

# Global pipelines or global buzz? A micro-level approach towards the knowledge-based view of clusters

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## Abstract

*Recent theorizing in cluster literature emphasizes the importance of inter-cluster knowledge linkages in addition to local knowledge dynamics, enabling new and innovative ideas to flow from one cluster to the other. This paper contributes to this topic by studying inter-cluster knowledge linkages at an individual level of analysis, making use of qualitative social network measures. Central to this case is the Amsterdam New Media-cluster, with a special focus on entrepreneurs engaging in lively inter-cluster exchange of knowledge and debate, resulting in the exchange of new visions and ideas across cluster boundaries. The proposed distinction between local buzz and global pipelines is complemented by adding a third category of inter-local knowledge exchange: global buzz.*

**Key words:** pipelines, global/ local buzz, entrepreneurship, cluster



## INTRODUCTION

In the past fifteen years or so, clusters rich in entrepreneurial activity like Silicon Valley (USA), the Emilia-Romagna region (Italy), and the Amsterdam New Media-cluster, have increasingly been approached from a knowledge-based perspective (Bahlmann & Huysman, 2008; Tallman & Phene, 2007; Rocha, 2004; Feldman & Francis, 2004; McEvily & Zaheer, 1999; Kumar *et al.*, 1998), invoking both scholars and policy makers to perceive clusters as repositories of knowledge (Florida, 1995). In this perspective, geographical agglomerations are considered ideal ‘platforms’ for the transmission of tacit forms of knowledge and learning among firms and entrepreneurs (Bathelt, Malmberg & Maskell, 2004; Thornton & Flynn, 2003), enabling cluster inhabitants in the creation and identification of new and promising opportunities.

However, the notion that entrepreneurs are predominantly dependent on their local knowledge network for their creative input (that is, new and innovative opportunities) is highly arbitrary. In fact, creative knowing, and the exchange thereof, can be considered (in potential) the least spatially bound when contrasted to other forms of knowing like craft/ task-based knowledge exchange (Amin & Roberts, 2008). Indeed, many recent contributions have questioned the dependence of tacit knowledge transfer on geographical proximity (e.g. Amin & Roberts, 2008; Saxenian, 2006; Boschma, 2005; Bathelt *et al.*, 2004; Gertler, 2003), arguing that successful clusters distinguish themselves through building and maintaining “a variety of channels for low-cost exchange of knowledge with relevant hotspots around the globe” (Bathelt *et al.*, 2004: 33). The importance of these inter-cluster knowledge linkages, also referred to as ‘global pipelines’ (ibid., 2004), is for instance briefly reported in Grabher’s (2002) study of Soho (London, UK) and Scott’s (2002) analysis of the motion picture and entertainment cluster in Hollywood (USA). What was once considered a local phenomenon primarily, that is, exploiting local contacts for opportunity identification by entrepreneurs, now seems to be accompanied by an inter-cluster (or inter-local) counterpart.

Notwithstanding the significant progress of our understanding of the importance of inter-cluster knowledge dynamics for overall cluster innovativeness, our knowledge of how such interactions take place is still limited. Basically two perspectives have been proposed. In the first perspective inter-cluster linkages take the form of so-called global pipelines (Bathelt *et al.*, 2004): ties among entrepreneurs or firms located in different clusters, characterized by a high degree of structure and formalization. Such strong inter-firm or inter-personal ties are deemed

necessary for the successful transmission of knowledge across cluster boundaries (Owen-Smith & Powell, 2004; Gertler & Levitte, 2003). The knowledge exchanged through such pipelines is considered to be non-incremental and distinctly different from the knowledge available within the boundaries of the cluster, also referred to as 'local buzz'. In contrast with the first, the second perspective argues that inter-cluster knowledge interactions take place in the realm of informal, social networks. Entrepreneurs establish informal social ties with actors in other localities, allowing them to tap into the 'local buzz' of another cluster (Saxenian, 2006).

Both the knowledge exchanged (local buzz as opposed to non-incremental knowledge) and the nature of the ties involved (strong or weak) differs in these perspectives. To resolve these apparently contradicting perspectives a deeper understanding is necessary of the micro-processes taking place among entrepreneurs engaged in inter-cluster interactions. Therefore we ask how inter-cluster ties are established and maintained, what knowledge is being exchanged (non-incremental versus local buzz), and what type of ties are involved (weak or strong).

This paper will provide empirical accounts generated through qualitative social network measures. Central to this case is the Amsterdam New Media-cluster, with a special focus on entrepreneurs engaging in lively inter-cluster exchange of knowledge and debate, resulting in the exchange of new visions, ideas, and opportunities across cluster boundaries. The empirical findings with respect to the qualities of the ties involved and the content flows they facilitate, require us to critically reflect on the knowledge based perspective of clusters (Bahlmann & Huysman, 2008).

This paper's contributions are twofold. First our focus on local entrepreneurs engaging in inter-cluster knowledge exchange provides new evidence for our understanding of inter-cluster as well as intra-cluster knowledge processes. Second we extend theorizing and debate on the role of social networks within and between clusters in the discovery of opportunities.

The first section of this paper introduces the theoretical debate. This section will culminate in a set of research questions that lie at the heart of the present paper. Section two describes the methods applied in this study. Section three provides an account of the Amsterdam New Media-cluster and the inter-cluster knowledge linkages that originate from this cluster. This cluster, which contains a number of sub-sectors that all revolve around (digital interactive) new media, serves as the context in which the issue addressed above is discussed. Finally, section four and five involve the conclusion and discussion.

## **THEORY**

### **The “regional” dimension of knowledge**

The regional dimension of innovation, entrepreneurship, and knowledge is a much debated issue in the realm of spatial agglomeration literature (Marshall, 1920; Thornton & Flynn, 2003; Malecki, 1997; Sorenson, 2003; Morgan, 1997; McEvily & Zaheer, 1999; Brown & Duguid, 2000; to name but a few). An interesting contribution can be found in the work of Grabher (2002), and in particular in his study of project ecologies in the advertising industry localized in Soho, London (UK). As Grabher asserts, “particularly in the creative realm in which the artistic ethos prevails, personal networks seem strongly, though *not exclusively*, rooted in a particular locality” (2002: 257, emphasis added). Indeed, “projects in the advertising industry increasingly are embedded in the context of international networks and global communication groups (...)” (*ibid.*: 258).

In studying transnational entrepreneurship in relation to Silicon Valley, Saxenian (2006) notices what she has termed the *new argonauts*: “U.S. educated immigrant engineers” (*ibid.*: 4) who successfully establish themselves as entrepreneurs in their home countries, thus contributing significantly to realizing new economic and innovative dynamics, resulting in prosperous regions around the world. Interestingly, these immigrant entrepreneurs benefit greatly from their contacts in the U.S. (most notably Silicon Valley), enabling them to “quickly identify new market opportunities (...)” (*ibid.*: 5).

