Innovation, proximity, and knowledge gatekeepers – Is proximity a necessity for learning and innovation?

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Abstract: Organisational desire for innovation and growth can be best achieved when they are in proximity. Geographical or technological proximity represent network structure in which a focal organisation is embedded, which has structural, cognitive and relational dimensions. Proximity influences innovation indirectly by its influence on agents’ ability to exchange and combine knowledge in four related ways: by giving access to exchange partners that provide opportunities for learning, increasing the anticipation of value, increasing the motivation to exchange, and by giving access to resources necessary for committing exchanges.

Keywords: proximity; learning; innovation; technological gatekeepers; firm strategy; competitiveness; firm’s growth.


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1 Introduction

The systems of innovation approach is an economic theory of the role of learning, where the generation and utilisation of knowledge gatekeepers are seen as core economic processes and where utilisation of knowledge can be understood as “translation of knowledge elements into new products and processes” [Edquist, (2007), p.2]. The systems of innovation approaches emphasise a number of complementary knowledge generating or learning processes. Edquist et al. (2001) describe learning as the process of disseminating existing knowledge and/or production of new knowledge or new combinations of existing knowledge elements. In this sense, learning is used as an overarching concept for the process by which knowledge generation – including both scientific and everyday knowledge – is translated by knowledge gatekeepers and within an organisational innovation and individual learning.

Studies have linked the role of knowledge gatekeepers to innovation and learning. Knowledge gatekeepers were defined as those few individuals whose work is informally connected to the few, well-placed people in a knowledge network [Allen, (1977), p.144]. There have been studies of the role of gatekeepers in learning and innovation from their role in an economic system where they were described as a source of innovation and learning for those firms. In this category, gatekeepers are said to appear to behave like boundary spanners (Sonnenwald, 1995). Boundary spanning is said to have two primary roles:

1. to detect information and bring it into the organisation
2. to send information into the environment presenting the company in a favourable light and allowing innovation and learning to take place.

Studies reviewed show that the two main sources of information are:

1. Business intelligence, which is information about the general environment in which the organisation is operating. Those advancing this line show that firms are able to learn from this and as result they are able to innovate and respond to the changing environment in a more coherent and consistent way.
2. Knowledge gatekeepers can access information from firms other than their own, feeding back into the internal systems which, in return, allows companies to review their strategic position or their choices. As their names suggests, boundary spanners walk around and between the gated, bringing in and sending out.
The concept of ‘learning’ is used in a more specific manner to signify a particular source of knowledge and particular knowledge gatekeepers’ processes that rise out of routine activities. Some authors regard routine activities as the superior source of knowledge for innovation (Lundvall, 2008). Those who supported this line of thinking argued that routine activities and everyday experiences by workers, consumers, etc. influence the agenda determining innovative efforts, by identifying problems or bottlenecks. This concept of learning is similar to March’s (1991), and March’s (2007) concept of ‘exploitation’ as one form of organisational learning, and underlies processes such as ‘refinement, choice, production, efficiency, selection, implementation, execution’ (p.71). An institutional perspective on learning underlies this assumption. Institutional set-ups affect knowledge generations by influencing what problems are regarded as ‘worthy’, how those problems are investigated, and the evaluation of the usefulness of that knowledge. In this way, cognitive and normative rules, traditions, customs, etc. affect perception and choice by influencing what to pay attention to and how to find and implement solutions.

As opposed to learning from routine activities that might not have knowledge generation as an explicit goal at all, knowledge ‘searching’ is a deliberate act, one explicitly initiated and organised to generate knowledge. Consequently, searching is motivated by finding solutions to specific problems or bottlenecks. Searching is therefore organised in “close connection with production and influenced by the commodity logic of the enterprise sector” [Johnson, (1992), p.32]; within firms, special organisations usually carry out searching, like the R&D department and department for market analysis (Lundvall, 2008). According to Johnson (1992) the searching process – being geared towards generating knowledge to be used in production – is often path-dependent, relating to production, but also to past investments, technological paradigms and habits of thought.

