stranded relations serving innovation purposes. Multi-stranded relations in clusters mirror the social embeddedness of economic activities (Granovetter 1985, Uzzi 1997). The social embeddedness facilitates the exchange of tacit knowledge in networks of relations, which is more difficult to trade in markets. This may occur with or without a relational proximity. In Table 1 two multi-stranded relations are considered: *'local partnerships' and 'local personal networking'*.

[27] This statement does not mean that local relations last forever, but it does mean that once they are established, they tend to last long (e.g. Uzzi, 1997).

Table 1. A proximity framework for the cross-fertilisation of knowledge

Proximity	First order Intra-cluster proximity	Second order ITF Proximity	Third order Holistic proximity
Feature	Permanent geographical co-location among firms which are sharing a relational proximity	Temporary geographical co-presence among firms engaging at ITFs which are employing a permanent or temporary relational proximity at such events	Permanent geographical co-location among firms which are also sharing a relational proximity and are producing innovations after ITFs
Kinds	• Local partnerships • Local personal networking	• Local partnerships activated at ITFs • Local personal networking utilised at ITFs • New trans-national partnerships found at ITFs • Existing trans-national partnerships encountered at ITFs	• Multi-stranded relations between local firms participating at ITFs and between firms participating at ITFs and local firms not engaging at ITFs

(Source: Elaboration of Ramírez-Pasillas 2007, table 2, p. 107)

These multi-stranded relations result from the literature reiterating how innovation should be considered a product of a network of relations (e.g. Håkansson 1987). The first multi-stranded relation, '*local partnership'*, indicates a situation where a firm establishes a strategic alliance with another firm in business and collaboration over innovation. Firms engage in calculated local partnerships in cases where supplementary knowledge and skills based on market conditions (and without social embeddedness) are searched for. This approach is largely strategic (Gulati *et al.* 2000). Firms only establish a local partnership when the vulnerability of allying can be held at a tolerable level. Firms turn to partnerships to exchange knowledge, mobilise resources and relate to specialised actors. The second local multi-stranded relation mentioned here is '*personal networking'* (Johannisson *et al.* 1994). Personal networking addresses multi-stranded relations sharing business and innovation purposes where social embeddedness is the basis for

a relational proximity. Personal networking carries the sense making guiding the entrepreneur in the realisation of its firm; it includes the human rationale, emotions and intuition fostering the continuous organising of people and resources (Johannisson 2000). Personal networking contributes to the enactment of a collaborative environment encouraging intended or unintended knowledge cross-fertilisation and habitual local entrepreneurship by means of mutual commitment and spontaneity.

The second order is the ITFs proximity; it refers to the dialogical situations occurring between colleagues at ITFs embedded in local and trans-national relations and partnerships.[28] Increasingly, ITFs have become a fashionable activity, as they combine work and fun. At ITFs firms perform their jobs while enjoying the conviviality of the exhibition, dinners and tourist activities with colleagues, partners and even competitors. This conviviality stimulates the unintended or intended dialogical situations initiated at ITFs for the cross-fertilisation of knowledge (i.e. conversations, meetings, seminars, lectures and reflection). At ITFs many European booths have their own conference rooms and lounges where contacts are created with the help of snacks, drinks, lectures, seminars and presentations (Tesar 1988). The seminars and lectures arranged by the firms have two purposes: they provide a platform for exchanging information between customers and suppliers, and they offer an arena for displaying product information aimed at particular target groups (Ling-yee 2006). In the booths firms also attend the presentation of new or improved products. They participate in product hands-on experience (Seringhaus and Rosson 1994). Firms also discuss product designs, product functions, product improvements and often products failures. These dialogical situations often begin as an exchange of knowledge followed by making sense of such knowledge; they then result in multiple forms of rearticulation and recombination of the acquired knowledge with reference to previously related knowledge, c.f. Weller, 2007. However, there are a variety of occasions for engaging in dialogical situations at ITFs; these dialogical situations also vary depending on the size and strategy of the firm and on the partners that firms plan to meet or happen to get in touch with. In Table 1 four relationships are considered which capture some of the dialogical situations occurring at ITFs: '*local partnerships'*, *'local personal networking'* and *'new trans-national partnerships'* and *'existing trans-national partnerships'*.

The first kind of dialogical situation is triggered by local partnerships activated at ITFs, local partnerships here referring to the existing ones employed at ITFs for the purpose of sharing information on the company's recent activities, products or plans. Encounters between partners often occur spontaneously or planned at dinners and seminars of ITFs (Maskell *et al.*

[28] Trans-national relations refer here to non-local foreign linkages.

2006). In such encounters firms reinforce the relation to those partners with whom they have carried out business transactions beforehand (Ling-yee 2006). Partner firms visit each other's booths, observe and talk about each other's novelties and make almost immediate comparisons. *A second kind of dialogical situation* is triggered by local personal networking utilised at ITFs; it addresses those situations in which a meeting is arranged between a local personal contact and a trans-national partner in order to discuss R& D and technology, products, training and marketing activities. This proposition stems from the relational view of knowledge-sharing literature proposing that firms learn not only from their own direct experience, but also from the experience of others (Huber 1991, Dyer and Singh 1998). Short and intense encounters between partners are held to optimise resources and the cost of meetings (Torre and Rallet 2005). At their encounters firms share interpretative schemas and build new understandings.

The third and fourth kinds of dialogical situations are triggered by new and existing trans-national partnerships. The literature on clusters emphasises the benefits of formal partnerships in marketing, manufacture and R&D. 'Trans-national partnerships' here correspond to proprietary pathways for directed transfers of information and resources that give significant advantages to associates. According to Bathelt *et al.* (2004), when firms find a potential trans-national partner, they decide how much information should be disclosed to the partner and to what degree the activities of the partner will be monitored. However, it is important to consider that building a partnership is a process continuing after ITFs (Rice 1992). For this reason trans-national partnerships are divided into new and existing trans-national partnerships. In these partnerships firms are induced to exchange ideas, get inspiration and form new interpretations through socialisation at ITFs. Through the development of trans-national partnerships firms engage in ongoing dialogical situations realising knowledge cross-fertilisation. These dialogical situations convey the sharing of information, joint sense-making and developing relation-specific memories (Selnes and Sallis 2003). These activities constitute the foundation for translating and recombining knowledge.

The third order, holistic proximity, is an activity linking the two previous orders of proximity at the cluster, identifying those local relationships and local partnerships in which at least one of the firms introduces product or process innovations after having participated at ITFs. At the ITFs firms obtain new interpretations and understandings of the acquired knowledge, which will be profoundly different from knowledge being developed in local contexts (Carbonara 2004). Those interpretations and understandings help firms to make strategic decisions about fashion, business practices and activities in marketing, finance, production and R&D. This triggers the further adaptation and rearticulation of the acquired knowledge according to

previously related knowledge, ultimately generating product or process innovations. In the cluster the relations and collaborations for the purpose of innovation provide potential occasions for amplifying knowledge cross-fertilisation. Locally, firms converse, observe and reflect upon their business practices, technologies and products, generating the continuous renewal of firms and clusters.

5. Research methodology

This paper relies on a case study method (Yin 1984) to study how firms employ geographical and relational proximities for realising knowledge cross-fertilisation originating and continued at ITFs. Social network analysis provides a tool for mapping such cross-fertilisation in a cluster, which is the primary unit of analysis. This means that an 'embedded design' is adopted by aggregating the relationships and dialogical situations realised by firms inside and outside the cluster. The data analysis is carried out using the SPSS computer package and UCINET 6.51 (Borgatti *et al.* 2002). In order to solve the research question five methodological subtasks are dealt with:

- *presenting the empirical base, i.e. the Lammhult cluster;*
- *operationalisation the proximities relevant for knowledge cross-fertilisation in the cluster;*
- *introducing the operationalisation of the intra-cluster proximity;*
- *discussing the operationalisation of the ITF proximity; and*
- *presenting the operationalisation that resituates the holistic proximity considering the influence of ITFs.*

5.1 The empirical base: the Lammhult cluster

The Lammhult cluster was chosen for this case study because it has enacted a collaborative environment in which the local and the global contexts converge in a cluster network (Johannisson *et al.* 2002). The Lammhult cluster, located in southern Sweden, is dominated by the furniture industry (see Figure 1). In the last few decades, the furniture production has incorporated new materials with the support of information and communication technologies. Manufacture planning systems combined with control numeric machines, groupware and computer-aided designs (CAD) have facilitated the creation of new markets, ergonometric styles and environmental-friendly designs. The codification of knowledge from engineering drawings to CAD files has prompted the formation of a local knowledge basis supplemented with non-local relations.

Figure 1. Locating Lammhult in Northern Europe

In Lammhult there are about one hundred businesses, whereof 37 were considered in this study. The data collected was not based on a sample. First, 31 firms were selected for this study because of our privileged access to the local trade association. The remaining six were found in the phone directory. The 31 firms answering the survey are located in Lammhult or its surroundings. Of the 31 local firms 16 belong to the furniture and furniture-related industries, some of them being nationally and trans-nationally renowned. As a group they lead private local employment and R&D investment. The remaining 15 local firms are quite heterogeneous members of non-related industries (i.e. financial services, window producer, fire equipment producer, security equipment trading).

5.2 Operationalisation of the proximities relevant for knowledge cross-fertilisation in the cluster

Data was collected in a survey addressing the (owner) managers of the firms in 2005. All managers were asked questions about their personal and firm networking activity with their local colleagues for the 2002-2004 period. Each business person obtained a roster of the local firms and was asked to indicate the firm's interaction and collaboration with every other firm on different kinds of strands. The data on every strand is expressed in matrices.

Each matrix is composed by 31 rows and 31 columns, 31 being the number of firms participating in the study. This paper network uses five strands (or five 31x31 matrices) to operationalise the geographical and the relational proximities employed for knowledge cross-fertilisation. Table 2 shows the specific four strands included in this operationalisation.

Table 2. Defining the proximity strands

Strands	Operationalisation
Social	
Acquaintance	The CEO or someone else in senior management and/or on the board of the firm is personally known.
Talk	A face-to-face or telephone meeting was held with the senior management of the firm within the last 30 days. The conversation is to have lasted for at least five minutes and concerned things other than the weather.
Business	
Commercial	Some business (concerning goods and/or services) has been transacted (including lending, borrowing and barter) with the firm in the past year.
Innovation	
Joint experimentation aiming at innovation	There has been collaboration involving the firm and aiming at innovation of R&D and technology, new/improved products, new/improved processes, training and marketing/exporting.

