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## GEOGRAPHY | RESEARCH ARTICLE

# “I want to shake your hand before ...”: The role of clients, knowledge exchange and market dynamics in southern Italian software firms

Giuseppe Calignano<sup>1\*</sup> and Luca De Siena<sup>2</sup>

**Abstract:** This study aims to assess the importance of clients in multi-scalar networks leading to learning competence and knowledge exchange. Furthermore, the difficulties encountered by firms located in a peripheral and marginally innovative area in signing commercial agreements with partners located in distant regions are tackled. Our findings, based on qualitative interviews, reveal that clients are considered to be the most important partners by the founders, owners and professionals of software firms located in the marginally innovative province of Lecce (southeastern Italy). Furthermore, being located in a peripheral area is not seen as a limitation from the technical–infrastructural viewpoint thanks to the opportunity offered by new technologies (e.g. the Internet) and computer-mediated communications. Conversely, the contracting of business agreements with partners located in distant markets is negatively influenced by the geographical distance from potential clients due to the need for previous acquaintance or face-to-face contact engendering trust.

**Subjects:** Social Sciences; Economics, Finance, Business & Industry; Innovation Management; Human Geography; Regional Geography – Human Geography; Economic Geography

**Keywords:** knowledge flows; proximity; peripheral areas; ICT sector, software firms; software firms; southern Italy; qualitative interviews

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### PUBLIC INTEREST STATEMENT

There is a widespread consensus that clients are relevant sources of knowledge leading to innovation for firms operating in given sectors. Software firms located in peripheral regions cannot benefit from a critical mass of potential local clients. At the same time, they face difficulties in reaching distant clients and stipulating contracts with them. This paper aims to determine how important clients actually are for software firms located in a peripheral and marginally innovative area, such as the province of Lecce (southern Italy), and where these clients are primarily located. Our findings reveal that the peripheral location of firms is not a limitation from the technical–infrastructural viewpoint by virtue of the opportunity offered by new technologies. Conversely, business agreements with more distant partners are negatively influenced by the spatial distance from potential clients. This is mainly due to the lack of direct face-to-face contacts engendering trust between the two parties.

## 1. Introduction

The present article is based on two major arguments: first, nowadays inter-organisational knowledge exchange takes place at various geographical scales and, second, clients are essential actors in knowledge exchange and learning competence dynamics.

With regard to the first premise, economic studies with a geographical background have stressed the positive effects at the regional level deriving from the co-location of innovative firms and other types of organisations (i.e. universities, research centres, public authorities, agencies, associations, etc.) in core areas (e.g. Saxenian, 1994; Storper, 1995). According to the findings of several studies, the most innovative regions usually benefit from a critical mass of innovators (Isaksen, 2001; Isaksen & Tripl, 2014; Storper & Venables, 2004) creating favourable spillovers and knowledge exchange based on frequent interactions (Audretsch & Feldman, 1996). Following this argumentation, peripheral regions in geographical and innovation terms are characterised by sparse innovative firms, organisational and/or institutional thinness (Isaksen & Tripl, 2014) and limited interactions between the few actors involved in knowledge exchange dynamics.

However, our hypothesis is that firms located in peripheral areas characterised by a weak socio-economic fabric can benefit from external sources of knowledge by also connecting themselves to neighbouring and distant hubs and regions. This hypothesis was formulated by theoretical studies aiming to examine the spatial and relational dimension of knowledge exchange and is supported by several empirical findings revealing the positive effects of long-distance relationships and collaborations (Asheim & Isaksen, 2002; Balland, Boschma, & Frenken, 2015; Bathelt, Malmberg, & Maskell, 2004; Bathelt & Henn, 2014; Boschma, 2005; Fitjar & Rodríguez-Pose, 2011a, 2011b; Rallet & Torre, 1998, 1999; Sternberg, 2007; Torre, 2008).