1.1 Concept and type of proximities

The concept of ‘proximity’ was introduced by regional scientists (especially in French schools). Proximity followed studies of innovation and learning within the M4 Corridor as well as the Silicon Valley (Pinch et al., 2003). The basic argument has been that proximity allows industries to access knowledge that is embedded within the local system. Later studies by Scot and Florida will consider this issue further to show that the issue of proximity is critical in building business relationships, developing trust and, in some aspects, leading to a certain level of psycho-socio commitment to each other that eventually leads to joint ventures, R&D, and sharing facilities, thereby reducing costs. This clearly leads us to realise that proximity carries several meanings. In order to make the discussion clearer, this article adopts the classification developed by Boschma (2005), who tries to cover various proximities in a comprehensive way. Five different kinds of proximity can be identified and discussed:

1. Cognitive proximity: People who have the same knowledge base and expertise can better learn from each other. Cognitive proximity is based on similarities in technical and market competencies that affect the search and imitation costs when exploring new knowledge. Cognitive proximity serves as a prerequisite for learning and is
more easily achieved via interaction within the same industrial space and supplier link due to the continuity of knowledge transfer. Social proximity and institutional proximity often require geographical proximity to function properly. Capello (2009) demonstrates that social proximity and institutional proximity set in motion an informal and tacit transfer of information and know-how, which contributes to the transformation from a specialised area to an innovative milieu. On the extra-local scale, organisational proximity gives a different meaning to supplier linkages, which facilitates the transfer of tacit knowledge by control and hierarchy.

2 Geographical proximity: This indicates the physical distance between interacting players measured in time or money. Geographical proximity alone is not able to foster knowledge transfer and innovation. As Howells (2002) puts it, the impact of geographical proximity is rather indirect and subtle.

3 Organisational proximity: This refers to the sharing of reference space, such as shared knowledge and experience, that is strengthened by hierarchy and control within the same organisation. With the development of communication and transportation technology, simple co-location is no longer a necessary determinant for knowledge transfer. Organisational networks transcend the boundary of countries and are vehicles of knowledge diffusion.

4 Social proximity: This relates to trust and commitment based on kinship, friendship, and cooperation experience between individuals. Social proximity not only fosters the communication of tacit knowledge, which is difficult to trade in the market, but also reduces opportunist behaviour through the establishment of durable relations. It is often bound spatially because the geographical proximity increases the chances of meeting and communicating.

5 Social proximity in one sense can be seen as a micro-level manifestation of organisational and institutional proximity. But where organisational proximity focuses on the structure of the network and the position a focal organisation has in a network, social proximity focuses on the benefits that accrue to a focal agent by personal connections to other agents, or what Granovetter (2008) refers to as relational embeddedness. The more refined conceptual framework does not undermine the importance of proximity for interactive learning, but highlights that proximity has different sources that might have relatively little to do with physical location. The above debate provides a macro-level framework for understanding the structural and organisational factors that are most likely to contribute to interactive learning and innovation. Proximity is seen as a central frame factor because it enables an easy organisation of face-to-face learning. Disregarding a straightforward geographical argument, the French school of proximity dynamics breaks down the proximity concept to shed light on the multifaceted nature of being close and what it means in innovation processes. A key insight is that different forms of proximity might in some cases be substitutes, but can also be mutually reinforcing. Recent contributions also highlight that proximity should be understood as a dynamic concept, and that the importance of proximity for innovation is likely to be dependent on technological maturity and even the actual stage in the development of a particular innovation partnership. So recent contributions have come a long way in
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attempting to better the understanding of the localisation-innovation relationship, but there is not a lot of empirically-based knowledge about the actual role proximity plays in relationships intended to exchange knowledge.

6 Institutional proximity: Unlike social proximity, which is embedded in social relations between agents at the micro level, institutional proximity is based on shared norms and values at the macro level. It is depersonalised and relies on general trust that is developed and established over a long period of time. Institutional proximity is closely related to organisational proximity. Institutions are defined as cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour [Scott, (2005), p.33]. Institutions are humanly constructed understandings, norms, and rules that structure behaviour and interaction, such as taboos, customs, and traditions, rules of conduct, as well as formal laws and regulations. Institutional frameworks are macro-level phenomena and are embodied in particular social interactions at a micro-level. Institutional proximity is defined as “the degree of congruence between, and acceptance of the legitimacy of, the institutional infrastructure in which agents operate” [Freel, (2003), p.754]. Institutional proximity is closely related to other forms of proximity. Institutional frameworks influence the cognitive models and language that agents use to make sense of the world. Institutions are an inherent part of organisations as well as the environment in which interorganisational relationships are carried out.