Although the importance of local knowledge linkages is not contested, their contribution to the creation and discovery of new and innovative opportunities by entrepreneurs should be considered comparison to their inter-local, counterparts. The reason for this is twofold: first, convincing empirical evidence on the relationship between co-location and localized learning is still lacking; second, it is suggested that entrepreneurial pipelines have contributed significantly to the development of former peripheral economies into vibrant knowledge economies such as to be found in Taiwan, China, India, and Israel (Saxenian, 2006), and consequently to the successful business performance and innovativeness of individual entrepreneurs. If supported more widely it is this latter notion that can seriously alter our understanding of innovation in relation to agglomeration processes. How the balance between these two types of interactions

take place, though, as well as the nature of the knowledge that is being exchanged has not been studied jointly. Therefore the validity of the claims for both remains unclear.

### **The geography of knowledge exchange**

The phenomenon of clusters, here defined as a geographically concentrated group of firms and entrepreneurs linked through both vertical and horizontal relationships (Porter, 1990), has been linked to knowledge dynamics from its very first appearance in mainstream economic literature (Marshall, 1920), and ultimately has evolved into a knowledge-based perspective of clusters (Bahlmann & Huysman, 2008). In discussing this perspective, we limit ourselves to the “social and cultural dimensions of co-location” (Amin & Cohendet, 2004: 88). This stream of literature mainly focuses on micro processes taking place within industrial districts, cities, or regions (*ibid.*). An important line of argument within this stream of literature focuses on the role of tacit and explicit knowledge with respect to the emergence and growth of clusters. Given the specific interest of this paper the micro-perspective on co-location serves as a useful and logical starting point for discussing related issues.’

Basically, tacit knowledge is considered to be a key determinant of “the *geography* of innovative activity” (Gertler, 2003: 79, emphasis in original). From this perspective, tacit knowledge is considered to defy easy codification and, thus, is hard to share across long distances. More importantly, tacit knowledge is assumed to be spatially sticky due to its context specific nature, implying that actors can only share tacit knowledge effectively when sharing a similar social context. This social context is, to a large extent, assumed to be defined locally. Finally, the process of innovation is increasingly based on tacit interactions between actors, meaning that the process is characterized by interactive, social learning (Gertler, 2003). As such, local knowledge networks in the form of clusters are considered crucial to economic revitalization and intensified innovation.

The process by which knowledge is exchanged and created locally has also been conceptualized under the heading of ‘local buzz’: the sharing of information and knowledge through face-to-face contacts, co-presence and co-location by individuals and firms. Clusters are usually based on a combination of activity in the same or related industry in a particular locality or region. The idea of local buzz relates to the perception of clusters as vibrant milieus in which lots of developments are going on simultaneously. As Bathelt *et al.* (2004: 38) describe it, local

buzz consists of “specific information and continuous updates of this information, intended and unanticipated learning processes in organised and accidental meetings, the application of the same interpretative schemes and mutual understanding of new knowledge and technologies, as well as shared cultural traditions and habits within a particular technology field, which stimulate the establishment of conventions and other institutional arrangements.” By just ‘being there’ (Gertler, 1995), actors are considered to continuously contribute and profit from the dispersion of information, gossip and news relevant to their profession and the market they are acting in.

Recent theorizing on knowledge dynamics and cluster competitiveness (Bathelt *et al.*, 2004), however, stresses the possible benefits that can be realized from having access to both local *and* global sources of knowledge. The main argument with respect to the value of global pipelines to the development of an economic cluster involves the entrance of new knowledge developed elsewhere (i.e. systematic linkages to another knowledge hotspot). Firstly, entrepreneurs with ties to actors located in other clusters benefit directly from the knowledge obtained through these pipelines. Secondly, the knowledge that enters the cluster via these pipelines is likely to “spill over” to other actors located in the cluster through the entrepreneur’s local knowledge network (Bathelt *et al.*, 2004). As Saxenian notes, “as lawyers, venture capitalists, investment bankers, entrepreneurs, managers, and other professionals travel between regions, they transfer technical and institutional knowledge as well as contacts, capital, and information about business opportunities and markets” (2006: 95). The flow of information across distant regions is facilitated by the social fabric spanning these regions.

Stressing formal inter-firm relationships, Owen-Smith & Powell (2004) contend that firms build pipelines to benefit from knowledge hotspots around the world. Their study of biotechnology firms in Boston (USA) shows that firms gain important, non-incremental knowledge through pipelines rather than through their local network (i.e. local buzz). In this specific study it becomes evident that firms do not build their knowledge based on regional and local interactions solely, but also draw on strategic partnerships that span regional and national borders.

In a similar vein, Bresnahan, Gambardella & Saxenian (2001) point out the importance of extra-cluster linkages for the rise of successful clusters. Scott (1998) argues that the performance of a cluster is dependent on both localized and non-localized interactions. Uzzi (1997) warns for local networks to evolve into inward-looking knowledge systems not capable of developing new

knowledge (over-embeddedness), while Burt (1992; 2007) stresses the importance of actors that are capable of bridging networks otherwise disconnected for the entrance of new, non-redundant knowledge.

A recent theoretical contribution by Maskell, Bathelt & Malmberg (2005; 2004) provides a somewhat different angle to the phenomenon of inter-cluster knowledge flows. Basically, Maskell *et al.* (*ibid.*) propose international events such as conferences, trade fairs, congresses, and the like, as vehicles for inter-cluster interaction among entrepreneurs and firms to take place, thus providing in a temporal context for intensified knowledge exchange and social interaction. This perspective is different, for it highlights the relevance (and necessity) of temporal contextual space to facilitate the social interaction required for the exchange of visions, opinions, and ideas across clusters.

Breaking down the pipeline-thesis, the following assumptions are pivotal to its rationale: (1) knowledge is developed locally, that is, in local knowledge networks connecting local entrepreneurs, institutions, and firms, resulting in highly context-specific (tacit) knowledge that is difficult, *yet not impossible*, to convey across cluster boundaries (Grabher, 2002). Clusters, thus, are perceived as unique and context-specific knowledge systems; (2) the creation or entrance of new knowledge and opportunities should be best perceived as a combination of close and distant interactions, that is, a combination of interactions within (local buzz) and across (global pipelines) cluster boundaries (Oinas, 1999); (3) non-redundant and non-incremental knowledge and opportunities travel across cluster boundaries through systematic social connections of a strategic kind among entrepreneurs located in different clusters, and spills over to other cluster ‘members’ through knowledge spillover effects and local buzz (Bathelt *et al.*, 2004). Local buzz, thus, is assumed to be distinctly different from knowledge generated through pipelines.

The pipeline-thesis represents an interesting turn in the cluster literature. Basically, it can be argued that the pipeline-thesis introduces a different perspective of clusters for it allows us to move away from perceiving the cluster as a ‘bounded region’, and instead adopt a social network perspective to interpret and understand innovative dynamics at a regional level. Or, as Thrift & Olds put it, “the network serves as an analytical compromise, in the best sense of the word, between the fixities of the bounded region metaphor and the fluidities of the flows metaphor” (1996: 333). But the content that flows through global pipelines remains relatively unexplored,



as are other characteristics of such social connections across cluster boundaries. For instance, it is unclear to what extent global knowledge exchange indeed takes place in a systematic and strategic manner. The clear-cut distinction between local buzz and global pipelines implies that 'buzz' is strictly a local phenomenon (hence *local* buzz). This assumption appears ungrounded and is in need of further scrutiny, as it is very much conceivable that 'buzz' isn't limited to socially constructed cluster boundaries.