(Source: Elaborated from Johannisson *et al.* 2002, table 2, p. 229)

The *social strands*, acquaintance and talk, account for the social embeddedness in the cluster. The social embeddedness facilitates the exchange of tacit knowledge in networks of relationships, which is more difficult to trade in markets (Granovetter 1985, Uzzi 1997). The idea here is that individuals often establish a personal acquaintance for instrumental reasons varying from camaraderie, information access to status enhancement Once the tie is initiated it is likely to build trust, loyalty and commitment (Westphal *et al.* 2006). Personal acquaintances and regular talks signify occasions for engaging in knowledge leaks. The *business strand* indicates the commercial transactions realised between firms to exchange standardised or specialised components and services. The *innovation strand* is operationalised as joint experimentation aiming at innovation. This strand captures the shared innovation activity in the cluster. Innovation here means 'the search for, and the discovery of experimentation, development, and imitation, and adoption of new products, new processes, and new organisational set-ups' (Dosi 1988:222). Joint experimentation includes the realisation of organisational experiments, the attempts to solve problems or the unexpected and unsystematic creation of knowledge (Huber 1991).

5.3 Operationalisation of the intra-cluster proximity

This section presents the intra-cluster proximity as a network channeling innovation-related knowledge by means of a permanent geographical proximity and a temporary relational proximity. To operationalise these proximities the four above-mentioned strands are combined in order to generate two distinctive multi-stranded relations: local partnerships and local personal networking, as summarised in Table 3.

Table 3. Operationalising the cluster network

Multi-stranded relation	Operationalisation
Local partnership	Coinciding 'commercial' and 'joint experimentation aiming at innovation' strands (but not 'acquaintance' and 'talk' strands).
Local personal networking	Coinciding 'commercial' and 'joint experimentation aiming at innovation' strands with 'acquaintance' and 'talk' strands.

Note: For conceptualisation see table 1.

The local partnerships combine commercial operations and joint experimentation aiming at innovation in one multi-stranded relation. A firm establishes a local partnership in cases where supplementary knowledge and skills are searched for on the basis of market conditions (and without social embeddedness). The local personal networking indicates a multi-stranded relation that brings together friendship, commercial and innovation purposes (Johannisson *et al.* 2002). In these relations firms are mutually connected by means of personal acquaintances, regular dialogues and pervasive knowledge cross-fertilisation activities. Altogether, these multi-stranded relations are linked in a network (further addressed as a cluster network). This cluster network is anchored in the channels used for knowledge cross-fertilisation, which provide occasions for engaging in the identification, exchanging and, ultimately, recombination and rearticulation of knowledge. These channels are relevant because they carries with them conversations, reflections and actions for producing continuous renewal in the individual firm and cluster. The overall affiliation to this network is estimated by means of its density. Network density means the proportion of the relations that are realised with respect to the total number possible, ND = n(n-1)/2, n being the number of nodes in the network (Wasserman and Faust, 1994). When calculating the density of the network, we distinguish between the overall cluster network and the furniture subcluster network. The overall cluster network includes horizontal, vertical and lateral relations in agreement with our definition of clusters. The furniture subcluster network meets the traditional definition of a cluster including horizontal and vertical networks.

5.4 Operationalisation of the ITF proximity relevant for knowledge cross-fertilisation

The managers were asked a set of questions regarding their use of geographical and relational proximities at ITFs in the previous three years. Within a combined temporary geographical proximity and a permanent relational proximity the firms were also asked about their interaction with local firms at ITFs. These interactions correspond to the local partnerships and local personal networking activated at ITFs. Within a temporary geographical proximity and a temporary relational proximity the frequency at which firms established and maintained trans-national partnerships at ITFs was estimated. New and existing trans-national partnerships correspond to collaborations with foreign contacts that are significant for knowledge cross-fertilisation. They bring with them knowledge that is generated in totally different contexts. Table 4 summarises these relations.

Table 4. Building geographical and relational proximities at ITFs

Multi-stranded relation	Operationalisation
Temporary geographical proximity with permanent relational proximity	
Local partnerships activated at ITFs	The firm meets with other local partners during an ITF and by this means is informed about the company's activities/products/plans.
Local personal networking utilised at ITFs	The firm meets with a trans-national partner and a local firm at an ITF to discuss R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs.
Temporary geographical proximity with temporary relational proximity	
New trans-national partnerships found at ITFs	The firm finds suitable trans-national partners of R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs.
Existing trans-national partnerships met at ITFs	The firm meets with an important trans-national partner to discuss R&D and technology, new/improved products, new/improved processes, training and marketing/exporting at ITFs.

5.5 Operationalisation of the intra-cluster proximity resituated by means of ITF influence

The intra-cluster proximity is resituated considering the influence of ITFs in the innovation activities of the cluster network. We first estimate the density of the cluster network. In the cluster network we then consider those situations where 'firms that frequently introduce new or improved products/processes as a result of ITFs' are interacting with other local firms

which are *and are not* engaged at ITFs. These relations provide channels for knowledge cross-fertilisation in the cluster. We define 'the firms that frequently introduce new or improved products/process as a result of ITFs' as the firms that: (1) participate at ITFs, (2) meet with new and existing trans-national partners at ITFs, (3) convene with other local firms at ITFs and (4) frequently introduce new or improved products/processes after having participated at ITFs. In relation to this firms were asked about the frequency at which they introduced new or improved products/process as a result of ITFs, using a 1-5 'Likert-type' scale (i.e. always, very often, sometimes, rarely, never). A proxy variable was then created with those firms which answered that they have introduced new or improved products/process always and very often. With this overall data, we have created a two-mode matrix. This matrix has 31 rows by 4 columns, where 31 represent the number of firms and 4 accounts for the control variables. This analysis aims at identifying the channels that help in the cross-fertilisation of innovation-related knowledge, channels which materialise in new or improved products and processes in the cluster. The analysis identifies four situations:

1) The firms frequently introducing new or improved products/process as a result of ITF participation and realising a local partnership – but no other type of multi-stranded relation – with other local firms that do not participate at ITFs.
2) The firms frequently introducing new or improved products/process as a result of ITF participation and engaging in local personal networking – but no other type of multi-stranded relation – with other local firms that do not participate at ITFs.
3) The firms frequently introducing new or improved products/process as a result of ITF participation and realising a local partnership – but no other type of multi-stranded relation – with other local firms that participate at ITFs.
4) The firms frequently introducing new or improved products/process as a result of ITF participation and engaging in local personal networking – but no other type of multi-stranded relation – with other local firms that participate at ITFs.

6. Findings

6.1 The intra-cluster proximity: the Lammhult network

The Lammhult network is introduced in terms of the permanent geographical proximity and the permanent relational proximity activated for innovation purposes. Table 5 distinguishes between the density of the overall Lammhult network and that of the furniture subcluster network. The overall Lammhult cluster reports 2% local partnerships (i.e. 9 relations out of 465 possible), while the furniture subcluster reports 5.8% partnerships (i.e. 7 relations out of 120 possible). These percentages indicate the number of partnerships that are formed combining complementary knowledge and skills to reach innovation. Such low numbers, however, suggest that the cluster (as well as the subcluster) operates in a collaborative environment that allows firms to interact without a need for formalisation. The proportion of local personal networking activities between local firms in the furniture subcluster is denser than in the overall cluster, 11.4 % 'local personal networking' activities between firms being present in the overall cluster (i.e. 53 relations out of 465 possible), whereas 24.2 % 'local personal networking' activities with firms are realised in the furniture subcluster (i.e. 29 relations out of 120 possible). This number indicates that the joint innovation activity favours relations characterised by the social embeddedness within the cluster.

Table 5. The Lammhult cluster network

Multi-stranded tie characteristic	Overall cluster (1)	Furniture subcluster (2)
Local partnership	2.0	5.8
Local personal networking	11.4	24.2

Notes:

(1) The numbers correspond to the network density, i.e. the percentage of relations realised out of 465 total possible (i.e. 31x(31-1)/2) in the entire cluster in the 2005 survey.

(2) The numbers correspond to the network density, i.e. the percentage of relations realised out of 120 total possible (i.e. 16x(16-1)/2) in the 2005 survey.

The visualisation of this network in Figure 2 plots the collective efforts to innovate sustained between firms. The isolated cases are linked to the network by means of personal acquaintances and commercial operations.

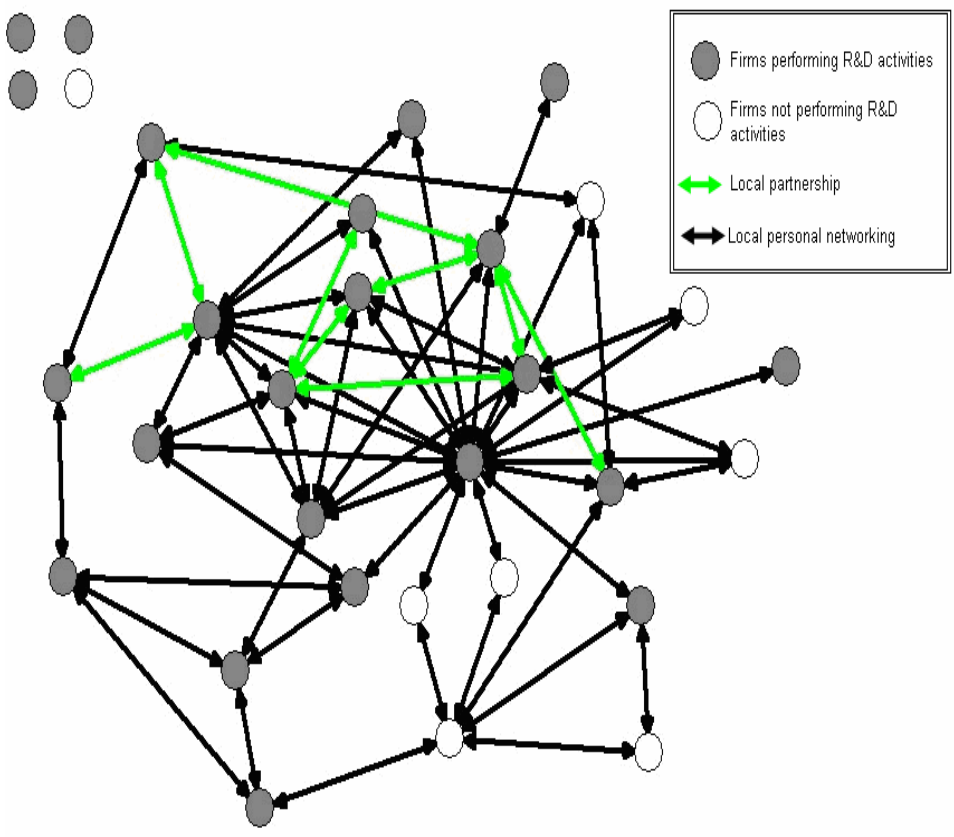

Figure 2. The Lammhult cluster network

6.2 ITF proximity relevant for knowledge cross-fertilisation

Table 6 reports the geographical and the relational proximities of the Lammhult cluster utilised at ITFs. Participation at ITFs means that firms attend these as 'visitors' and/or as 'exhibitors'. Annually 13 firms attend as visitors to two ITFs on average. Ten firms exhibit their products at three ITFs on average. There are 13 firms which have met other local partners at ITFs. This number implies that local firms employ their ITF participation as a mechanism to inform themselves about the products and activities performed by other local firms. Furthermore, 11 of the Lammhult firms reported meeting concurrently with a trans-national partner and a local firm at such events. These meetings indicate the potential joint efforts made to build new understandings and interpretations of technological novelties and fashion trends relevant to the firms and their cluster. At ITFs more experienced firms can introduce younger local firms to potential partners. Firms can also realise