Our second assumption regarding the essential role of clients in knowledge exchange and learning competence dynamics is backed by several studies in fields such as management and economic geography (e.g. Bettencourt, Ostrom, Brown, & Roundtree, 2002; Calignano & Quarta, 2014; Grabher, 2004; Hanssens, Derudder, Van Aelst, & Witlox, 2014; Hertog, 2002; Ibert, 2004; Isaksen, 2004, 2006). According to Tripl, Tödtling, and Lengauer (2009), one of the most important contributions in this sense with regard to software firms—the economic actors to which the present study refers—was made by Segelod and Jordan (2004), who demonstrated that clients are a very important source of knowledge in each phase of software development projects (from the initial idea to the commercialisation phase). To the extent of our knowledge, although several studies have tackled the role played by proximity and distance in knowledge creation and diffusion, there is a lack of studies in economic geography analysing both knowledge exchange and market dynamics. In this paper we specifically use the term “market dynamics” to refer to the opportunities and challenges experienced by software firms in concluding commercial agreements with potential near and distant clients.

Starting from these brief considerations, the following research questions are tackled in this paper. How important are clients in knowledge exchange and market dynamics for software firms located in peripheral and marginally innovative areas compared with other economic actors (i.e. competitors, suppliers, universities and other research establishments, etc.)? Where are these clients primarily located? What are the major difficulties encountered by software firms located in lagging areas in terms of knowledge exchange with local and more distant clients, and what about market dynamics?

Furthermore, other very important related research questions, including the motivations pushing entrepreneurs to establish their firms in a marginally innovative and peripheral area, the role of direct personal contact and the relevance of firms' reputation in market dynamics, are also tackled.

A qualitative method based on a structured questionnaire and in-depth interviews conducted with founders, owners, associates, commercial managers and software developers was adopted with the objective of answering the aforementioned research questions. Furthermore, reports on the socio-economic fabric of the province of Lecce—the geographical unit to which this study refers—and data provided by the recent Italian Industry and Services Census (Istat, 2011) were used to offer a detailed overview of the regional socio-economic fabric and the characteristics of the information and communication technology (ICT) sector in the area under analysis. According to the OECD (2006–2007) classification, the ICT sector is made up of three distinct layers, manufacturing industries, trade industries and service industries, as described in more detail later (see Section 3.1).

This paper aims to contribute to the geographical debate on innovation dynamics in peripheral and marginally innovative areas. The role of clients is examined thoroughly with the objective of confirming the previous empirical findings according to which it is precisely clients who represent one of the most important economic actors in knowledge exchange potentially leading to innovation (e.g. Isaksen, 2004, 2006; Tripl et al., 2009). Moreover, the present article aims to narrow the gap in economic geography with regard to knowledge flows and market dynamics in software firms by tackling the two issues simultaneously. Specifically, one of the major purposes of this study is to assess whether geographical proximity actually plays a crucial role in knowledge exchange, learning competences and market dynamics or, conversely, whether different factors (e.g. computer-mediated communications, short-term visits, etc.) effectively substitute permanent co-location (e.g. Boschma, 2005; Torre, 2008). The decision to analyse these relational mechanisms and geographical dynamics in the software sector was determined by the technology and infrastructures mainly used by software developers to carry out their commissioned work (e.g. the Internet), which are potentially less sensitive to geographical distance (e.g. Cairncross, 1997; Castells, 1996, 2004).

This paper is organised as follows. In Section 2, the literature regarding knowledge exchange, proximity and the role of clients in knowledge and market dynamics is reviewed with the aim of providing the theoretical background of the study. In Section 3, the socio-economic context in which the software firms located in the province of Lecce operate is illustrated and the main characteristics of the aforementioned firms are outlined. In Section 4, the methodology adopted is thoroughly described. In Sections 5 and 6 (divided into further sub-sections), the results of the case study are illustrated. Finally, in Section 7, the major results of the study are discussed and the conclusions are presented.

## **2. Knowledge flows, proximity and the role of clients in knowledge exchange and market dynamics**

The “open innovation” model is a management paradigm theorised by Chesbrough (2003) according to which two major factors, the greater mobility of highly skilled workers impeding firms from controlling their proprietary ideas completely and the growing availability of private capital, have made the boundaries between firms and the external environment increasingly “porous”.