Therefore, in order to fully understand the value of global pipelines to entrepreneurs in terms of providing knowledge in general, and new and innovative opportunities specifically, focus should be shifted to the actual content 'flowing' through them as well as the characteristics of the ties involved. A micro-level social network approach is needed in order to meet this theoretical issue.

## **METHODS**

The data presented in this paper were collected in thirty-two interviews in total, divided among two phases of research and incorporating both qualitative and quantitative elements.

The first phase of interviews took place during 2007, and incorporates twenty-four interviews with entrepreneurs (15), policy makers (3), and industry professionals (6) active and located in the Amsterdam New Media-cluster. These interviews, with an average duration of ninety minutes, were conducted with the aim of generating a broad understanding of the Amsterdam based IT and new media sector. The respondents were selected based on expert interviews and extensive desk research. During the first phase interviews were purely qualitative of nature, and consisted of a range of open ended questions related to three main topics: (1) respondent's perception of and experience with the so-called Amsterdam New Media-cluster in terms of present disciplines and industries, (2) respondent's experience with respect to knowledge dynamics taking place in the Amsterdam New Media-cluster, and (3) respondent's social network and its significance to respondent's daily (professional) life. These interviews provided insight in certain local dynamics taking place in the Amsterdam New Media-cluster (see results section), but also proved valuable in detecting the inter-local dimension of the cluster as well.

The second phase of interviews (eight in total) took place in the beginning of 2008 and specifically was aimed at gaining an in-depth understanding of inter-local knowledge dynamics taking place across the Amsterdam New Media-cluster boundaries. For this second phase of

interviews, entrepreneurs with both local and inter-local social contacts were approached. Interviews conducted during this empirical phase averaged a duration of seventy minutes, and involved a qualitative social network analysis (see table 1). This resulted in richly described ego-networks of the focal entrepreneurs.

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Insert Table 1 about here  
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Typically, a phase-two interview would start with a number of introductory questions. These questions comprised topics such as respondent's expertise and experience, but were also aimed at determining the extent to which the entrepreneur was involved in innovative undertakings as well as the extent to which the entrepreneur was locally and/or globally active in terms of business. The introductory phase would then be followed by the set of social network questions as presented in table 1. After having generated relevant contacts and having established the nature of the relationship between respondent and each mentioned contact (resulting in a set of ego-networks), the interview would continue with a set of open ended questions. These open ended questions were aimed at gathering in-depth insight in the nature of ideas and inspiration that had reached the respondent through his contacts. In addition, this part of the interview was aimed at understanding how and why these relationships were established and maintained, as well as establishing the nature of the ties involved in terms of tie strength.

The name generator and interpreter questions are based on previous research (Rodan & Galunic, 2004; Batjargal, 2007; Burt, 1997), but slightly adapted in order to fit the research scope. In addition, the SNA-questions were translated to Dutch; in the process of translating SNA-questions from English to Dutch, multiple colleagues were involved in order to ensure that the Dutch translation corresponds to the original.

## **RESULTS**

### **A general account of the Amsterdam New Media-cluster**

Before actually reporting on the results, it is useful to provide a description of the Amsterdam-based New Media-cluster, incorporating its general characteristics in terms of present industries and disciplines as well as local networking dynamics. This section is followed by a rich account

of inter-cluster knowledge linkages of entrepreneurs based in the Amsterdam New Media-cluster.

The Amsterdam-based New Media-cluster is considered to give presence to a number of related industries, all in which the creative ethos prevails, to speak with Grabher (2002). Four main activities are regarded as characteristic to the Amsterdam New Media-cluster in particular, namely (1) multimedia enabling activities, (2) content distribution activities, (3) content provision activities, and (4) e-marketing (Den Hertog *et al.*, 2000).<sup>1</sup>

The first category involves businesses that are concerned with activities such as the development and production of IT hardware, e-commerce applications, consumer electronics, interface design, web hosting, consulting on e-commerce and internet strategies, et cetera (*ibid.*: 3). The second grouping of activities taking place in the Amsterdam New Media-cluster involves businesses that relate to providing access to the Internet and the distribution of multimedia devices and software (*ibid.*: 3). The third category involves firms creating new formats and concepts, electronic publishing, developing new service concepts, et cetera. The final category involves activities related to ‘e-marketing’: webvertising, media acquisition, marketing communication, et cetera (*ibid.*: 4, 8).

The Amsterdam New Media-cluster was identified by Leisink (2000) and the OECD (2002) as the region in the Netherlands with an exceptionally high concentration of IT and new media related activity.<sup>2</sup> Fifteen percent of all jobs in the Dutch creative industries are located in the Amsterdam region. This implies that the creative industries are overly represented in Amsterdam, for the relative share of Amsterdam-based jobs in the Dutch economy is 6,4 percent (Rutten *et al.*, 2004). In addition, seventy percent of all optical fiber cables in the Netherlands are concentrated in the city of Amsterdam alone.

Typically, new media goods and services (e.g. websites, interactive television-programs, e-marketing campaigns, et cetera) are produced in an *ad hoc* fashion. Their production depends on the collaboration of actors coming from different industrial sectors and different professional

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<sup>1</sup> Although Den Hertog *et al.*'s conceptualization of the Amsterdam New Media-cluster (which they term multimedia-cluster) dates back to the year 2000, its broad characteristics make it very much applicable to today's reality still.

<sup>2</sup> Officially, that is from a policy perspective, the Amsterdam New Media-cluster is perceived to comprise the greater Amsterdam region as well as the region of Hilversum. For matters of convenience, we will suffice with the term Amsterdam New Media-cluster.

communities with different, though sometimes overlapping, cognitive and epistemological backgrounds.

For entrepreneurs active in the Amsterdam New Media-cluster, networking is vital in order to stay competitive. Especially as entrepreneurs find themselves in an environment that is being characterized by constant change, dynamic interaction among different disciplines, and lots of different stakeholders running different agendas. In this cacophony of developments and change (both in terms of technology and markets), entrepreneurs experience the need to make sense of their environment, to identify possible opportunities, and to generate inspiration and ideas. Without any doubt, location plays a significant part in the process of gathering ideas and inspiration, for it increases the chance of meeting. To quote one entrepreneur on this topic:

“I regularly meet people from Hyves or eBuddy or that kind of companies at [a local bar], without knowing in advance what we’re going to talk about, but in the end we all have great ideas. Or I run into them by chance and we chitchat a bit and before you know it you get all kinds of interesting ideas you otherwise wouldn’t have had” (Interview E1\_Y.B., first phase, translated from Dutch).

These sorts of occasional chance meetings are clearly facilitated by geographical proximity but, in addition, also by the existence of so-called networking events: relatively small, heavily localized, and industry specific events that provide the IT and new media entrepreneur and professional with the possibility to physically meet with peers from the same, similar, or related disciplines. The network associations are organized similar to their Silicon Valley equivalents in the sense that they are regionally oriented, represent a (limited number of) professional (and related) discipline(s), and require participant membership (Saxenian, 2006). Although the network associations clearly position themselves as occasions for exchanging knowledge and ideas, they also provide an opportunity for peers to meet socially.