1.2 Organizational proximity

While organisational proximity could commonly be referred to as ‘the closeness of actors in organisation terms’, it is defined and viewed differently by different authors. Oerlemans and Meeus (2005) viewed proximity as ‘actors that belong to the same space of relations (networks),’ that is, actors are in interactions in various ways. This supports the argument that integration in a social structure that contributes to achieving coordination of activities in a network. Torre and Rallet (2005) defined organisational proximity as a set of explicit or implicit routines, rules of behaviour, systems of representations and sets of beliefs which allows organisations to coordinate interactions “without having to define beforehand how they must do it.”

2 The role of organisational proximity in upgrading and innovation

The literature on global production networks has provided insights into the role of organisational proximity in industrial organisation for multinational companies and its function as a vehicle of cross-country knowledge transfer. Organisations exist both as a bundle of transactions or contracts and as a bundle of knowledge. Following the logic of transaction cost minimisation, the organisational boundary helps to curb the opportunist behaviour of business partners, such as distorting business information, failing to fulfill commitments or malicious imitation, when rules and trust are lacking. For the global flagship that organises production in developing countries, organisational proximity is conducive to reducing opportunist risk related to physical and human capital investment. In addition, hierarchy and control within the same organisation enable the efficient
downward transfer of knowledge. Many studies on developing countries have shown that most of the firms conduct innovation ‘in-house’ instead of licensing and assigning contractual arrangements to unaffiliated firms.

One of the explanations offered by Teece is that proprietary considerations are assisted by organisational integration, since contracts, proprietary rights and technology transfer via the market are complex and, especially in developing countries, often too expensive. In other words, when the institutional environment, consisting of elements such as property rights and related business laws, is not fully developed, and the embeddings of global firms is not mature enough to ensure social proximity that brings mutual trust, flagship companies tend to restrict knowledge to flowing only within the boundaries of the firm in order to reduce the chances of opportunism and ensure return on internal R&D efforts.

Organisational proximity to leading global firms provides access to knowledge, especially tacit knowledge in advanced technological fields. The flagship typically provides subsidiaries or closely cooperating suppliers with encoded knowledge, such as machinery, blueprints, production and quality control manuals, product and service specifications, and training handouts. Furthermore, latecomer firms also join the global production network in order to acquire tacit knowledge to absorb better the encoded knowledge by having the engineers and managers from foreign partners train on site. Yeung (2009) states the importance of external network building in acquiring capabilities in the Asian context. Morrison (2008) showed that firms gain technological capabilities from participating in global value chains. It is possible that the suppliers upgrade and co-evolve with the buyer when the technological and organisational change enables a more sophisticated supply chain (Yeung, 2008).

In 2004, TCL (Shenzhen) co-established a mobile phone joint venture with Alcatel. In 2007, China Electronic Cooperation subsidiary Sungfei (Shenzhen) acquired the mobile phone operation from Phillips. For many years, Lenovo had failed to make a successful entry into the World wide market, and the all important European and US market was difficult entry to Lenovo for two particular reasons. First, Lenovo business model was built in a Chinese culture, which is distinctively different from that of Western markets. Second the cultural differences and the leadership practices which were particularly based on personal freindship rather than the business interest, all made it difficult for a Chinese market to successfully enter into this all important market. The 2005 completion of an acquisition of IBM’s personal computing (its global PC (desktop and notebook computer) transformed Lenovo into a top-tier (third-largest) global PC. While some business comentators thought that China was interested more into the puchase of the 5% PC business deal of business leader IBM, (e.g., The Economist (US). Dec. 11, 2004 p59US), the acquisition was, in China, seen as necessary for learning and innovation through rapid knowledge transfer-an implicit desire of the Chinese to enhance the management culture, leadership and governance skills at the Chinese largest PC company, Burchfield (2005).

Then Lenovo upgraded from an OEM to an OBM producer. A move that accelerated Lenovo’s learning, and innovation than any other PC company had ever done before. The timeline below shows how lack of proximity can delay learning and innovation.
In 2005, after IBM acquisition, Lenovo announces the closing of a US$350 million strategic investment by three leading private equity firms: Texas Pacific Group, General Atlantic LLC and Newbridge Capital LLC. This move was aimed at furthering a complete value chain integration of Lenovo, a move seen as a complementary necessity to the PC acquisition from the acquisition.