joint offers to foreign customers in order to gain market access. Such numbers indicate that these firms use ITFs as a platform for sustaining and renewing their local and global networks. At ITFs firms activate their temporary geographical proximity to sustain the temporary relational proximity significant for innovation purposes. Nine firms reported having obtained new trans-national partnerships at ITFs. These numbers suggest that the specialisation of the vertical ITFs ensured finding the right people and firms for building an innovation capacity. Of the Lammhult firms 11 indicated celebrating a meeting with their existing trans-national partners at the events. These meetings were used specifically for issues associated with innovation.

Table 6. Building geographical and relational proximities at ITFs

Characteristic	**Lammhult firms attending ITFs (13 firms)**
• Proportion of sample of Lammhult firms that participates at ITFs (%)	38.7
• Average attendance at ITFs as visitors per year (1)	2 (13.0)
• Attendance at ITFs as exhibitors per year (2)	3 (10.0)
Temporary geographical proximity with permanent relational proximity	
• Local partnerships activated at ITFs	13
• Local personal networking utilised at ITFs	11
Temporary geographical proximity with temporary relational proximity	
• New trans-national partnerships found at ITFs	9
• Existing trans-national partnerships encountered at ITFs	11

Notes:
1) Average attendance as visitors with the number of firms joining ITFs in parenthesis.
2) Average attendance as exhibitors with the number of firms displaying their products at ITFs in parenthesis.

6.3 Holistic proximity resituated by means of ITF influence

Table 7 reports the multi-stranded relations characteristic of firms that frequently introduced new or improved products/processes after having engaged at ITFs. The resulting number of local partnerships indicates that the collaborative efforts between firms participating at ITFs and firms that do not are slightly bigger than the partnerships between firms engaged at ITFs. Three local partnerships are realised between firms participating at ITFs and firms that do not (i.e. 3 out of 9 partnerships). In contrast, 6 local

partnerships are carried out between firms participating at ITFs (i.e. 6 out of 9 partnerships). These numbers indicate the complementarities occurring between firms with regard to jointly producing new or improved products. Such low numbers of partnerships reflect that firms realise such partnerships because of their specialisation and the potential strategic nature of their collaboration. It also indicates that firms prefer relations characterised by social embeddedness. Thus, 33.96 % of the personal networking activities are shared among firms participating at ITFs and firms that do not (i.e. 18 out of 53 relations) while 45.28% of the existing personal networking activities are shared between the firms participating at ITFs (i.e. 24 out of 53 relations). These resulting percentages indicate that local personal networking activities between firms participating at ITFs are more frequent than the local personal networking between firms participating at ITFs and firms that do not. Above all, these relations correspond to the persistent interaction for the location, adaptation, and blending of the acquired knowledge with the re-use and reference of previously related knowledge.

Table 7. Resituating proximity in the Lammhult cluster network through ITFs

Association to ITFs	*Type of multi-stranded relation*		*Total*
	Local partnership (1)	Local personal networking (1)	
Firms participating at ITFs interacting with firms not participating at ITFs	33.3 (3)	33.9 (18)	21
Firms participating at and interacting between ITFs	66.6 (6)	39.6 (22)	28

Notes: The percentages in all these boxes indicate the proportion of multi-stranded relations of the densities estimated in Table 5.

Furthermore, the total number of relations and partnerships between firms participating at ITFs (i.e. 28) is relatively close to the relations and partnerships between firms participating at ITFs and firms that do not (i.e. 21). This situation creates a balance in the efforts for knowledge cross-fertilisation instigated at ITFs and continued in the cluster network. In addition, firms not engaging at ITFs also collaborate with other firms not engaged at ITFs (see Figure 3); these firms also benefit indirectly from the channels carrying novelties from ITFs. The overall cluster efforts are important because they imply local joint efforts to converse on, reflect and understand what is occurring in their global industries in a relaxed setting where double-loop learning can occur.

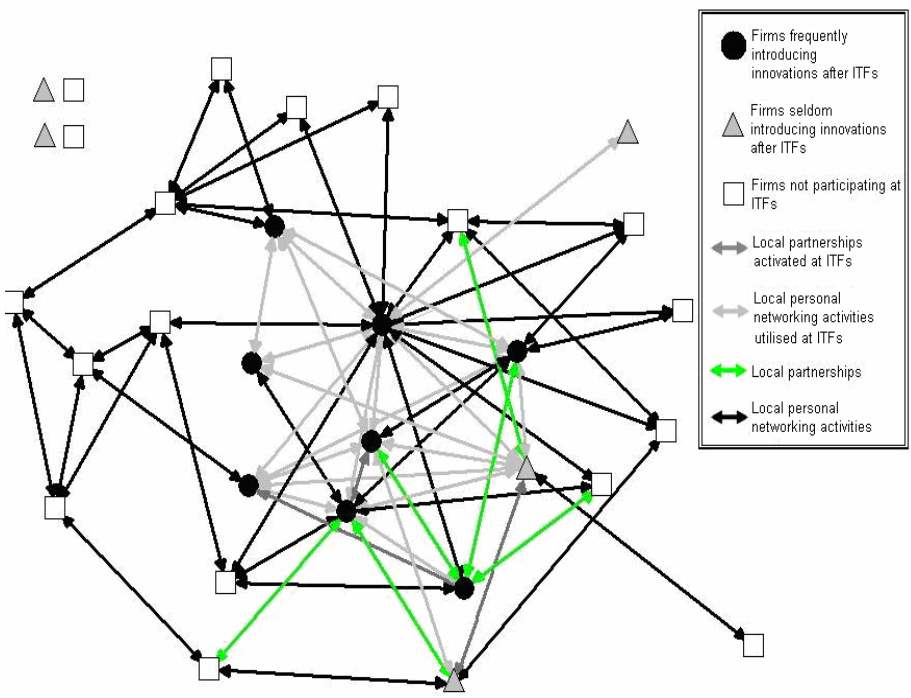

Figure 3. Proximity and knowledge cross-fertilisation resituated in the Lammhult cluster network

7. Conclusions

A dominant view in the literature is that clusters combine geographical and relational proximities to channel knowledge cross-fertilisation manifested in the form of unintentional knowledge leaks and intentional knowledge flows in networks. These networks build a vibrant environment characterising their clusters. Furthermore, this view suggests that the existence of knowledge leaks and knowledge flows enhances the likelihood of firms learning and making innovations when they are located in clusters (Baptista 2000, Capello and Faggian 2005, Giuliani 2007). This study has taken an alternative road, focusing on how firms employ geographical and relational proximities for prompting knowledge cross-fertilisation from ITFs to clusters (and within clusters). This is in line with the studies suggesting that ITFs influence the renewal of networks that eventually favour cluster innovation (Maskell *et al.* 2006). A number of studies indicate that firms locate and acquire external knowledge that has been developed in different contexts (Cohen and Levinthal 1990). Then knowledge is recombined, reused and rearticulated with previously related knowledge, which is then disseminated in clusters (Carbonara 2004, Giuliani and Bell 2005). This study has contributed to this

direction in research and has argued that knowledge cross-fertilisation is instigated at ITFs and further continued in cluster networks. Using relational data aggregated in a Swedish cluster and social network analysis, this paper has empirically shown that ITFs play an important role in stimulating the innovation activity in a cluster network. This study further illustrates that at the intra-cluster proximity order, the cluster network combines local partnerships and local personal networking activities serving innovation purposes. At the ITF proximity order 13 firms of the cluster network participated periodically at ITFs. Eight of those firms frequently introduced innovations after having participated at ITFs. Thus, when resituating the holistic proximity, these firms were inter-connected by means of multi-stranded relations with other firms participating at ITFs and with firms that did not. These multi-stranded relations ensured the continuous knowledge cross-fertilisation efforts in the cluster network.

Firms located in the Lammhult cluster network showed their compromise to ITFs by repeated and periodic attendance at such events. These events gather the most important actors in an industry, including buyers, suppliers, associations, universities, public agencies journalists and the general public (Godar and O'Connor 2001). For this reason firms try to get the most out of their participation at ITFs. Firms in the Lammhut cluster network attended both as visitors and exhibitors. They used such events to meet local and non-local actors. The intensity triggered by events lasting only for a couple of days fostered an environment that allowed firms to convene safely with local and non-local partners. The meetings were performed to discuss issues relevant for innovation. As these discussions involve the concentration of the newest products and the most advanced technologies presented at ITFs, the firms were stimulated to converse on the coming challenges, the problems faced and the ways to go about their businesses.

The study undertaken here has shown that knowledge cross-fertilisation was not only instigated by the firms engaged at ITFs. When resituating the holistic proximity, local partnerships and local personal networking activities linked firms participating at ITFs and firms that did not. This outcome is important because it indicates that not all firms have the commitment or the financial means to engage at ITFs. These firms, however, were updated on what was happening in their global industries via their local partners. As their partners continued to buy their products or services, they could perceive the need of creating or improving their products (or processes) in order to sustain the multi-stranded relations with their local customers. The continuous interaction for the adaptation and blending of the acquired knowledge from ITFs with the re-use and reference of prior knowledge eventually can result in innovations and new businesses. As new or improved products and processes must be generated to sustain a good reputation and guarantee sales at upcoming ITFs, the firms disseminated state-of-the-art technological and

fashion knowledge in the cluster. This situation contributes to developing a collaborative environment sustaining its geographical openness and its renewal ability. This also implies that the cluster networks carry on with their local relations and partnerships because they find reciprocated knowledge exchanges to be collectively beneficial.