However, the creation of new ideas and opportunities does not appear to be a strictly local occasion. To quote an entrepreneur on this issue:

[When attending lectures at conferences] “I usually do not learn about new developments, but that’s also because we have a global network through which we learn

about numerous things that are going on globally, but that do not seem to be on the agenda in the Netherlands. (...) Take for instance a conference in San Francisco I went to last month, at a certain moment you take part in a round table-meeting with 50, 60 peers, of which 30 to 40 provide a lecture at that particular conference. And it's a selective group of specialists in which you learn of one another at peer level, where you exchange opinions, provide each other with suggestions, and where you identify and share current developments. And this all continues on the Internet following the conference. (...) You have a network of people through which one learns of the developments that matter very quickly, and that allows you very quickly to find yourself in a context in which sensemaking takes place." (Interview E1\_F.v.O., first phase, translated from Dutch).

The exchange of knowledge, it appears, takes place in an international (or rather inter-local) context as well, liberating the entrepreneur in question from the constraining elements of the locality he is rooted in (i.e. the Amsterdam New Media-cluster). As such, it appears that the distinction between local buzz and global pipelines (Bathelt *et al.*, 2004) is somewhat simplistic. The 'buzz' is not simply and exclusively a local phenomenon, but instead appears to have a global counterpart: global buzz.

### **Inter-cluster knowledge exchange from an ego-perspective**

The following section represents an in-depth exploration of inter-cluster knowledge exchange by entrepreneurs interviewed during the second phase of inquiry. As explained in the method-section, the ego-networks presented in figure 1 were generated through qualitative social network analysis, meaning that the social network data was generated by means of interviews, enabling us to go in-depth as to the nature of the relationship and the knowledge content exchanged.

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Insert Figure 1 about here  
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The ego-networks presented in figure 1 provide a first micro-level insight into knowledge exchange among entrepreneurs, both within and across cluster boundaries. Based on the ego-networks, current beliefs on the apparent pervasiveness of tacit knowledge flows to manifest

strictly local in the form of clusters seem to be in need of some serious reconsideration. To exemplify this notion, it is interesting to elaborate on ego-network #1.

This specific case tells the story of an entrepreneur (henceforth ego) located and firmly embedded in the city of Amsterdam. At present, he owns a consultancy company (together with his business partner [GK]) that focuses on advising companies on their corporate website. So doing, ego makes use of a concept called ‘service design’: specialized consumer research during the early phases of new design projects, when designers and engineers determine what matters to the people they are developing new products and services for. Ego developed this approach as a PhD at the Royal College of Art (London, UK), and it involves a radical new way of approaching the design process of, for instance, corporate websites.

The main developments with respect to the service design-concept take place in the Anglo-Saxon world, and hence it is not surprising that his inter-cluster knowledge contacts all are located in the UK (London). To quote ego on this issue:

“The outlook in London is much more internationally oriented. They (his inter-local contacts [MDB]) have a better understanding of what goes on globally speaking. A topic such as ‘service design’ is much further developed over there. And that offers interesting opportunities for the Dutch market, you know. One of the things we are occupied with is positioning ourselves in the Dutch market as *the* party specialized in service design.”

And specifically about his inter-local contacts:

“(These people) provide me with ideas, and they allow me to test my ideas and thoughts with them. You know, ideas with respect to how to design specific research, what customers to focus on, on what sector, how to define your service and approach, et cetera.” (Interview E2\_B.R., second phase, translated from Dutch).

Many of these contacts were established during ego’s PhD-research in London, but are for a large part maintained at conferences and trade fairs. Interestingly, ego’s local knowledge contacts (excluding his business partner [GK]) play an important role as well. To ego, these local contacts are important for they have specific knowledge about the Dutch market. To quote ego:

“They are quite valuable in that I can test ideas generated through my London-based contacts. You know, to what extent these ideas already are applied in the Dutch market. They are more knowledgeable about the Dutch market than I am. They can tell me about

what is happening over here, and what's not, you know, to what extent these ideas are worth pursuing. And at the same time they act as a portal to potential customers.” (Interview E2\_R.B., second phase, translated from Dutch).

In this specific case we nicely see the interplay between ego's local and non-local knowledge contacts. However, it also shows that the entrepreneur in question does not act in accordance with much research on localized knowledge exchange. In fact, all of the entrepreneurs interviewed during the second phase of inquiry heavily draw on their inter-local contacts when it comes down to generating new ideas and inspiration, as we shall see in the section below. Drawing on the interviews underlying the ego-networks presented in figure 1, it is safe to say that events such as congresses, conferences, trade fairs, et cetera, play a significant role in establishing and maintaining both inter-cluster knowledge linkages among entrepreneurs and a global buzz on IT and new media. This section starts with describing the relevance of these so-called *temporal knowledge hotspots* in order to provide context to the inter-cluster knowledge transfer phenomenon.

### ***Temporal knowledge hotspots***

Contacts established at international conferences are an important and primary source of inspiration. International conferences on IT and new media offer entrepreneurs the possibility to meet peers who act at the forefront of international developments taking place in the realm of the Internet, IT, and new media. International conferences that matter in this field are conferences like Web2.0 expo (USA, San Francisco), LeWeb (France, Paris), DLD (Germany, Munich), Future of Web Apps (UK, London), The Next Web, and the Cross Media Week (both in The Netherlands, Amsterdam).

International conferences facilitate inter-cluster knowledge exchange in the sense that they bring together visions and ideas related to current and future developments with respect to the Internet, IT, and new media. In addition, these conferences allow participants to discuss and value these visions and ideas; these interpretations form the base by which new ideas and opportunities are inspired. As one entrepreneur recalls from visiting such international conferences:

“You know, as I see it there are two kinds of creativity. There is market creativity with respect to the Netherlands, I have to do something in the Dutch market you know, versus long-term *undercurrents* (meaning long-term developments of a fundamental nature [MDB]), and those long-term *undercurrents* stem from *bigger* markets and people with *broader* visions, who are involved in those fundamental developments and who spent a lot of time and effort in attending these conferences to invest in things globally, which of course is very inspiring. (...) To me this is important as it helps me to decide in what to invest.” (Interview E2\_G.v.N., second phase, translated from Dutch).

These long-term undercurrents very much relate to the concept of local buzz, in the sense that it involves the “application of the same interpretative schemes and mutual understanding of new knowledge and technologies, as well as shared cultural traditions and habits within a particular technology field, which stimulate the establishment of conventions and other institutional arrangements” (Bathelt *et al.*, 2004: 38). Similarly, other entrepreneurs located in the Amsterdam New Media-cluster stress the fact that, in their case, it is important to have contacts in Silicon Valley:

“In my profession, everything that happens in the US is relevant, also because they are still ahead of us (...). So I have to keep a close eye on them and therefore it’s very useful to have contacts over there to discuss new developments with, what developments are important over there and could become important over here. (...) It helps me to keep ahead of my customers for sure.” (Interview E2\_E.B., second phase, translated from Dutch).