Lenovo establishes a new Innovation Center in Research Triangle Park in New York City. This move was to enable customers, business partners, solution providers and independent software vendors to collaborate on new personal computing solutions. Such a collaboration was going to be Lenovo’s move towards the democratisation of innovation—which should lead to faster knowledge transfer. As a result of this collaboration, Lenovo successfully introduced the industry’s thinnest, lightest and most secure Tablet PC, the ThinkPad X41 Tablet.

By 2006, the proximity provided Lenovo vital information necessary for its R&D and design team all important essential business information that was quickly converted into new products. Within a space of a year, they introduced the first widescreen ThinkPad with embedded wireless WAN, the ThinkPad Z60, available for the first time with a titanium cover. The access to market (through IBM distribution and software support) allowed Lenovo becomes the world’s largest provider of biometric-enabled PCs by selling its one-millionth PC with an integrated fingerprint reader.

The first Lenovo-branded products outside of China debut worldwide. Researchers, scientists and product design teams from around the world combined Lenovo’s heritage in enterprise and consumer PC technology to design the Lenovo 3000 product line, which featured new desktop and notebook models specifically designed to provide worry-free computing to the small business market segment.

Traditionally western clients had seen Chinese Lenovo products as of low quality and therefore unreliable. Following a close collaboration with IBM engineers (known for focus on high quality), registered breakthrough innovation. Lenovo introduced the first dual-core ThinkPad notebook PCs, improving productivity and extending battery life for up to 11 hours. Furthermore, Lenovo technology flawlessly supported the 2006 Olympic Winter Games in Torino, Italy, supplying 5,000 desktop PCs, 350 servers and 1,000 notebook computers. Lenovo also hosts seven internet i.lounges for use by Olympic athletes and visitors. This extract was adapted from http://www.pc.ibm.com/ca/about_lenovo/companyhistory.html.

Tables 1 and 2 are examples of upgrading by enhancing internal absorptive capacity and strategically recognising the coupling chances with leading global firms.

Organisational proximity refers to the closeness of actors in organisational terms. The concept is used somewhat differently amongst authors on proximity, and on different levels of analysis. Oerlemans and Meeus (2005, p.94) define organisational proximity as actors that belong “to the same space of relations (networks), i.e., actors are in interactions of various natures”. Torre and Rallet (2005, p.375) define organisational proximity as a set of explicit and implicit routines, rules of behaviour, systems of representation and sets of beliefs which allows organisations to coordinate interactions “without having to define beforehand how they must do it”.