There are three limitations to consider in this paper. *First*, this paper was set out to address how firms employ geographical and relational proximities to perform knowledge cross-fertilisation. Knowledge cross-fertilisation was conceptualised here as the unintended consequence of dialogue, reflection and observation of others when there is a commitment of firms in clusters to ITFs. This paper operationalised the specific dialogical situations associated with R&D and technology, new/improved products, new/improved processes, training and marketing/exporting. These dialogical situations between the local firms themselves and between local and non-local firms had the objective of addressing the firms' efforts to create new understanding and interpretations. These situations constitute only one kind of manifestation of knowledge cross-fertilisation occurring at ITFs and between clusters and ITFs. Knowledge cross-fertilisation thereby calls out for other research designs that invite other methods to address them. *Second*, it is also clear that future research should test the robustness of this framework across clusters and networks. Yet, this conceptual framework represents a step forward in the ongoing globalisation of clusters. The third and final limitation is that ITFs represent one type of mechanisms helping clusters to find a balance between local and global activities. Thus future research should consider contrasting the importance of ITFs to the role of global oriented buyers, ICT and relocalisation strategies. This paper has nevertheless pointed to the important role that ITFs play in the creation of knowledge originating between varied contexts (ITFs and clusters).

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Paper V

International trade fairs as alternative geographies of knowledge: Knowledge cross-fertilisation beyond permanent clusters – and back

by

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0. Abstract

This paper is concerned with the complex patterns of creation of knowledge within and between international trade fairs (ITFs) and clusters. ITFs are here addressed as temporary clusters as they reflect five core features of *permanent* industrial clusters *but* in a periodic manner. At ITFs firms located at permanent clusters engage in trade, product search, technology updating and networking. The aim of this paper is therefore to introduce the concept of *knowledge cross-fertilisation* to address the consequences of dialogue, reflection and observation among participants (of ITFs as temporary clusters) and non-participants of ITFs (as members of permanent clusters). During the interaction between ITF participants ideas and inspiration emerge and are subject to multiple forms of rearticulation. Such knowledge cross-fertilisation is fostered by individuals, firms and institutions located in permanent clusters but undertaken by individuals participating in multiple ITFs. Hence, knowledge cross-fertilisation occurs as a by-product of the inter-connectivity within and between temporary and permanent clusters. Yet, it appears as a main product of complex social interaction. ITFs, as temporary clusters, thereby constitute *alternative geographies of knowledge of central significance for the local entrepreneurship and innovativeness of permanent clusters.* Temporary clusters are also a support means for the knowledge cross-fertilisation of scarcely connected or isolated firms in permanent clusters.

Key words: knowledge production, cross-fertilisation, clusters, international trade fairs and organising context.

1. Introduction

The ability to create knowledge even at a distance has highlighted the need for understanding the multiple and complex geographies of knowledge (Amin and Cohendet 2004, Faulconbridge 2006). In clusters the ability to innovate and more generally to produce and transfer knowledge between actors is not only the result of the relations and collaboration within local business networks (Waxell and Malmberg 2006). Interaction, relations and collaboration across physical space are also important (Johannisson *et al.* 1994, Giuliani and Bell 2005). To this purpose, previous literature has focused on the role that global knowledge flows (Bathelt *et al.* 2004), growth strategies (Carbonara 2002), digitalisation strategies (Carbonara 2005) and re-localisation strategies (Biggiero 2006) have played in clusters. This paper takes an alternative road. Drawing on multiple bodies of related literature, this paper aims at providing further theoretical insights into how clusters employ international trade fairs (ITFs) to realise knowledge cross-fertilisation across space.

Clusters are addressed here as a permanent phenomenon, as proposed by Maskell *et al.* (2006). In contrast, periodic and recurrent concentrations of individuals, firms and organisations like international trade fairs are addressed here as temporary clusters. ITFs constitute temporary clusters because of their similarities to permanent clusters. Like the latter, ITFs bring individuals, firms and institutions together, although in a concentrated period of time (Allix 1922).[29] At ITFs individuals, firms and institutions operating in the same industry, product line or product category convene in order to trade, search for products and build a reputation for their cluster (Reid *et al.* 2006). At ITFs firms meet regularly with their customers, suppliers and colleagues to exchange information, place orders, solve problems, instigate new acquaintances and maintain existing relations (Blythe 2000, Rice and Almossawi 2002 Hansen 2004). These encounters provide occasions for engaging in the cross-fertilisation of knowledge through their dialogues, cf. Ling-yee 2006.

The benefits of knowledge cross-fertilisation are probably among the key reasons for attending ITFs. Hence, the precise mechanisms for engaging in

[29] The distinction between temporary and permanent clusters has two main considerations (Maskell *et al.* 2006). *First*, the assertion that industrial clusters (Porter 1990a 1998a, b) are a permanent phenomenon means that the features and activities that make up an industrial cluster are present for long periods of time. Citing Marshall (1920), this statement is translated as 'when an industry has thus chosen a locality for itself, it is likely to stay there long.' (p. 271). ITFs, on the contrary, gather individuals, firms and institutions in an event for several days. *Second*, the distinction between permanent and temporary clusters does not imply that they both carry out the same number of operations. Permanent clusters conduct a multiplicity of economic operations on a regular everyday basis. ITFs provide arenas where deals are frequently instigated or negotiated. Such deals are finalized several months after the event (Hansen 2004).

knowledge-generating interaction when firms travel to temporary clusters still need to be conceptualised. This paper aims at elaborating theoretically on the cross-fertilisation of knowledge when relating temporary clusters and permanent clusters reciprocally. In particular, it introduces the idea that firms realise knowledge cross-fertilisation when accessing contacts relevant for potential innovation and new business creation. ITFs provide access to fashion trends, quality and environmental standards, technological novelties and new products, because of the simultaneous concentration of a multiplicity of specialised firms (from hundred to thousands).

The central argument of this paper is that knowledge cross-fertilisation is an unintended or intended consequence of dialogue, reflection and observation of others when there is a commitment to temporary clusters of firms located in permanent clusters. This commitment is triggered by the importance given to the continuous renewal of both firms and clusters; this ability is furthermore central for the survival of firms and clusters. At ITFs inspiration and ideas emerge and are subject to multiple forms of interpretation, rearticulation and recombination. This happens because of the interaction between individuals, new products and novel technologies. Knowledge cross-fertilisation thus occurs as a by-product of the sociality of work originated at ITFs. The social character, the casual contact and diverse events foster a collaborative environment where it is normal to converse with colleagues, partners and even competitors about non-confidential insights, recent challenges and business management practices. As Weller (2007:47) argues, 'this in part reflects the capacities of knowledge to expand, mutate and dilute with use rather than being used as a material inputs'. The framework developed in this paper aims to stimulate a theoretical reappraisal of such knowledge creation. We argue that permanent clusters do not rely solely on the existence of local and global links; they rather depend of the 'organising context' (Johannisson 1988) created by firms located in permanent clusters, when they engage at a multiplicity of temporary clusters.

This paper is organised as follows. Section 2 examines ITFs as a spatial, economic, organisational and social phenomenon in general and as temporary clusters in particular. Section 3 introduces the concept of knowledge cross-fertilisation. Knowledge cross-fertilisation is associated with two processes: knowledge cross-fertilisation instigated at ITFs and knowledge cross-fertilisation continued at permanent clusters. Section 4 subsequently discusses the social character of the cross-fertilisation of knowledge. Section 5 further unravels the complex and uneven cross-fertilisation of knowledge across temporary and permanent clusters. Section 6 presents the organising contexts for enduring the knowledge cross-fertilisation. Section 7 provides the conclusions.

2. ITFs as a spatial, economic, organisational and social phenomenon in economic geography

Since the 'geographical turn' (Martin 1999) in economics a 'cultural turn' (Amin and Thrift 2000) and a 'relational turn' (Boggs and Rantisi 2003) have characterised the field of economic geography. These turns have created an opening for introducing alternative concepts that could advance the theoretical understanding of knowledge cross-fertilisation in the field of economic geography. ITFs are examined here as a territorially anchored phenomenon where local and global actors meet and interact repeatedly to create and circulate knowledge. This suggests the existence of an alternative geography of knowledge relevant for instigating knowledge cross-fertilisation beyond spatial scale-defined limits. To support this proposition section 2.1 presents the geographical nature and origin of ITFs, and the following section 2.2 discusses ITFs as temporary clusters.

2.1 Background

The existence and importance of ITFs have not only been highlighted by the literature on geography (e.g. Allix 1922, Kendall 1936) but also by marketing, communication and international business (Munuera and Ruiz 1999, Wilkinson and Brouthers 2000a).[30] ITFs bring individuals, firms and institutions together and create temporary geographical proximity between them in a place for an intense period of time (Maskell *et al.* 2006). For decades individuals, firms and institutions gathering at ITFs have given structure, meaning and sense to the way in which trade is carried out there. In this sense every ITF embodies a historical, economic, spatial and organisational context in which trade is and has been developed.

ITFs originated in the form of *caravan trade* (i.e. movable fairs) in the days of Babylon in India, and later on in Egypt, Nubia, Arabia and Greece (Allix 1922). The term 'fair' comes from the Latin word *feria* meaning 'holiday' and the Latin *feriae* denoting 'festival'. Caravans would traditionally arrive in towns during religious festivals due to the concentration of people on holidays. The Roman Empire guaranteed security and transportation to trade and, consequently, caravans turned into periodic market fairs. Market fairs embraced the religious character, the commercial activities and the climatic rhythm originally characterising caravan trade (e.g. *tianguis* in Teotihuacan, Mexico ca. 200 B.C.). As trade meetings became institutionalised, the words

[30] Similar events undertaken for specific reasons in the marketing-event industry of professional gatherings include: trade shows, consumer fairs, scientific/technical conferences, congresses, conventions and overseas trade missions (Palumbo *et al.* 1998, Wilkinson and Brouthers 2000b, Weller 2007). These events are not addressed in this paper.

of market fair and religious festival mixed in common language usage. In the Middle Ages caravan trade was substituted by 'commodity fairs' (Allix 1922). The commodity fairs were a means of doing large-scale commerce in all kinds of merchandise. Merchants brought their products to the commodity fairs to make supply and demand meet hands on. The earliest known commodity fair, the fair of Saint Denis near Paris, was established in 629 AD. For five hundred years it was one of the centres of commerce in Europe. Gradually, other commodity fairs appeared in France and Germany. Commodity fairs declined as transportation evolved, and a new form of fairs was introduced: *sample fairs*. The sample fairs (i.e. also called 'Ausfuhrmesse', export fair, Allix 1922) are the direct antecedent of the modern ITFs. They were first introduced at The Crystal Palace in England in 1851 (Seringhaus and Rosson 1994) and then appeared in Leipzig in the 1890s (Allix 1922). The sample fairs were of an international character; they were organised periodically and were habitually held at the centre of a region of production. Buyers were offered prototypes of products, and orders were taken to be executed at contracted times. Products were dispatched from sellers to buyers without physically passing through the fair.