“[My contacts in Silicon Valley] are more important to me in terms of industry-specific knowledge, because they are located at the hart of my market. In the US, the adoption of semantic web-technology is further developed than it is in Europe, *as is often the case in IT*. So professionally speaking these contacts inspire me.” (Interview E2\_R.P., second phase, translated from Dutch).

A significant part of the inter-cluster knowledge exchange involves making sense of and keeping up with *current* developments, as well as making sense of visionary ideas and *future* developments. To provide an example, one such visionary and ideological debate that is currently taking place (at conferences but also among peers on the Internet) revolves around the semantic web, and specifically about its future.

The semantic web can be understood as a set of technologies designed to enable a particular vision for the future of the Internet. This future is envisioned as the Internet containing and comprehending all knowledge available on the web, meaning that the semantic web enables



software applications to reason and understand (Spivack, 2006). At current, this debate is also conveyed under the heading of ‘web 3.0’.

Without judging the feasibility of this specific vision, it is fair to say that debates such as the one sketched above are characterized by a high degree of ideology. In this specific case, the ideological undertone reflects a world vision in which the Internet will or should evolve into a medium much more able to serve humanity, enabling society to progress from an *information* society to an actual *knowledge* society. It also reflects a great belief in technology in general, and in the Internet specifically, as the means to achieve a knowledge society.

Debates as the one described above have vast implications for many related yet distinct Internet and new media-related disciplines. It is important, however, to realize that such debates aren’t limited spatially, that is, in the geographical sense of the phrase. Rather, the development of visions and ideal representations of the Internet and related technologies takes place on a global level, with advocates of particular standpoints spreading the message through appearing and speaking at conferences both in Europe and the USA. These debates provide strong stimuli for the creation of a shared understanding of the role of the Internet and related technologies in present-day and future society.

In addition to facilitating a debate with respect to the future of the industry and the Internet, international events provide the attending entrepreneurs with an opportunity to learn about competitors and foreign markets, as well as about possible opportunities in their home markets.

“(...) you do have plenty of local firms who copy concepts created in the USA with the goal to implement them in Europe. (...) Of course you get involved in *brain picking* (original wording by respondent, not translated from Dutch [MDB]), you try to get inspiration from different things and you look at what your competitors are involved in, but we never copied a service concept such that it was indistinguishable from its original.” (Interview E2\_A.S., second phase, translated from Dutch)

To adopt the wording of Maskell *et al.* (2005), entrepreneurs participating in these events are in the position to take notice of the current market frontier. Apparently, entrepreneurs encounter interesting and inspiring new product and service concepts at such events, enticing them to reflect on their current market position and current business proposition. In addition, such encounters and conversations provide the entrepreneur with valuable knowledge about unfamiliar markets:

“I just went to a congress in Eastern Europe for four days, you know, Zagreb, Belgrade, et cetera, and for four days you’re surrounded by people from the Internet industry. (...) Because you are talking with these people, I learned so many new things, also about the Eastern European market, and how they value certain global developments and you debate social media and stuff.” (Interview E2\_P.d.L., second phase, translated from Dutch)

Important to note in this respect is the fact that the entrepreneurs interviewed are regular participants of conferences and congresses, thus getting a chance to built relationships with other regular participants as well. Data suggests that we are dealing with an exceptional class of entrepreneurs and business people. To quote one entrepreneur on this issue:

“These people (i.e. his inter-local contacts [MDB]) are coincidentally located in Silicon Valley or Israel, but they are very ambulant. And it’s good that they are based over there (i.e. Silicon Valley or Israel [MDB]) but it actually is more important that they are ambulant. Of course these guys do have their network in Silicon Valley or Israel or wherever.” (Interview E2\_G.v.N., second phase, translated from Dutch)

This class of people, being very ambulant yet firmly embedded in a particular locality, are able to transcend the cultural and institutional context distinctive to their home base, and are committed to a shared vision of the future, or rather, a belief system. This collective commitment to a joint endeavor does not necessarily result in a community (with its specific knowledge dynamics), but does seem to motivate people to engage in a global debate using community specific language, discussing different scenarios for the future, as well as taking a stand in terms of which vision or world view to pursue. To provide an example:

“Mark and Dick (two of respondent’s inter-cluster contacts [MDB]) are inspiring personalities who you meet once in a while. They are leading figures in my discipline. Dick, for instance, has enormous experience with OpenID and the way in which he handles his business and is trying to change the Internet in such a way that people can do more with it, yes to me that is very inspiring, you know, to do things yourself. And Mark, well he sort of does it in the same manner but he is a very outspoken, big guy who is present on every event in the business.” (Interview E2\_A.S., second phase, translated from Dutch)

This inter-local debate seems to be one of the basic elements from which a shared world vision is generated. The events mentioned above are important facilitators of this debate, for they ease the process of inter-local debate and sensemaking. Bringing together representatives from different clusters (be it Silicon Valley, Munich, Amsterdam, et cetera), or rather from different cultural and institutional contexts, seems to yield new combinations of visions and perspectives, and provide the spark for inspiration and new ideas. As such, the exchange of visions, perspectives, and ideas might be conceptualized as *global buzz*: an information and communication ecology that transcends geographical boundaries but that appears to be rooted in many distinct yet related clusters.

### ***Inter-cluster knowledge linkages and tie strength***

International events and conferences serve as temporal knowledge hotspots. However, the ties that are established at such occasions are not limited by the temporal nature of the event in question. The consecutive nature of such events allows the development of mutual trust, shared language, and other aspects of relationships to advance (Maskell *et al.*, 2005).

“When communicating with these guys (i.e. contacts from other clusters [MDB]) we can suffice with half a word. They also are at the front-end of the market, you know, they have an international perspective as well. And we regularly meet abroad at these events without any of us knowing in advance that the others are participating as well.” (Interview E2\_J.K.K, second phase, translated from Dutch)

Contacts that originate at these temporal knowledge hotspots are maintained partly because of the consecutive nature of such events (many of these entrepreneurs tend to visit multiple events a year). This notion gives good reason for a brief analysis of the characteristics of the social ties involved in the exchange of knowledge, especially since the characteristics of the tie involved (i.e. strong or weak) is considered to matter in terms of exchanging knowledge. Clusters, for instance, are considered truly dynamic when “characterized both by dense local social interaction and knowledge circulation, as well as strong inter-regional and international connections to outside knowledge sources and partners” (Gertler & Levitte, 2003: 1).

In the transfer of knowledge among inter-cluster knowledge linkages (the lines between ego and square nodes in figure 1), both strong and weak ties are involved. Apparently, inter-cluster

knowledge linkages are a multidimensional phenomenon, involving different kinds of knowledge (see earlier section) as well as different types of social ties.