The first definition pertains to an embeddedness argument in which the integration in a social structure contributes to achieving coordination of activities in a network. The social structure is the “impersonal configurations of linkages between people and units” (Granovetter, 1985) – who you reach and how you reach them (Nahapiet and Ghosal, 1998). The character of the links and the structure of the network give the actors in the network access to resources and opportunities. This structural embedded concept of proximity is descriptive and addresses a network level of analysis. Torre and Rallet’s (2005) concept is much broader and addresses predominantly a dyadic level of analysis. It also explicitly incorporates institutional dimensions of proximity.
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<th>Name</th>
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<th>Overview</th>
<th>Impact on innovation</th>
<th>Implications and lessons learnt</th>
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<tr>
<td>1 Nissan Strategic alliance Renault</td>
<td>Two global companies linked by cross-shareholding, combined vehicle sales have increased from 4.9 million units in 1999 to more than 7.27 million units in 2010 (including sales AvtoVAZ)</td>
<td>Maximise synergies through their complementary strengths in product line-up, procurement, R&amp;D, marketing, and personnel training and other benefits through cooperation. Nissan pilots the development of new gasoline engines while Renault focuses on diesel engines. Nissan actively participated in the development of the Renault group’s first cross-over, which was conceived and designed by Renault, and is manufactured by Renault Samsung Motors in South Korea.</td>
<td>Good management, multi-faceted and versatile approach Good understanding of the factors that determine the norms of different countries Good understanding of how the firm is seen by other partners in the venture Learning to adapt well while remaining consistent with their own company cultural values. Transferring Renault staff (COO) to Nissan was considered one of the contributing factors to the success of the alliance. Cooperation and synergies to capitalise on strengths Setting up of common platforms, supplier base and purchasing strategy has proven a good idea (save time for new introduction production) Complementary market support between partners Combined expertise and technology sharing</td>
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| 2 BMW Merger Rover | • BMW – Rover merger where identified strategic failings.  
• BMW invested £2.8 billion in acquiring Rover and kept losing £160,000 annually.  
• Strategic objective: to broaden the BMW product line, expand market.  
• First combined product was the Rover 75, which competed directly with existing BMW mid-range models.  
• Existing Rover cars were out of date and uncompetitive, and the job of replacing them was left far too late. | • There was little emphasis on innovation in the first place. While productivity is the key for Rover’s survival, BMW needed to expand its market and product base. BMW did not realise the doing this slowly tarnished its product image by developing cheaper cars.  
• The strategy was to broaden the buyer’s product line. But the first combined product, the Rover 75, is directly competitive with BMW’s mid-range models. The other Rover cars were too old and uncompetitive to broaden anything; and the task of replacing them has been left far too late | • Investing in the wrong assets. BMW paid only £800 million for Rover, but invested £2 billion in factories and outlets, but not in developing products  
• Insufficient ‘due diligence’ which resulted in the following aftershocks  
• After a merger, the management span at the top became wider, and imposed new strains on employees  
• Difficulties in adjustment to the new realities and cultural values  
• BMW sets too high standards unexpected delays (intolerable for BMW), BMW set targets and expected 100% acquiescence, Rover was in the habit of reaching only 80% etc. of the targets set.  
• Walter Hassel us, the German manager of Rover after the merger, was respectful of the Rover’s existing culture that he failed to impose the much stricter BMW methods, and ultimately lost his position. |
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| 3 Chrysler Merger Daimler Benz | • This merger was struck in 1998 creating a combined value of USD130 billion. The merger with Chrysler gave Daimler-Benz direct access to the US mass market while Chrysler’s, whose US sales were flat, gained access to overseas markets.  
• The merger hoped to achieve a number of synergies:  
  • Combine German expertise in luxury cars with agile US management and mass-market expertise.  
  • Attain economics of scale that would reduce costs, making Daimler-Chrysler an auto giant that could face brutal competition from Japanese, German and US automakers.  
  • Chrysler had creative styling and low development costs. It had an entrepreneurial culture and flair for doing things quick, cheap and lean. This expertise could be transferred to Daimler, which had higher developmental costs.  
  • Daimler had a global distribution network second to none, which could be leveraged by Chrysler. | • Chrysler has improved its productivity by 8.3% and achieved cost savings in design and engineering.  
• In 2004–2005, Chrysler introduced new vehicles – a clean break from the past where it struggled to keep pace with the market. | • The impact of this merger has been disappointing. Chrysler’s market share in the US declined from 16.2% in 1996 to 13.2% in 2003. Operating profits turned negative in 2001.  
• Chrysler’s product pipeline did not have enough products to offset intensifying pressure from competition in the bread-and-butter segments like minivans and sport utility vehicles.  
• The aging model lineup contributed to the fall.  