ITFs expanded during the 1980s (Rogers 2003). Of the 2000 major events held worldwide in the 1990s, 60% took place in Europe, 20% in North America, 10% in Asia and the remaining 10% in Latin America (Seringhaus and Rosson 1994). Yet, the continuous growth and variety of ITFs makes it difficult to estimate the total number of events and participants around the world. Nonetheless, participation at ITFs is a common activity of business persons around the world. Table 1 shows participation at ITFs in some European countries in 1993.

Table 1. ITFs in Europe during 1993

Country	Number of events	Number of visitors	Number of exhibitors	Visitors per event	Exhibitors per event
Germany	212	15,161,690	166,825	71,517	787
Italy	87	6,362,038	85,389	73,127	981
Spain	222	53,519,88	59,959	24,108	270
Sweden	64	1,327,732	24,918	20,746	389
United Kingdom	119	1,379,115	21,895	11,589	184

Source: adapted from Munuera and Ruiz (1999: 18)

For firms engaged in international businesses ITFs have become a possibility for accessing information, people and products around the world at a low cost (Florio1994). Firms exhibiting their products at ITFs obtain numerous

advantages including having a qualified audience, being able to reduce cost per new contact, developing relationships, building a reputation, evaluating new products and gathering information about competitors (Rice 1992, Sharland and Balogh 1996, Blythe 1997, 2000). Maskell *et al.* (2006) proposed that ITFs *could be defined as temporary clusters* because of their resemblance to permanent clusters. Maskell *et al.* (2006) provided several explanations of *why* ITFs could be defined as such, stating that temporary clusters *more or less* resemble permanent clusters. Extending this stream of research further, the next section presents a detailed examination of *five core features* supporting such a claim.

2.2 Why ITFs can be conceptually defined as temporary clusters

The concept of [permanent] clusters was originally coined by Porter (1990a, b), drawing from industrial economics theory. After the seminal work of Alfred Marshall (1920) on industrial districts, in particular, numerous studies have been undertaken over the past 30 years. Since then a variety of works have proposed their own alternative definition of the phenomenon, making comparisons almost impossible due to their unique features, i.e. Marshallian industrial districts (Becattini 1988, Markusen 1996), industrial clusters (Porter 1990a, b, 1998a, b), innovative milieux (Camagni 1991), industrial networks (Håkansson 1987) and localised production systems (Belussi and Pilotti 2002, Garofoli 2002), to name a few. The concept of [permanent] clusters was further elaborated on in later studies, making comparisons even more complex (e.g. Porter 1994, 1998a,b, 2000, Humprey and Schmitz 1996, Malmberg *et al.* 1996, Cook and Huggins 2004). Despite these differences, there is general agreement in this vast body of literature that the *five main features* of permanent clusters are

1) that a concentration of socio-economic activities operating in the same, related and non-related industries is at hand,
2) that such activities are vertically and horizontally inter-linked and that these links are changing continuously,
3) that the individuals, firms and institutions in the permanent clusters should be aware of and familiar with the other members,
4) that one or several firms, associations or public agencies play the role of a hub-organisation providing common services and representing firms in dialogue with external stakeholders, such as the government and
5) that the firms, institutions and permanent clusters should show some form of individual and collective entrepreneurship and innovativeness.

ITFs constitute temporary clusters because they *more or less* carry the above-mentioned five features of permanent clusters *but* in a periodic manner. In order to continue where Maskell *et al.* (2006) left off, a detailed examination will now be made of why and how ITFs relate to those five features. This examination shows that the resemblance in the case of ITFs is of a *more* rather than a *less* character when one addresses ITFs as temporary clusters.

The first feature corresponds to the concentration of socio-economic activities operating in the same, related and non-related industries. ITFs *temporarily* gather the most important actors in an industry at *vertical* or *horizontal* events (Seringhaus and Rosson 1994). *Vertical* events draw together the most relevant actors of a particular industry or line of business. To mention some examples: Frankfurt (Germany) is acknowledged for gathering the most famous actors at the international book fair (Boggs 2005). These actors include buyers, suppliers, public agencies and visitors (i.e. journalists and the general public). In 2006 the Frankfurt book fair gathered more than 7,200 exhibitors from over 100 countries and attracted around 280,000 visitors. Cologne (Germany), Guadalajara (Mexico), High Point (US), Milan (Italy), Paris (France) and Rio Grande do Sul (Brazil) have a wide reputation because of their international furniture fairs. Every one of these temporary clusters is annually looked forward to by manufacturers, distributors, retailers, associations and public agencies. Such ITFs set the forthcoming fashion trends for the products that we meet in our furniture stores the following years. In contrast, *horizontal* events have a wide range of products with a broad appeal to the same, related and non-related industries. One such example is the international ICT fair, organised by the Hong Kong Trade Development Council. With more than 25,000 participants the 2007 ICT fair covers various thematic zones including enterprise solutions, network infrastructure, home-grown innovations, Linux and open source, IT outsourcing and multimedia.

The second feature of permanent clusters is that activities are vertically and horizontally inter-linked and that these links keep changing continuously. In temporary clusters firms are inter-linked by means of production, research and development, as well as marketing and finance activities (Florio 1994, Cuadrado-Roura and Rubalcava-Bermejo 1998). As early as 1922 Allix recognised that ITFs were the ideal events for following up partners, creditors, debtors and competitors. The literature on ITFs indicates that one of the most important activities at ITFs is maintaining and developing relations with customers to seek repeated sales (Carman 1968, Bonama 1983, Kerin and Cron 1987, Seringhaus and Rosson 1994), establishing relations and partnerships with new customers (Rice 1992, Sashi and Perretty 1992, Hansen 2004) and meeting key decision makers otherwise inaccessible (Shust 1981, Smith *et al.* 2003). These activities are possible because of the specialisation, periodicity and itinerancy of ITFs.

The third feature of permanent clusters is that individuals, firms and institutions in the permanent clusters should be aware of and familiar with the other members. In temporary clusters there is a clear awareness and identification of their members (i.e. exhibitors). This means that membership at ITFs is defined by the occurrence of any of the following three situations: (1) the participation of a firm in certain ITFs is secured after some years. This means that a firm tends go to specific ITFs. Its partners and potential customers, the media and even competitors also expect and recognise the regular attendance of the firm at certain ITFs (Seringhaus and Rosson 2001). (2) ITFs often sell a type of membership guaranteeing a booth location at the events for a number of years. Certain booth locations are extremely contested because of their visibility and position with respect to others at ITFs. This is the particular case of the fairs organised by the furniture producers' association, AFAMJAL, in Guadalajara, Jalisco (Mexico). The best available booth locations at the Expo Mueble are exclusively sold to the members of AFAMJAL. Lastly, (3) membership – or exhibiting a firm's products at an ITF – depends on the location of a company in a specific country. This is the particular case of 'I Saloni WorldWide New York'. This event is an Italian furniture fair organised in New York since 2005. I Saloni WorldWide New York features innovative furnishings produced *only* by Italy's most important manufacturers. The fair is an annual platform for reaching markets and prestige in the US.

The fourth feature of the permanent clusters is that one or several firms, associations or public agencies play the role of a hub-organisation providing common services and representing firms vis-à-vis the government. At ITFs there is an association, a public agency or a firm orchestrating the events (Florio 1994). AFAMJAL and Sindmóveis, the furniture union of Bento Gonçalves, Rio Grande do Sul, Brazil, are internationally known as the hub organisations preparing and co-ordinating the furniture fairs. Alternatively, the foreign affairs agency can also play the role of a hub organisation, cf. Seringhaus and Rosson 1998. In Chile, in order to promote national industries, it is the foreign affairs agency that co-ordinates the participation of firms at particular ITFs (Wilkinson and Brouthers 2000b).

The fifth feature refers to the individual and collective entrepreneurship and innovativeness of permanent clusters. This feature is also present at temporary clusters. The competition between ITFs has forced hub-organisations to carry out the most attractive and competitive events. This means that certain ITFs have gained their reputation because of the modern facilities, participant quality, innovative exhibited products and novel services. Such ITFs are commonly characterised by an enterprise information portal and often by electronic commerce activities for encouraging individual and joint business activities. Let us consider The High Point Market of furniture in North Carolina, US. This fair enables firms to conduct business

via electronic commerce through the enterprise information portal, an action which permits purchasers and manufacturers to close deals during the event.

To sum up, temporary clusters like ITFs display an extraordinary openness to fashion trends and technical information. The physical co-presence of individuals, firms, institutions and products allows communication to take place across multiple sensory channels simultaneously with instantaneous feedbacks and adjustments. Product exhibitions, face-to-face meetings, seminars, casual encounters and gatherings enhance the social interaction (Tesar 1988, Rice 1992). *Such interactions foster interpretations and an understanding of what is being seen and reflected because of the highly intensified concentration of individuals, novel products, and new technologies.* The frequency, intensity and contents of such interaction vary depending on the firm's experience, size, needs, problems and strategy, cf. Seringhaus and Rosson 2001. Nevertheless, the input from ITFs, such as new insights into fashion trends, business management practices and recent technical information, pushes forward the activities performed within firms and their local networks that are active at permanent clusters, cf. Weller 2007. Before we elaborate further on this, let us first review the traditional view of knowledge cross-fertilisation in permanent clusters.

3. The conventional view of knowledge cross-fertilisation

The conventional view of knowledge cross-fertilisation in permanent clusters is that the generation of knowledge is an activity of the individual firm as much as a product of the relations and collaborations between firms beyond permanent clusters. This idea is based on the assumption that firms have been sourcing external knowledge outside their firms and their permanent clusters with the purpose of creating or improving products, processes and organisational forms (Waxell and Malmberg 2006). In permanent clusters the relations and collaborations occurring between individuals, firms and institutions for cross-fertilisation are manifested in two ways: (1) as unintentional and spontaneous knowledge leaks and (2) as intentional and systematic knowledge flows.