Inter-cluster knowledge linkages mainly serve the purpose of keeping up with the developments in their respective field as well as providing new inspiration and ideas related to these new developments, regardless of tie strength. Both strong and weak inter-cluster knowledge contacts provide the entrepreneurs in question with the necessary amount of creative input, sensemaking, and business opportunities. Table 2 provides a more detailed account of the number of different types of ties involved in the ego-networks. Remarkably, the table shows clearly the non-exclusive character of the associations between inter-cluster relations and tie strength, which has so strongly been argued in other studies.

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Insert Table 2 about here  
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The fact that similar knowledge flows through both strong and weak inter-cluster knowledge linkages requires us to reassess the relevancy of the nature of the social ties involved in this process. Tie strength does not seem to be a decisive factor in this process. The willingness of contacts to engage in knowledge sharing with both strong and weak contacts, as well as the ability to transfer highly context-specific and abstract knowledge, might be related to the earlier mentioned shared worldview that characterizes the sensemaking process taking place. This shared worldview might be considered a decisive factor in enabling as well as motivating entrepreneurs to engage in inter-cluster knowledge exchange, as it facilitates a common understanding as well as a common (ideological) purpose. However, although a plausible explanation, this remains speculation.

## **CONCLUSION**

In this paper, the concept of inter-cluster knowledge linkages is brought to the forefront with the aim of deepening our understanding of the actual flow of content it facilitates, as well as the characteristics these linkages exhibit in terms of tie strength. So doing, this paper intends to move beyond our present conceptual understanding of intra- and inter-cluster knowledge flows and to enrich our empirical comprehension of the phenomenon in question.

The quotes presented in the result section can be considered a testimony of Amsterdam-based IT and new media entrepreneurs engaging in rich inter-cluster interaction with their international counterparts. In fact, the social interaction taking place among this class of entrepreneurs involves a considerable amount of making sense of past, current, and future developments. “Where practice is common, communication can be global”, so it seems (Brown & Duguid, 2001: 205).

However, the data also show that there is a local – or should we say spatial – twist to this global communication mantra. International events such as trade fairs, conferences, et cetera, serve as temporal knowledge hotspots that facilitate the social interaction required for the transmission of tacit knowledge. This temporal locality provides the entrepreneurs in question with the ability to engage in rich and valuable knowledge exchange. The social interaction required for this process (e.g. face-to-face contact) seems to induce entrepreneurs to participate in such temporal knowledge hotspots, thus accepting the high costs that inherently are involved in participating in such events.

More specifically, the knowledge transfer process involves the exchange of visions and opinions with regard to the major developments taking place in the industry and the Internet. Intriguingly, this discussion is taking place at an ideological level, involving questions like what role technology and the Internet should fulfill in people’s life, and how technology and the Internet can change the world (for the better). This discussion seems to be strongly embedded in a shared worldview, namely that society as a whole can benefit from technological progression (i.e. progression in the realm of the Internet, IT, and new media). Such conversations and discussions prove to be a big source of inspiration to the entrepreneurs interviewed for this paper. Indeed, this process of knowledge exchange across cluster boundaries seems to be the spark for new – entrepreneurial – ideas and opportunities. At the same time, this process influences entrepreneurs – whether or not consciously – in their attitude towards new developments and the role they and their firm should fulfill in this movement.<sup>3</sup> Debates such as the one revolving around the semantic web create strong loyalties among participants and lead to a shared problem and world vision (Amin & Roberts, 2008).

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<sup>3</sup> The open-source communities can be considered another striking example of this notion, for they seem strongly influenced by as well as allied in their quest for open-source software.

Besides the ideological debate taking place at such temporal knowledge hotspots, events like DLD and Web 2.0 expo provide the participating entrepreneurs with the opportunity to engage in “brain picking”, i.e. to learn about competitors’ products and services as well as developments at other markets. It induces entrepreneurs to introduce such new products and service concepts in their (domestic) markets, and basically involves a process of imitation and adaptation.

The data also show that inter-cluster knowledge linkages are built from strong and weak ties (Granovetter, 1973; 1983) among entrepreneurs. The knowledge involved – although being highly abstract and context-dependent – travels through both weak and strong ties. Tie strength, like geographical proximity, does not seem to play a decisive part in this process. This finding contradicts the idea that strong ties are uniquely capable of and thus preferable, for the transmission of knowledge to take place between clusters (Gertler & Levitte, 2003). At the same time, weak ties are considered more likely to be involved in the transfer of new and innovative knowledge. To quote Granovetter, “whatever is to be diffused can reach a larger number of people, and travels greater social distance (...), when passed through weak ties rather than strong” (1973: 1366). The fundamental assumption prior to this notion is that the actors to whom one is weakly connected, will probably move in different social circles compared to one’s own, and thus will have access to different kinds of information and knowledge (Granovetter, 1973; 1983). Weak ties, hence, can for instance form a crucial bridge between two densely structured social networks (Granovetter, 1983), and are consequently argued to be of importance in obtaining new information (for instance regarding business opportunities).

Basically, we believe that the results presented in this paper require us to reassess our current approach to clusters as bounded knowledge systems. In this paper we have seen that generating new and innovative ideas by entrepreneurs involves different geographies of interaction. At the very least, the assumption that local knowledge networks (i.e. building local ties) are a prerequisite for regional economic revitalization is premature. New and innovative ideas enter the Amsterdam New Media-cluster through distant contacts as well.

## **DISCUSSION**

When departing from a knowledge-based perspective in studying knowledge dynamics confined to or unobstructed by cluster boundaries, it increasingly becomes clear that geographical space does not seem to be a decisive factor. Having established that knowledge travels great

geographical distances through both weak and strong social ties, is the 'cluster-paradigm', with its emphasis on geographical proximity, the appropriate theoretical lens to make sense of knowledge flows spanning oceans and continents?

The pipeline-thesis developed by, amongst others, Bathelt *et al.* (2004) and Owen-Smith and Powell (2004), appears to take notice of this apparently inconsistency in much literature dealing with localized learning and innovation. As they envision it, pipelines are necessary in order for clusters to maintain at the forefront of technological and market developments. As such, pipelines are considered to add significantly to the local buzz present in a cluster. However, the pipeline thesis appears to overlook the significance of global buzz to entrepreneurs located in a cluster. Global buzz aids entrepreneurs in making sense of current developments in their discipline; developments that often take place at a global level. This global buzz is not distinctly different from its local counterpart, however, the content that is being exchanged is. Global buzz might be conceptualized as an information and communication ecology involving information, gossip, and news about things going on in the field of practice, but with an international outlook. It encapsulates developments taking place outside a cluster, and is distinctly different from pipelines in the sense that this information reaches entrepreneurs through social ties that are not systematically or strategically oriented.

A number of assumptions related to the knowledge-based perspective of clusters do not hold. First of all, the assumption that localized interactions are fundamentally different compared to their inter-local counterparts in terms of tacit knowledge exchange is challenged. In their search for new and creative ideas, entrepreneurs recognized as inhabitants of the Amsterdam New Media-cluster draw both on local and non-local ties in their 'quest' for new and innovative ideas, thus tapping into both local and global buzz. In relation to this, the assumption that inter-local networks or ties are relatively weak or thin and mainly technology driven, while local ties are characterized by rich interaction and understanding, shared values and identities, and trust (Malmberg & Maskell, 2005) does not hold as well. The ego-networks presented in figure 1 clearly show that both local and inter-local interactions manifest in both strong and weak ties. Intriguingly, inter-cluster knowledge linkages serve the purpose of fueling an ideological debate taking place across cluster boundaries. This global, or inter-local, debate, revolving around issues such as the role technology *should* fulfill in people's lives leads to a shared belief system that

surpasses any local knowledge hotspot, thus further challenging our current beliefs concerning clusters as repositories of knowledge.