• In 2003, revenues of Chrysler Group segment decreased, primarily due to the appreciation of euro against dollar, higher sales incentives and lower unit sales.  
• Chrysler’s top managers retired, quit or in several cases were pushed out as a result of the merger. So the flair for doing things cheap, quick and lean did not seep into the merged entity. |
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<td>Lenovo IBM PC Division (2005)</td>
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<td>Lenovo agreed to buy IBM’s loss-making PC business on December 8, 2004, for US$1.75 billion. Lenovo is now the world’s third-largest PC maker, after Dell and Hewlett-Packard. HQ: China Grounds for acquisition: 1 Lenovo strong on desktops, IBM strong on notebooks and high-end corporate customers 2 More international market share and awareness 3 Rid the stereotype view of poor quality Chinese-made products</td>
<td>• Improved capital resources: IBM ThinkPad® notebooks and ThinkCentre™ desktops are now part of the Lenovo team – the award-winning engineers, the manufacturing teams, the sales representatives, the business partners.  • First mover position: Tablet PC, Thinkpad X41  • Fast results  • Lower procurement and marketing costs  • Wave of new product introductions</td>
<td>• The need for companies to continually reinvent themselves  • Investing in ‘long-term-value’ of clients  • Set clear, sustained and consistent emphasis on innovation  • Complete synergy at all strategic and business level  • Process should be rapid and reassuring  • Cultural integration considered the key contributor to success.</td>
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<td>2 Dell Acquisition AppAssure, (a developer of data protection software for physical and virtual server and cloud infrastructures)</td>
<td>Dell’s acquisition objective: preserve the characteristics that make the partner company successful, while leveraging Dell’s strengths to grow the business and expand its offerings to its global customers The AppAssure acquisition is Dell’s latest investment as it broadens its enterprise portfolio for a complete range of data centre products and solutions and extends its fluid data architecture to constantly adapt to change, deliver business results faster, and protect data everywhere. • Customers and partners will now be able to put the right data in the right place at the right time for the right cost so they can better manage the growing complexity in IT and the rapid explosion in data using Dell’s full portfolio of storage network and network attached storage solutions, based on its fluid data architecture, and is complementing these offerings with security, data compression and backup, and restore capabilities. Dell simplifies technology to make storage products more accessible to businesses of all sizes.</td>
<td>AppAssure’s unique architecture delivers innovative cloud-enabled backup and replication solutions that meet the challenges of protecting the explosive growth of data in both virtual and physical environments. At a practical level, AppAssure enables Dell customers to seamlessly move and replicate data across existing platforms—from an equal logic array in a remote office to a compelling array at a data recovery site.</td>
<td>• Future results are forward looking statements as this is a recent take over</td>
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| 3 HP | Merger Compaq Computer Corporation (2002) | • Some considered the decision to merge was sound as both companies were caught in the middle.  
• September 4, 2001, HP and Compaq announced the merger. HP’s stock closed at $18.87, down sharply from $23.21 the previous trading day. On May 3, 2002, when the deal was officially consummated, the stock ended the day at $17.44. As of September 21, 2004, the shares stood at $18.70 – down 19% from the beginning of the year | At first managers were overly focused with the process, major job retrenching and reorganising.  
Retained HP’s traditional commitment to innovation but expect the new company to be more results-oriented than it had been before and be able to move faster to meet new challenges.  
Result: economies of scale in the PC business reaping hefty profits from its printer and print-cartridge products, a shot at competing with Dell, a low-cost, direct-marketer of PCs. | The merger is on track and is proceeding much better than expected, some uncertainties whether the merger will eventually reap more dividends than it has so far.  
Very good integration management  
Hidden agenda: “It’s not just about HP buying Compaq; it’s about a systematic renewal of Hewlett-Packard.” Like the bitter shareholder battle in 2002 with a member of the Hewlett family and others who opposed the acquisition, he adds: “We know about the hostile context in which it was pursued and how difficult it was to pull this thing off.”  
Unmanageable market: ensuring that demand for its PCs stays high, the company has a huge installed base of HP and Compaq customers, they are not sure of customer loyalty if their equipment gets too old etc.  
Management by smaller divisions and segments like separating and reinvigorating of the PC segment makes the process easier and more successful  
Integrating the operations and cultures of the two companies was not too successful  
Due diligence and preparation was not adequate  
They have been able to do a lot of positive things in terms of the operational side but it is important not to be too overly involved with the process. |
Although the internationalisation of R&D activities has grown significantly since the 1990s, technology and knowledge to which domestic firms have access is still limited and mostly low-end. Secondly, global buyers tend to promote incremental product and process upgrading and oppose upgrading if this creates opportunities for suppliers to acquire a broader range of customers. Therefore, the next section discusses the role of social proximity in fostering innovation as a means of overcoming the shortcomings of organisational proximity.