The unintentional and spontaneous knowledge leaks, constituting *the first road to cross-fertilisation*, occur between firms because of their relations and/or collaborations in the same and related industries. These leaks are acknowledged in the literature as knowledge spillovers (Audretsch and Feldman, 1996, Hörte 2004). Such leaks are freely circulating 'in the air' as a public good (Marshall 1920, Arrow, 1962). Knowledge as a public good implies that firms cannot protect the knowledge with patents or conceal it for the use of others, and thus others can benefit from it in their own innovation

activities (Baptista, 2000; Karlsson *et al.*, 2004). Employee recruitment, spin-off initiatives, and friendship relations are the usual channels stimulating such activities (e.g. Almeida and Kogut 1999, Capello and Faggian 2005). In relation to employee recruitment Almeida and Kogut (1999) studied the employee mobility across the US of engineers holding patents. The mobility of engineers between firms was relevant for knowledge cross-fertilisation in Silicon Valley. One interpretation of their results was that the mobility of engineers within a region and to other regions was possible through a partially visible network.

Johannisson *et al.* (1994) conducted a pioneering study on cluster networks. In their study of Gnosjö, a Swedish cluster, these authors signal that networks of multi-stranded relationships were important channels for sharing experience, connecting new people and realising businesses with local and non-local firms. The geographical proximity of friendship relations facilitated the sharing of a community sense resulting in unintended knowledge cross-fertilisation. Such friendship relations make it easy to pick up relevant topics of conversation at planned or unplanned encounters and to further establish regular collaboration. According to Keeble *et al.* (1999), the rules of behaviour embedded in the social relations guarantee the standards of behaviour which engender trust and collaborations, stimulating in turn further cross-fertilisation.

In relation to the relevance of knowledge leaks for innovation Baptista (2000), using UK data, showed that the location of previous adopters of technology fosters the probability of other local firms adopting such technology. One of the interpretations of his results was that knowledge leaks associated with technical knowledge were geographically localised. In a similar vein Capello and Faggian (2005) demonstrated that employee recruitment and collaboration with suppliers and customers were important channels for disseminating innovation-related knowledge between firms in the Veneto region. While the significance of the labour market was studied by means of the percentage of new employees belonging to a local area, the contribution of the collaboration with local suppliers and customers was weighted by every manager. Even if their study only matched innovation with the percentage of turnover spent in R&D activities, it confirmed the relevance of such 'collective channels' for knowledge cross-fertilisation between local firms.

Intentional and systemic flows, constituting *the second road to cross-fertilisation*, occur between firms because of their relations and partnerships in the same and related industries. In clusters the geographical proximity permits firms to monitor others for benchmarking purposes. Firms monitoring local competitors with similar capabilities take up the experiments of rivals at hardly any cost (Malmberg and Maskell 1999, 2002).

These activities often begin as an imitation process but involve the development and the conceptualisation of the acquired knowledge in accordance with local conditions. Massa and Testa (2004) found that small and medium-size firms in the maintenance industry in Italy regularly studied external practices and performances. They compared such practices with internal ones and found knowledge gaps. These firms subsequently changed their routines and invested in the necessary resources generating innovation in products and processes.

In relation to the intentional and systemic collaboration conducive to the production of mainly technical knowledge Giuliani and Bell (2005) researched the dissemination of external knowledge by means of intentional co-operative behaviour in a local knowledge network (LKN). These authors asked the firms to identify the most significant incoming technical knowledge flows. The firms agreed that external partners were important sources of support when technical help was required. Giuliani and Bell (2005) demonstrate that external technical knowledge was commonly spread in an uneven and highly selective manner through partners of an LKN in a Chilean Wine cluster; c.f. also Giuliani (2007). According to Giuliani (2007), firms with a strong knowledge basis possessed the incentive to transfer knowledge and were in a condition to reciprocate such transmission.

Because of the relevance of knowledge cross-fertilisation beyond the permanent clusters, there has been a growing recognition of the dispersed or distantiated sociology of learning in the literature (Amin and Cohendet 2004). This literature has further suggested that the sociality of work provides a common frame for instigating knowledge cross-fertilisation even at a distance, cf. Faulconbridge 2006. Or more theoretically put: *knowledge* cross-fertilisation occurs as a main product of complex social interaction when firms and institutions are members of a permanent cluster and participate in temporary clusters. In what follows we propose the concept of knowledge cross-fertilisation in response to such claims.

4. Knowledge cross-fertilisation and the sociality of work

We thus introduce the concept of ‘knowledge cross-fertilisation’ to mean the unintended or intended consequence of dialogue, reflection and observation of others when there is a commitment to temporary clusters on the part of firms in permanent clusters. Knowledge cross-fertilisation occurs as a by-product of the inter-connectivity within and between temporary and permanent clusters but as a main product of complex social interaction, that is, as a product of the sociality of work (as when a firm travels to an ITF).

Increasingly, temporary clusters like ITFs have become a fashionable activity as it enables the participants to combine work and fun. At ITFs individuals, firms and institutions perform their jobs while enjoying the conviviality of the exhibition, dinners and tourist activities with partners and even with competitors. This conviviality stimulates the unintended or intended knowledge cross-fertilisation initiated at ITFs. Such cross-fertilisation often emerges as an exchange of knowledge and is followed by making sense of such knowledge, resulting in multiple forms of interpretation, rearticulation and recombination.

Knowledge cross-fertilisation occurs because of the participation of individuals, firms and institutions in a multiplicity of temporary clusters over a period of time. However, travelling to multiple ITFs does not account for the occurrence of knowledge cross-fertilisation; travelling is merely a precondition. Instead, the process of knowledge cross-fertilisation first takes place at ITFs and then continues at permanent clusters; this process is constitutive for knowledge cross-fertilisation to take place. Let us elaborate upon this somewhat more.

When individuals, firms and institutions participate at ITFs, the nature of communication between them depends on chance, intention and improvisation. It is also stimulated because of the global standards for fashion trends, quality and business management practices. This proposition states that fashion knowledge (i.e. knowledge concerning consumer preferences) might emerge from one region whereas technical knowledge on production might be located at numerous sites all over the globe (Weller 2006). This approach includes other symbolic and expressive forms of knowledge manifested in design, marketing and visual arts (Pinch *et al.* 2003) recently associated with the concept of fashion knowledge (Weller 2006). Altogether, these parameters create a basis for what is perceived as 'natural dialogical situations'. This is, however, a highly specialised conversation environment, where reflections about the latest news on fashion trends, business management practices, products and individuals take place. As it feels normal to engage in dialogical situations, participants create a safe environment for realising intense social interactions. Such interactions provide occasions where knowledge is reconstituted or merely transferred to permanent clusters. Although the social interaction is part of a 'marketing strategy' (Hansen 2004), firms use it as a tool for the cross-fertilisation of knowledge as a regular routine at ITFs.

Within their interactions firms share interpretative schemas, build and exploit synergies and construct mutual understandings of their knowledge on specific issues. Individual firms subsequently resituate their knowledge in the evolving context of conversation and observation according to their prior related knowledge. Obviously, the less relational proximity (Ramírez-Pasillas

2007) between dialogue partners, the smaller the possibility that knowledge will be reached and shared at ITFs. Returning to their permanent home clusters, firms participating at ITFs absorb, translate and circulate such knowledge via their relations and partnerships. They circulate this knowledge because they need to produce new and improved products/processes in order to sustain their local entrepreneurship and innovativeness, cf. Johannisson 2003, Giuliani and Bell 2005. Thus, this triggers a process of knowledge cross-fertilisation at the permanent cluster, where external knowledge is blended and combined with prior related knowledge. This process is ultimately beneficial for ensuring the continuous renewal of firms and clusters.

To sum up: knowledge cross-fertilisation instigated at ITFs and continued in the permanent clusters are the crucial components for knowledge cross-fertilisation to take place. Therefore, this process deserves further elaboration in the next section.

5. Knowledge cross-fertilisation revisited

Knowledge thought as a property of firms, institutions and permanent clusters is nothing new (e.g. Belussi and Gottardi 2000, Maskell 2001). In these conditions knowledge is seen as hard to 'get out' or translate because of the tacit, embodied and delicate nature of knowledge (Brown and Duguid 2001).[31] Yet, knowledge cross-fertilisation occurs in the form of varied practices like when people work tightly together in communities of practice (Brown and Duguid 1998, Gertler 2001). Communities of practice are groups of individuals informally linked together by mutual engagement, shared context, common tasks and shared problems (Brown and Duguid 1998, Wenger 1998). In this view, knowledge cross-fertilisation activities are inevitably social in nature. In other words, the core problem with knowledge thought of as a property is that it is separated from social interactions and the extraordinarily intense practice of participating at ITFs. Knowledge cross-fertilisation results in the generation of *new knowledge* triggered by the social interaction and by shared business practices (following Wenger 1998, Amin and Cohendet 2004). Social interaction refers to the social character of what individuals do when they work or have fun. It includes performing a job alone or with others and the conviviality of the job itself. Participation at ITFs as a practice embraces the ways in which individuals, firms and institutions engage mutually in trading, developing relationships, making a reputation and establishing partnerships, cf. Tanner 2002, Hansen 2004.

[31] Tacit knowledge refers to the knowledge that one owns but cannot speak of (i.e. skills). In contrast, explicit knowledge refers to the knowledge that is transmitted in the form of formal systematic language (e.g. engineering drawings, manual codes, patents, etc.). This knowledge can be of help for developing tacit knowledge but cannot produce the skills automatically.

In other words, participation at ITFs creates its own knowledge, *its own set of practices that functions in a set of conditions where people work together in a particular environment*.[32] The participation and social interaction manifested at ITFs creates a collaborative environment nurturing swift trust among individuals out of their personal and professional identification, chemistry and complementarities between firms and/or institutions.[33] Such an environment entails the social cross-fertilisation of new knowledge, because it gathers specialists with similar training, sharing similar challenges and with a mutual engagement in trading.