We would like to offer the reader two basic points for reflection. First, limiting ourselves to the knowledge-based view of clusters, to what extent does it make sense to apply cluster boundaries when studying knowledge flows crossing these boundaries? In other words, to what extent are cluster boundaries (as well as the cluster phenomenon itself) social constructions of our sensemaking minds (Weick, 1995), and more importantly, to what extent do these socially constructed cluster boundaries obscure our understanding of micro-level phenomena such as knowledge exchange among entrepreneurs? Is our language-in-use, the theories we apply, and the hypothesis we construct influencing what we observe even before the actual observation takes place? Are we, in fact, entrapped in this socially constructed reality, to speak with Burrell & Morgan (1979)? And what alternative explanations or paradigms might release us from the constraints associated with this entrapment?

Second, how can we explain the apparently successful exchange of knowledge across cluster boundaries? In the case of this exploratory study, distant interactions appear successful partly because the distance is closed by the existence of strong interpersonal ties among entrepreneurs. However, the concept of relational proximity (i.e. the strength of the interpersonal tie) cannot fully explain why such interactions take place successfully. We may speculate that other forms of proximity can substitute for geographical proximity in the process of knowledge exchange (Boschma, 2005). As pointed out in earlier contributions, the concept of cognitive proximity might very well act as a substitute to geographical proximity (*ibid.*; Amin & Roberts, 2008). But for this contribution, we would especially like to draw attention to the concept of epistemic proximity as a substitute for the lack of geographical proximity. Epistemic proximity basically involves the extent to which ego and alter share a similar world view. The more similar this shared understanding of reality, the higher the amount of epistemic proximity between ego and alter. This concept might be a powerful substitute for geographical proximity because it bridges the contextual and cultural gap associated with interactions not facilitated by geographical proximity. However, this remains an issue to be addressed in future research. A start would be by determining the extent to which different forms of proximity relate to each other as well as to what extent one form of proximity can act as substitute for the other in facilitating tacit knowledge exchange among entrepreneurs (Boschma, 2005).



We conclude that the postulation that knowledge is inherently spatially sticky because of its context-specificity is in need of some fundamental reconsideration. To critically approach the idea of clusters when discussing the phenomenon from a knowledge-based perspective, we need to account for the sociology of knowledge exchange by if we are to come to an understanding of the complex and ambiguous nature of knowledge dynamics within and across cluster boundaries.

### ***Limitations***

This study is exploratory of nature, which implies strong limitations on its generalization. Moreover the data collected are offering a broad perspective but they may not hold when a wider variety of actors would be considered. Notwithstanding the lack of generalizability of the results, we believe that the choice of methods applied is justifiable given the nature of the theoretical problem that lies at the core of this paper, which provides strong indications of the need for a wider set of tools to be applied to the discussion of locality and knowledge exchange.

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APPENDIX SECTION

TABLE 1

Name generator regarding the role of local and non-local contacts with respect to gathering new ideas, inspiration, and opportunities	
<b>Question 1</b> <i>Based on Rodan &amp; Galunic, 2004</i>	Some contacts are particularly useful in helping you to be creative as an entrepreneur, such as helping you to generate new ideas. Who are the key people that help you the most to formulate and generate new ideas?
<b>Question 2</b> <i>Based on Batjargal, 2007</i>	Considering all of the professional contacts you have made in your career so far, who have been most valued contacts in the sense that they were the most important to your creativity and spotting new opportunities?
<b>Question 3</b> <i>(probe)</i>	Please mention contacts who helped you to generate and formulate new ideas, but who aren't located in Amsterdam and/or the Netherlands.
<b>Question 4</b> <i>(probe)</i>	Please mention contacts who have been very relevant in this process, but with whom you rarely interact.

Name interpretation <i>Based on Burt, 1997</i>						
	Frequency of contact (1=daily; 2=weekly; 3=monthly; 4=rare)	Emotional closeness (1= especially close; 2= close; 3= less close; 4= distant)	Duration (1= met within last two years; 2= known for three to five years; 3= known for six years or more)	Friend or Acquaintance (1= friend; 2= acq.)	Geogr. location	Is this person a colleague of yours? Yes or No
<b>Contact 1</b>						
<b>Contact 2</b>						
<b>Contact 3</b>						
...						
<b>How well do your contacts know one another?</b> <i>Rodan &amp; Galunic, 2004</i> 0= not; 1= especially close; 2= distant						
	<b>Contact 1</b>	<b>Contact 2</b>	<b>Contact 3</b>	...		
<b>Contact 1</b>						
<b>Contact 2</b>						
<b>Contact 3</b>						
...						

Social network analysis instrument for research phase 2

TABLE 2

	Ego inter-cluster ties	Ego intra-cluster ties	Total
<b>Weak ties</b>	20 (35)	8 (14)	28 (49)
<b>Strong ties</b>	9 (16)	20 (35)	29 (51)
<b>Total</b>	29 (51)	28 (49)	57 (100)