2.1 Organization learning and innovation

What we learn from the examples presented in Table 1 and Table 2 is that organisational proximity and learning should be perceived as essential for continuous performance improvement and long-term competitiveness because learning directly influences innovation and innovation affect performance. While knowledge, internal and external and learning ability is not only a source of competitive advantage but needs be transferred to all levels of the organisation because increasing organisation performance leads to improvement in both learning and innovation (Kanchana et al., 2011). As Stevens and Dimitriadis (2011), argues, organisational learning is depended on the presence of good learning strategies that enhance the effectiveness of the learning process and organisations should encourage learning during the innovation process. But equally, it is not right to say organisation performance can be related to proximity, learning alone because the decision decisions of proximity are of strategic nature (see Table 1 and Table 2 for examples on this). That is, the motivation and desire for growth, the level of innovation orientation of an organisation will determine its degree of desire and inform decision of the best form of proximity.

2.2 Organization trust and innovation

Trust, desire for innovation are viewed as primary factors that may influence the decision to be or not to be engaged in a proximity. In a recent empirical study, Czop and Leszcynska (2011) has demonstrated that in manufacturing industries with competitive and corporate entrepreneurship, organisational culture and creativity of a company were imposed as equally important necessities needed to increase the level of company’s innovativeness. In this era of exponential growth in innovation and the demand for better decision making, ‘trust’ have never been so important (Paiva and Goncalo, 2008). For example, recent empirical study evidence found that employees often trust their companies more that their leaders and innovation is mostly affected by trust in supervisors (Krot and Lewicka, 2011).

2.3 Role of organisational proximity in learning and innovation

Organisational proximity is viewed by leading global firms as access to knowledge, especially tacit knowledge in advanced technological fields. The flagship typically provides subsidiaries or closely cooperating suppliers with encoded knowledge, such as machineries, blueprints, production and quality control manuals, product and service specifications and training handouts. Yeung (2009) demonstrated the importance of external network building in acquiring capabilities in the Asian context (see Table 1 and Table 2 for examples). For illustration purpose, the Lenovo acquisition of IBM personal
computers shows that firms gain technological capabilities from participating in global venture chains and, as research shows, proximity allows suppliers to upgrade and co-evolve with the buyer when the technological and organisational change enables a more sophisticated supply chain (see the case of Dell computers). What the Lenovo and IBM/Dell case studies show is the benefit of proximity.

2.4 Geographical proximity – a precondition for innovation?

Innovation requires collective processes of organisational learning and durable relationships that will result in interdependence, changing expectations and conflicting interest. This requires trust in the other’s intentions and competence to reach a satisfactory agreement. Also, a free and timely exchange of ideas and information is crucial for innovation; openness can only be achieved if trust is present (De Jong and Woolthuis, 2008).

The R&D spillover literature emphasises that knowledge is hard to appropriate, as well as hard to transfer across great distance (distance decay effect). As a result, locally-accumulated knowledge spills unintentionally over to firms located in the region. A central argument in this literature is that spatial proximity leads to increasing interaction between agents, in the form of informal social interaction, networks, and mobility. From these largely informal contacts, knowledge is transferred over organisational boundaries (Almeida and Kogut, 1999).

Information and relational resources like trust and mutual understanding are resources available through such local ties, which influence the ability to generate and exchange knowledge (Nahapiet and Ghosal, 1998). The inherent argument in this ‘localisation thesis’ is that since tacit knowledge and interactive learning are sources on innovation, co-localisation is beneficial for innovation since it enables easy organisation of frequent face-to-face contact both in user-producer relationships, between competitors and in social networks. “Territorial closeness to organizations in the same and related industries affect the ability to receive and transfer knowledge; end encourages risk taking and sharing” (Oerlemans and Meeus, 2005).

A great deal of evidence has been provided about the benefits of colocation for learning and innovation. Case studies of particularly innovative regions highlight the benefit of local learning processes for innovation. Statistical studies show that highly innovative firms tend to cluster in specific geographical regions and that firms tend to source external knowledge from firms located in geographical proximity (Jaffe et al., 1993).

But at the same time, recent research provides findings that contradict the localisation thesis. Empirical data indicates that there is relatively little interaction between firms located in the same place (Doloreaux, 2006; Malmberg and Powers, 2005), and that firms in highly innovative regions primarily source external knowledge from non-local sources (McKelvey et al., 2003). The data presented in the tables herein (e.g., Tables 1–6) shows an increasing internationalisation of an increasing internationalisation of R&D and use of international technology alliances as well as use of distributed innovation projects (Alderman, 2005; Bonacorssi and Rossi, 2003). In light of this, several researchers concludes that that colocation is neither a necessary nor a sufficient condition for innovation (Breschi and Lissoni, 2009; Gallaud and Torre, 2005; Boschma, 2005).
These findings have led several analysts to conclude that the actual mechanisms linking geographical proximity and innovation are under-specified and not sufficiently understood (Breschi and Lissoni, 2001), and that the relationship between learning, innovation, and proximity is more complex and varied than what is portrayed in the regional economics literature. Critics also highlight that the tacit knowledge argument for localised learning is based on the assumption that transfer of tacit knowledge always requires face-to-face interaction, which theoretically and empirically cannot be proven (Torre and Rallet, 2005). It is further assumed that the localised learning theory emphasises particular learning processes and stages, particularly related to routines and incremental adjustments (Hansen, 1999; Gallaud and Torre, 2005). A few researchers have investigated conditions that are likely to influence the relationship between localisation and innovation, such as firm and country size (Beugelsdijk and Comet, 2002), sectoral dynamics, and phase of technological development (Gallaud and Torre, 2005). This insight has lead several writers to emphasise that proximity is a multi-dimensional concept, encompassing different dimensions of relatedness and distance which are not exclusively related to territory. These authors argue that an improved understanding of proximity might show some promise in illuminating the black box of the ‘localisation-innovation’ relationship.