Furthermore, the absorptive capacity of individuals, firms and institutions engaged at ITFs also plays an important role; the absorptive capacity means that firms and institutions have an ability to spot, assimilate and exploit external knowledge (Cohen and Levinthal 1990, Giuliani 2005). The absorptive capacity of firms and institutions and the environment of ITFs allow for the creation of knowledge. This cross-fertilisation of knowledge is addressed by Nonaka and Takeuchi (1995) as the conversion of tacit knowledge into explicit knowledge, or 'externalisation'. When individuals, firms and institutions engage at ITFs, they spot novelties in products, technologies and trends present at their global industries. Thereby, individuals, firms and institutions located in different places build linkages between them (Maskell *et al.* 2006). Through their social interaction actors share non-confidential insights, problems faced and practices. Some of those insights and practices are transferred across physical space, cf. Faulconbridge 2006. Knowledge cross-fertilisation is initiated through the insight gained from observation, conversations and joint sense-making with relevant actors,

[32] Practice in this paper means 'doings in a historical and social context that gives structure and meaning to what we do. In this sense, a practice is always social practice' (Wenger 1998:47). Similarly, Brown and Duguid (2001:200) use the notion of practice to refer to the way in which work is done and…knowledge is created." The practice of ITFs meets both definitions. Such practice is a common and regular activity among business persons because of their engagement and participation at ITFs. At ITFs individuals, firms and institutions are exposed to a multiplicity of actors, products and technologies that broaden their understanding and awareness of their global industries and their practices. Furthermore, we do not use the concept of 'practice' in a best practice sense. Gertler (2001) argued that the idea of 'best practices' has diffused in the vocabulary of business schools, corporate rhetoric and management consulting. Consulting firms have benchmarked industries in search for 'the' best practices perceiving this situation as an opportunity, cf. McKinsey, Boston Consulting Group, KPMG, PricewaterhouseCoopers. Best practices reflect the idea that 'there is one universal standard against which all firms should measure its operational efficiency' (Gertler 2001:6). Practices here do not necessarily encompass a best practice recognized by firms around the world; it entails a set of procedures or a way of going about for firms or organizations that are unique, representing localized knowledge. There are practices internal and practices external to firms and institutions. Some examples of internal practices are the way in which firms are managed, collections are put up together, information systems are applied and problems solved. Some examples of external practices are the way in which relationships and collaborations are established or worked out in localized networks.

[33] 'Swift trust' means that individuals in firms and institutions are able to rely on each other rapidly if they show behaviour that is co-operative, equal and ethical (Meyerson *et al.* 1996).

cf. Ling-yee 2006. Thus, when externalisation occurs between two or more individuals, firms and/or institutions, it is constituted by two situations (Bessy and Brousseau 1998):

(1) The receiving individual uses knowledge in ways that are not apparent to the original holder. This is a common *unintended* situation that has to do with the cross-fertilisation of new knowledge; the receiving individual interprets the knowledge according to her interests, understanding and experience.[34] This exercise results in novel uses of the received knowledge. It can inspire the receiving individual to work in a slightly different direction that is not perceived by the original holder of the knowledge. Such cross-fertilisation of knowledge can create a moral conflict as it can be hidden in nature; it benefits the receiver party without consent from the giver party.

(2) Within social interaction the parties are actually initiating an *intended* knowledge cross-fertilisation process expanding the initial knowledge of the receiving individual and the original possessor of the knowledge. The nature of the tacit knowledge changes since the process of codification changes both the tacit and the explicit knowledge. In other words, shared knowledge is subject to revisions, re-articulation and improvements.

The new understandings and interpretations generated during the externalisation of knowledge are derived from relational proximity, commitment and consensus as well as from participation at diverse ITFs, cf. Ling-yee 2006. Once back at their home permanent cluster, firms and institutions start with the production, adaptation, and blending of the new ideas acquired and the re-use and re-articulating of prior related knowledge (Carbonara 2004). This internal process is not straightforward; it can occur in many different ways, cf. Huber 1991. Firms' routines, in-house skills, experience, creativity, resources and a combination of technology ensure the creation of knowledge (Bathelt *et al.* 2004, Davenport 2005). Next, the translation, circulation and further cross-fertilisation of knowledge take place from one firm to another or between firms and institutions. This leads us to the discussion of the mechanism allowing the creation of knowledge at ITFs and at permanent clusters.

[34] This means that knowledge is contextualized according to individuals' interpretations of the relevance in each situation (e.g. Lave and Wenger 1991, Blacker 2002).

6. The organising context ensuring knowledge cross-fertilisation

The ability of utilising dispersed knowledge from temporary clusters to permanent clusters is a complex and time-consuming process. Knowledge-in-motion across physical space cannot be separated from its complexity and tacitness (Brown and Duguid 1998). This makes it almost impossible to explain by using only conventional theories associated with permanent clusters. Instead, the notion of the organising context (Johannisson 1988) is of the utmost relevance in the process of knowledge cross-fertilisation across space. The proposition here is that firms construct an organising context as an enacted collaborative environment in which firms co-create their own development conditions (Johannisson 1988, 1994). This co-creation of development conditions means that firms enhance their social and business activities influencing one another in order to promote local entrepreneurship. Local entrepreneurship is about the continuous (re)creation of both businesses and permanent clusters; thus, firms instigate their interactions, relations and collaborations in their organising context according to the issues being dealt with in their own firms and permanent clusters (Johannisson 2000). The organising context can be defined territorially (e.g. limited to a permanent cluster, and/or a temporary cluster), functionally (e.g. corporation, global value chains), virtually (e.g. networked global structures) or demarcated by a combination of them (Johannisson 2000, Johannisson *et al*. 2002a, Ramírez-Pasillas 2007).

The organising context manifested in networks which are being socially, historically and culturally embedded (e.g. Johannisson *et al.* 2002a).The network functions like a 'loosely couple system' (Orton and Weick 1990). This means that in this network the nodes – firms and institutions – are interdependent, albeit autonomous. This autonomy implies that individual firms and institutions own or control resources and their boundaries by commanding the opportunities for entering or exiting (Brunsson and Sahlin-Andersson 2000) the network. This thus becomes a form of collective interdependent agency constructing a socio-economic practice. This socio-economic practice is in turn shaped by the interactions, relations and collaborations between varieties of local and non-local actors.

The organising context includes certain features of the concept of 'constellation of interconnected practices' (Wegner 1998: 127). A 'constellation of interconnected practices refers to a broader configuration than a single community of practice' (Wegner 1998: 127). Incorporating features of the communities of practice, Wegner (1998) uses the concept to describe the constellations of practices found in a single organisation gathering individuals sharing practice. However, he does not support the idea

that the notion can be used for addressing the interaction, relations and collaboration between individuals, firms and institutions. Thus, the organising context instead gathers local and non-local individuals, firms and institutions in networks, these actors sharing styles, related activities, similar conditions, challenges faced, mutual engagement and a joint enterprise *as in a constellation of practice*. However, the organising context incorporates individuals, firms and institutions from around the world with slightly similar representations, beliefs, language systems and views on the same description, job task and problem-solving approach (e.g. Amin and Cohendet 2004). At ITFs an organising context provides a collaborative environment for producing and circulating understanding and a way of expressing this understanding beyond its confines. Their routinised and periodic interactions in this context provide individuals, firms and institutions with a direct influence from each other's experiences and understanding gained at ITFs on the permanent cluster (or vice versa). An organising context thus seems to be a more useful concept to describe the cross-fertilisation of knowledge instigated at ITFs and furthered among the members of this context at permanent clusters.

The social interaction and the practice shared by the members of an organising context provide individuals, firms and institutions with the ideal environment to realise knowledge cross-fertilisation. This environment permits the conventional channels for knowledge cross-fertilisation to be used (i.e. knowledge leaks and knowledge flows). Table 2 knowledge leaks and knowledge flows are reviewed as they appear in the organising context in next page.

At permanent clusters knowledge leaks occur because of the relations and collaborations between individuals, firms and institutions. At ITFs encounters between buyers, suppliers and even competitors commonly occur spontaneously at dinners, seminars and in corridors (Maskell *et al.* 2006). In such encounters knowledge leaks are at hand. Individuals, firms and institutions observe and comment upon the latest products, hottest technologies, local market knowledge, industry codes and conventions of the host country (Rice 1992, Seringhaus and Rosson 1998, Hansen 2004). Such knowledge leaks occur because of the 'legitimate peripheral participation' (Lave and Wenger 1991:34). The legitimate peripheral participation indicates that learning occurs because it is an integral part of the world we live in (Lave and Wenger 1991). It further means here that when individuals, firms and institutions are present at ITFs, they are introduced to the learning of such events by means of their social interaction. The observation, dialogues and reflections occurring between members of the organising context allow them to gradually learn from their practice (i.e. practice of participating at ITFs, or practice of collaborating in networks). ITFs provide firms and institutions with access to the particular uses of the language and the ways of

understanding knowledge in their industries. More experienced firms can, for instance, introduce younger firms to the practice of participating at ITFs by simple 'being there' (Gertler 1995). The former firms can meet with other 'more experienced' firms and learn about the particularities of foreign markets. The legitimate peripheral participation opens up for boundary spanning and can thereby trigger entrepreneurial processes. Firms can, for instance, introduce younger colleges to non-local partners. Firms can also meet with other 'more experienced' firms and create ways for trading abroad.

Table 2. Complementary means for knowledge creation

Means	Temporary clusters	Permanent clusters
Knowledge leaks	- Face-to-face meetings - Mobility of employees across places - Spin-offs	- Friendship and community ties triggering face-to-face meetings - Local mobility of employees within or across places - Spin-offs

Knowledge flows	- Observation of others' products at firms' booths
	- Searching and maintaining relations and partnerships by means of :
	  - seminars, lectures, and presentation of products
	  - hands-on experience on products and technologies
	  - purchasing products and technologies
		- Observation of others at the office, plant or exhibition rooms
		- Searching and maintaining relations and partnerships by means of:
		  - technical support
		  - hands-on doing (learning by doing, learning by trial and error and experimentation)
		  - purchasing products and technologies

Another knowledge leak in a permanent cluster is employee mobility (Almeida and Kogut 1999). The circulation of employees from one firm to another in permanent clusters (or between regions) encourages knowledge

cross-fertilisation, cf. Almeida and Kogut 1999. ITFs also provide opportunities for encouraging employee mobility across places. ITFs are events that are ideal for keeping participants updated on new job possibilities and even conduct job interviews. Job seekers can use ITFs to screen suitable firms in the industry, and job providers can conduct interviews with candidates from distant places for sourcing knowledge that has been generated in different companies and places.

Knowledge flows take place in permanent clusters between firms and institutions because of their intentional and systematic relations and partnerships in the same and related industries (see p.10). Thereby one of the central elements of participating at ITFs is the production of a new product collection and having a striking booth for attracting as many potential customers as possible. For these reasons light users of fairs locate themselves close to the leaders and/or competitors in order to be informed about their latest innovations. Firms also aim at attracting visitors passing by the booths of industry leaders and/or competitors. Buyers and visitors make almost immediate comparisons (Seringhaus and Rosson 2001). At ITFs competing firms keep track of each other (Florio 1994). Firms gather information about their competitors, industry trends, and firms' strategies (Shust 1981). The collected information helps firms to make strategic decisions about policies and programmes in marketing, finance and production (Hansen 2004). These issues are also related to the legitimate peripheral participation notion. Learning is an integral part of the participation at multiple ITFs (Ling-yee 2006); even if it is not meant, it occurs spontaneously because of the sociality of work at hand, cf. above.