Cumulative number of ties originating from ego entrepreneurs

Figure 1

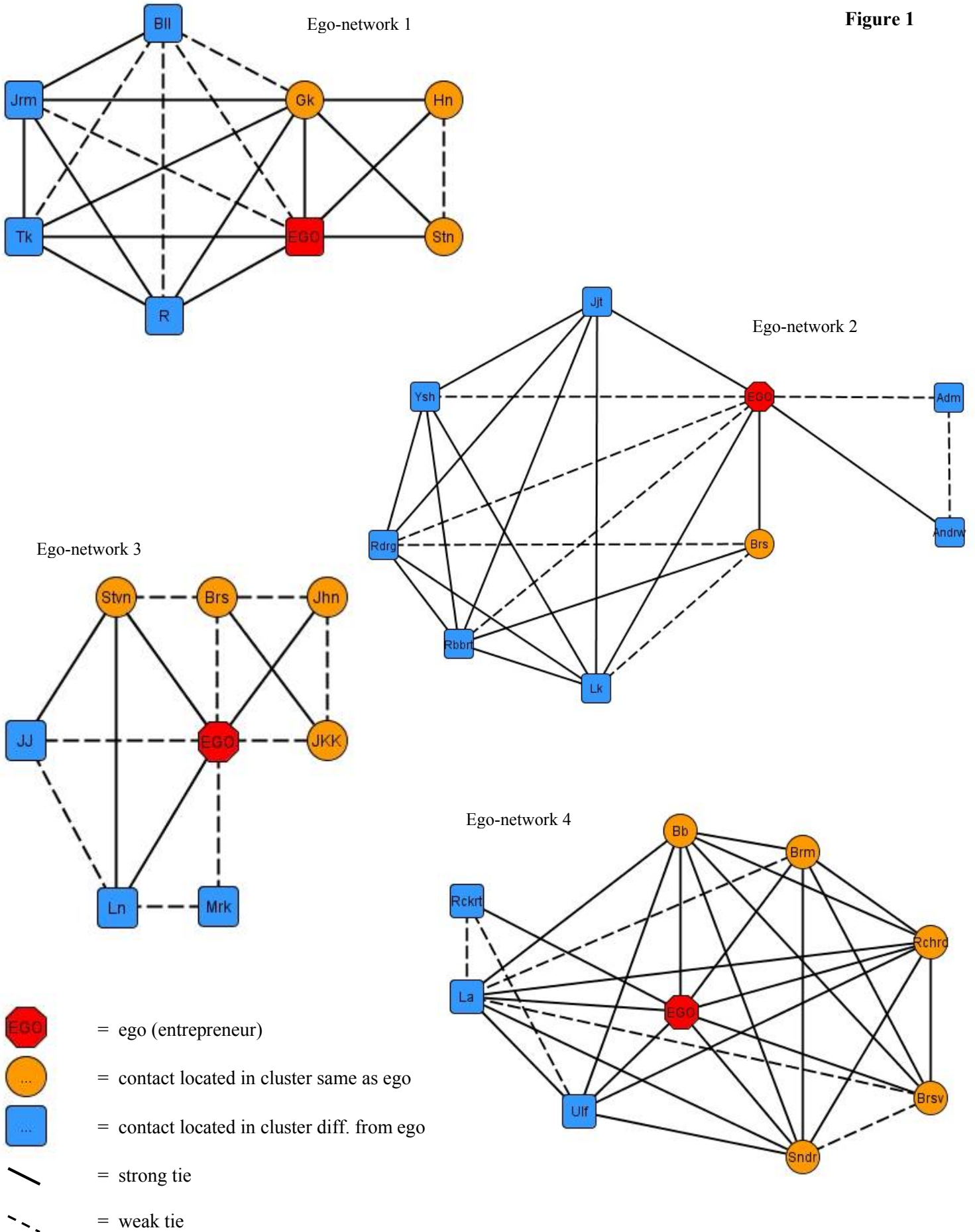
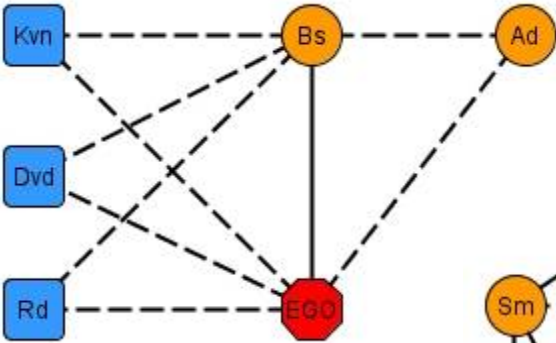
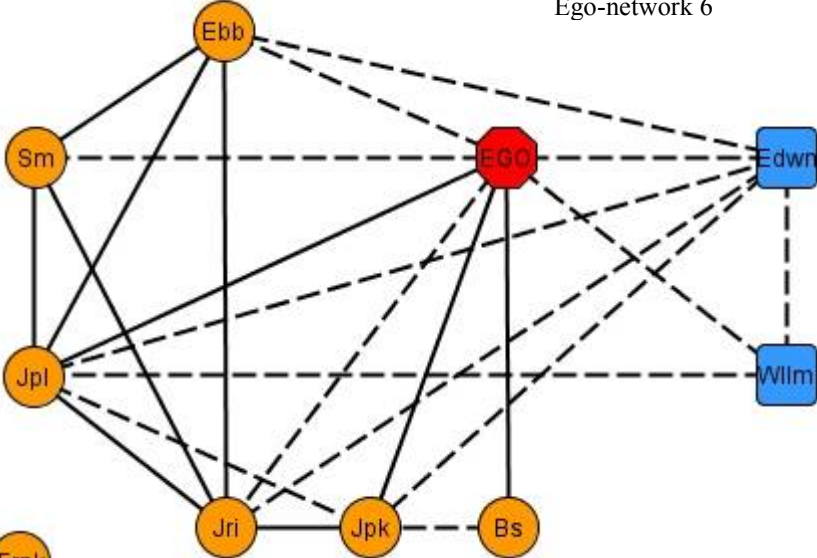


Figure 1 (continued)

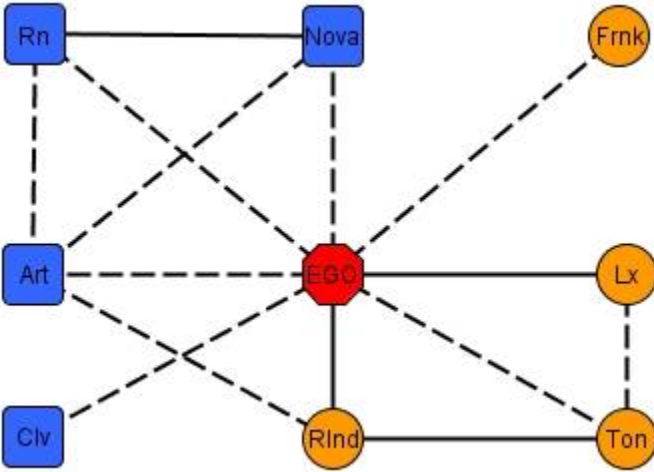
Ego-network 5



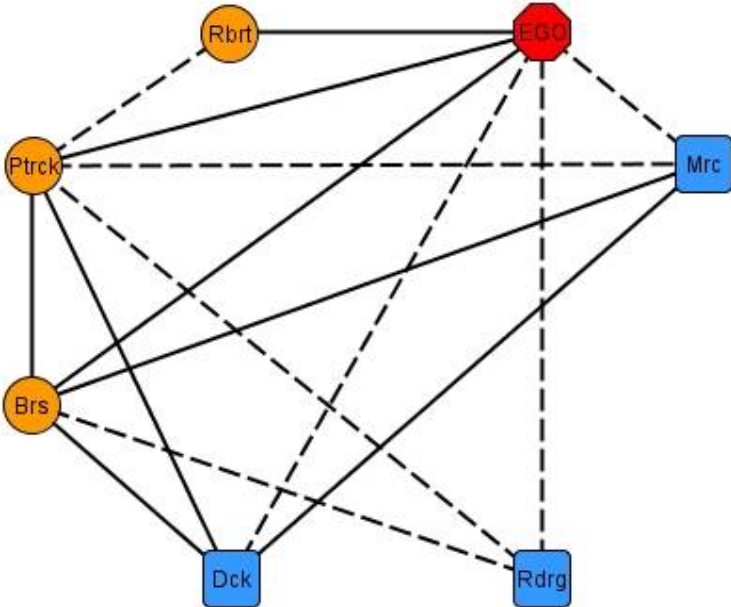
Ego-network 6








Ego-network 7



Ego-network 8



-  = ego (entrepreneur)
-  = contact located in cluster same as ego
-  = contact located in cluster diff. from ego
-  = strong tie
-  = weak tie