In particular, processes of learning by interaction are related both to the interaction with upstream/downstream sources of knowledge (Kanchana et al., 2011) including suppliers and customers, and to the collaboration with other firms and scientific organisations (such as universities and research centres). On the contrary, processes of learning by imitation are based on the observation of what competitors and other organisations are doing and on the absorption of their developments in science and technology. On the basis of this distinction, it is possible to recognise two main types of knowledge relationships between nodes – collaborative and non-collaborative – created through interaction and imitation learning processes, respectively.

What we see moreover, is that explorative activities are important to discover new knowledge domains and opportunities, access new sources, and activate renewal mechanisms. However, once the new knowledge has been acquired, an efficient exploiting capability plays a fundamental role for an effective use of the results of this knowledge searching activity and for the generation of economic returns. Studies carried out in the field of network theory have clearly shown that nodes can assume different roles, according to their position inside networks. With this regard, nodes are characterised by a high degree of centrality and absorptive capacity, generally known as knowledge gatekeepers.

3 Moving forward and conclusions

This paper attempted to shed light on the following question: Is proximity always necessary for interactive learning in innovation processes? To answer this question, the paper started out with analysis of the learning concept of the differences between routine learning, search, and exploration. Based on this review, interactive learning was interpreted as an exchange process in which effective exchange would require a balance between novelty (distance) and familiarity (proximity). The question is how this balance is achieved.
The regional economics literature has focused on localised learning processes, emphasising that geographic proximity is beneficial for innovation because colocation enables frequent face-to-face interaction required for exchange of tacit knowledge. The French school of proximity dynamics have challenged this assumption by pointing out that although geographic proximity is of obvious importance, this variable does little to explain what features of proximity positively impacts on interactive learning. What is it about being close that is beneficial for interactive learning? They attempt to open up the ‘black box’ of the localisation-innovation relationship by arguing that proximity is a multidimensional phenomenon.

Further, they claim that different dimensions of proximity can be mutually reinforcing, but also in some cases substitutes. But even though their taxonomies of dimensions provided a more refined picture of proximity, the actual relations between the dimensions and how closeness actually impacts exchange processes has not been made clear. Although the recent multidimensional framework of proximity represents an important contribution, the present framework still has a shortcoming, as they are not able to link proximity as a structure or precondition for interactive learning to actual interaction processes. The strength of the alternative proximity concepts vis-a-vis a strictly geographical interpretation is that they emphasise the relational character of proximity, thereby illuminating the ‘soft architecture of learning’. However, literature to date has done relatively little to clarify how proximity actually influences learning processes.

When we pull together all the evidence available thus far, we can develop the thesis that although organisational desire for innovation and growth may exist, this can be best achieved when they are in a proximity. The figure reflects this hypothesis.

**Figure 1** Organisational innovation and learning is best achieve in a proximity

The proximity concepts as described in recent contributions might be usefully reconceptualised within this frame. Geographical or technological proximity represent network structure in which a focal organisation is embedded, which has structural, cognitive, and relational dimensions. Proximity influences innovation indirectly by its influence on agents’ ability to exchange and combine knowledge in four related ways: by giving access to exchange partners that provide opportunities for learning, by increasing the anticipation of value, by increasing the motivation to exchange and by giving access to resources necessary for committing exchanges. Future studies should clearly show how proximity influences the agents’ opportunity, willingness and ability to exchange knowledge. Furthermore, such studies will consider aspects that are embedded in a structure (such as culture, trust, etc.) because they cannot exist independent of the relationships.

Finally, innovation processes can be seen as the interaction between different types of knowledge, the incremental and the radical, exploitation and exploration, distance and proximity. As a consequence, we need to better understand how these connections
happen in practice. An implication of this is that we need an improved understanding of innovation processes focusing on the micro-dynamics of relationship formation and development, as it is at this level that proximity influence interactive learning. This also entails that we should seek to understand innovation processes across different levels of analysis, and attempt to link structural characteristics with processes research.

References


Innovation, proximity, and knowledge gatekeepers