Knowledge flows occur at permanent clusters by means of relations and partnerships (Waxell and Malmberg 2007). At ITFs knowledge circulates between the members of the organising context. This membership is reached by their ongoing joint activity in networks and their repeated encounters at ITFs. According to Tesar (1988), many European booths have their own conference rooms and lounges at ITFs. At their rooms and lounges contacts and partners are provided with seminars, lectures and meetings. Håkansson (1982) emphasises the significance of the social interaction at ITFs when social, cultural and geographical distances exist between actors (Rice, 1992). Seminars and lectures arranged by firms at ITFs create an arena for information exchange and product presentation, which encourages increased interaction (Ling-yee 2006). In the rooms and lounges there are meetings central for knowledge cross-fertilisation, where people engage in the channels carrying knowledge flows. Individuals, firms and institutions regularly discuss product designs, product functions, product improvements and often product failures (Bello 1992). Firms also participate in the 'hands-on experience' of new products (Kerin and Cron 1987, Seringhaus and Rosson 1994). 'Hands-on experience' trials permit individuals to get close to

new products, try new software and run machines. These simple exercises result in opportunities for engaging in dialogical situations. Accordingly, direct experiences with non-local products, markets and technologies are becoming a necessity to supplement secondary information already collected (Spence and Crick 2001).

The idea here is that knowledge leaks and flows generated at ITFs are circulated and advanced at permanent clusters thanks to the organising context. This proposition entails that understandings and interpretations generated at ITFs can be exported from ITFs and reinterpreted and improved in the process of being adapted, adopted and transformed with reference to prior related knowledge. As the actors do not require permanent geographical proximity at ITFs, this opens a channel for the further cross-fertilisation of knowledge in accordance with local conditions at permanent clusters.[35] Once the latest news of ITFs arrive and are absorbed into individual firms or institutions, collaborative partners engage in, for instance, 'hands-on doing' to exchange, assimilate and produce knowledge in order to create or improve products/process; cf. learning by doing (Arrow 1962, Levitt and March 1988). The further cross-fertilisation of knowledge according to local conditions can then be relatively easy when sharing similar practices as compared to the difficulty of moving knowledge among heterogeneous groups within a firm. Indeed 'it is often harder to stop ideas spreading than to spread them' (Brown and Duguid, 1998:102). Thus, let us reconsider next the interconnectivity within and between temporary and permanent clusters.

The concept of knowledge cross-fertilisation offers a bridge to link multiple geographies of knowledge; it highlights the inter-connectivity of temporary and permanent clusters. Knowledge cross-fertilisation is feasible when permanent clusters are seen as embedded in an organising context formed by actors sharing practices. The organising context serves as the main link through which knowledge cross-fertilisation takes place within permanent clusters but also beyond its confines through networks. The networks provide the safe and ideal collaborative environment where individuals, firms and institutions meet to further their knowledge. This is done by means of shared collective processes of sense-making, negotiating and engaging in trading-related tasks. All of these acts are accomplished through participation at multiple ITFs. In other words, ITFs draw together local and non-local firms and institutions working in organising contexts and being specialised in the same industry, product line or product category. ITFs offer such firms and

[35] Knowledge is also renewed from external sources that are not necessarily connected to ITFs. Other channels of knowledge dissemination include media (i.e. print, video, electronic), trade through organized market transactions, mergers and acquisitions, foreign direct investments, trade shows, consumer fairs, fashion shows, scientific/technical conferences, conventions and overseas trade missions (e.g. Gertler 2001, Weller 200/, Faulconbridge 2006, De Propis and Driffield 2006).

institutions an arena for sustaining relationships of mutual engagement organised around what they are there to do (i.e. trade). Trading (or a potential trading situation) is, however, just the means to originate the knowledge cross-fertilisation process.

The diversity of individuals, firms and institutions sharing a membership in the organising context back at the permanent cluster and at ITFs generates a higher quality in the knowledge cross-fertilisation processes. This diversity reduces the risk of 'group think' (Grabher 1993) and fosters openness between participants of ITFs. During the social interaction between individuals, firms and institutions the dialogical situations, shared reflection and observation consolidate learning. This learning is enhanced by discussions of shared practices, problems and challenges faced. As this in done voluntarily, their participation implies a higher motivation to learn and sets off a deeper internalisation of the learning. However, this does not suggest that everything takes place in a friendly manner at the organising context. Challenges, tensions and disagreements can be forms of participation as well (Wenger 1998). Furthermore, although intensive at ITFs, the social interaction between the individuals, firms and institutions dilutes afterwards; it becomes increasingly supported by information communication technologies (i.e. e-mail, groupware, video conferencing). Distant interaction is additionally activated if needed.[36]

Nevertheless, as trends, insights and practices are picked up at ITFs, this sets *the pace* for distributors, retailers, media publications and production schedules around the globe, cf. Weller 2007. Yet, this pace varies for different kinds of ITFs as they follow various climatic seasons or historical festivities. It is, however, common that certain individuals, firms and institutions located at permanent clusters participate in several ITFs annually. Three different studies provide examples of the variation in pace. Ramírez-Pasillas (2007) found that firms in the Lammhult cluster in Southern Sweden create their organising contexts by actively making use of ITFs. Firms on average engaged at three ITFs annually. At ITFs firms met with their foreign partners to discuss issues relevant for innovation. In their networks the firms were directly or indirectly connected to other firms that did not participate at ITFs; they thereby enhance local entrepreneurship.

Alternatively, Weller (2007) depicted that the Spring Summer 2002 bi-annual fashion shows repeatedly display the same or similar designs in New York, London, Milan and Paris. Because fashion shows arrived at diverse parts of the world at different times, knowledge flowed rhythmically and

[36] The literature agrees in that relationships and/or partnerships begin at ITFs but continue after the event (Rice 1992, Hansen 2004). This is the reason for the importance of ICT and repeated participation being established and relations and collaborations developed. Firms meet successively in the next ITFs to adjust deals and relations.

systematically, differentiating products by their geography. Every place combined the latest trends with their rooted local practices; as a result, fashion was translated into technical knowledge at the local level. This suggests that members of the organising context created and circulated knowledge adopting, adapting and transforming it according to their local conditions. In a similar vein Faulconbridge (2006) highlighted the co-existence of multiple geographies of knowledge in a study of advertising professional service firms in London and New York. Professional advertisers working in the same group of firms built a functional organising context; they commonly chose international congresses to meet and exchange experiences, news and non-confidential insights.

To sum up, knowledge cross-fertilisation is a product of the interaction, relations and collaborations between individuals, firms and institutions in networks embedded in temporary and permanent clusters. This inter-connectivity channels knowledge cross-fertilisation by means of networks of varying scope and reach.

7. Conclusions

Knowledge cross-fertilisation is here proposed as a conceptual tool for enhancing understandings and interpretations originated beyond permanent clusters but reverting to them. Two processes constitute knowledge cross-fertilisation: knowledge cross-fertilisation originated at ITFs and knowledge cross-fertilisation continued at permanent clusters (or vice versa). Knowledge cross-fertilisation occurs because of the existence of an organising context sharing practices, enterprise and engagement encountered at temporary clusters. Such an organising context is a collectively enacted environment gathering individuals, firms and institutions from around the world with slightly similar representations, beliefs, language systems and views on the same description, job task and problem-solving approach. The organising context provides the ideal environment for producing and circulating understanding and a way of expressing this understanding beyond temporary clusters via networks. The networks present at permanent clusters generate the further reconstruction of knowledge according to local conditions.

Knowledge cross-fertilisation is thus initiated as unintended or intentional transformations at temporary clusters and is distinctly influenced by the social, institutional and geographically frameworks of the permanent clusters. ITFs present the dominant fashion trends and shared practices, creating the dominating conceptual and perceptual alternative references around the world. Yet, much could be said about such dominance over styles, discourses and frames of reference. Nevertheless, ITFs ease the processes of selection from conceptual and perceptual alternatives in order to push technical advancement at permanent clusters. At permanent clusters the

reconstruction of knowledge draws on the reworking of and reference to prior related knowledge from multiple ITFs, resulting in imitations, incremental innovations and sometimes even radical innovations (Weller 2007).

Knowledge cross-fertilisation between inter-connected temporary and permanent clusters helps overcoming the limits that firms and institutions create for themselves because of their geographical proximity at permanent clusters. Encountering at ITFs firms and institutions invigorate their local entrepreneurship. Through their organising contexts individuals, firms and institutions create anti-lock-in effects that promote geographical openness, joint opportunities and impede high personal cohesion at permanent clusters, which otherwise may lead to decline, cf. Soda and Usai 1999, Alberti 2006. Geographical closure and high personal cohesion trap knowledge into ensembles that are seldom shareable, changeable and that are hard to translate. This seriously impairs the mobility of knowledge, and the continuous renewal of firms and permanent clusters, if they are allowed to rule the agenda.

Knowledge cross-fertilisation is not an automatic process. Breschi and Lissoni (2001) suggest that it takes at least six months to obtain new products and processes from external knowledge. Salomon (2006) found that Spanish manufacturers materialised knowledge from their foreign partners into new products or processes in twelve to twenty months. This probably means that during that time knowledge was being assimilated at the individual firm level before being translated, circulated and passed on to other partners in permanent clusters. Knowledge cross-fertilisation within and between temporary and permanent clusters entails a great deal of work. Thus, choosing what to invest time, money and effort in and determining what to go on with are important decisions for management to take (Brown and Duguid 2001).

The organising context can also be employed by scarcely connected or isolated firms to escape from dominant actors in permanent clusters. It can further be used when the permanent cluster no longer has anything to offer such firms. By participating at ITFs scarcely connected or isolated firms can expand their vision, strengthen their awareness and alertness and build an understanding and position in the global industries in which they work.

The concept of knowledge cross-fertilisation does not advocate the idea that all knowledge contained in different temporary and permanent clusters can be reused, adopted and improved. This concept creates instead an opening for suggesting that a very modest degree of knowledge is circulated, rearticulated and reconstituted from a temporary cluster to a permanent cluster (or vice versa). This indicates that such external knowledge needs to

be modelled in a way that takes the experience of the specific context at hand into consideration. It also suggests that knowledge cross-fertilisation ensures the continuous renewal of firms and permanent clusters.

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