The differences from the previous “closed” model of innovation are immediately evident. Before the rise of the so-called “knowledge economy” (Brinkley, 2006), firms relied exclusively on the human resources employed in their own laboratories and competed on the job market with the objective of hiring the most talented skilled workers. The recipe of that old model of innovation was crystal clear and linear: the task of the creative workers was to develop new inventions defended from the possible decoding of other firms by means of intellectual property rights. Afterwards, these patented inventions were sold on the final market and their success led to new investments in R&D and successful ideas with commercial potential.

Globalisation has broken that linear model of innovation and opened up new opportunities and challenges, especially for firms located in peripheral and marginally innovative regions. According to the definition of “open innovation” (Chesbrough, 2003), today innovation is no longer exclusively an

intramural phenomenon and firms—be it from choice or necessity—cooperate with each other with the objective of improving their innovative capabilities.

As other studies have highlighted, although various factors influence the innovativeness of firms and regions as a whole (i.e. investment funds, infrastructure, human capital, etc. Calignano & Hassink, 2016; Calignano & Quarta, 2015), nowadays knowledge exchange is one of the main drivers of innovation and economic growth. In this framework the geography of innovation has been changing drastically during the last two decades, and innovation networks at various geographical scales are becoming increasingly important in the creation and diffusion of knowledge leading to innovation. Specifically, the growing importance of long-distance connections primarily fostered by the irruptive and very rapid growth of new technologies, such as the Internet (Castells, 1996, 2004; Taylor, 2001), has been demonstrated by several theoretical and empirical studies (e.g. Asheim & Isaksen, 2002; Bathelt & Henn, 2014; Fitjar and Rodríguez-Pose, 2011a, 2011b; Sternberg, 2007). These elements prompted Cairncross (1997) to predict the “death of distance”.

The role of geographical proximity is one the most controversial topics in fields such as economic geography, regional science and innovation studies. Morgan (2004) firmly contested Cairncross’s view by affirming that the “death of geography” and “geography matters” are two schools that can co-exist. This argumentation seems to be confirmed by the very diverse results of several studies.

In fact, some authors have suggested that geographical proximity is no longer an essential requirement for exchanging knowledge and that temporary physical proximity (Torre, 2008), short-term visits (Boschma, 2005) or computer-mediated communication (Bathelt & Turi, 2011) can substitute the permanent co-location of firms and their partners (i.e. other firms, clients, suppliers, universities, research centres, etc.). Conversely, other empirical evidence has shown that geographical proximity remains a crucial factor in the circulation of knowledge in clusters of co-located organisations (Cooke, 2002; Porter, 1998; Sonn & Storper, 2008; Storper & Venables, 2004), even though the results of a recent study conducted by Fitjar and Rodríguez-Pose (2017, p. 36) highlighted that connections leading to innovation “did not emerge from casual encounters, personal relationships, or serendipitous events, but were fundamentally purpose-built”.

In other words, firms select the actors with whom they collaborate and the mere co-location of firms is not an element that automatically generates innovation in clusters, urban areas and regions. Furthermore, in the case of firms located in peripheral areas, face-to-face interactions cannot be considered as an option. These firms are obliged to establish linkages with economic actors located in distant locations, since they need to access products, markets and technologies that are not developed in the area where they were founded and operate (Bathelt & Turi, 2011).

Despite the different perspectives and findings of their studies, all of these authors agreed on the importance of cooperation between economic actors and the role played by knowledge exchange based on collaboration in innovation dynamics.

Opposed to Weterings and Boschma (2009), many studies have highlighted that clients are very important partners in the knowledge exchange created and fostered by software firms. According to Segelod and Jordan (2004), linkages with clients are the most important knowledge sources for software firms in each phase of software development (i.e. initial idea, development and commercialisation). Trippel et al. (2009) analysed the knowledge sourcing of the Vienna software cluster by adopting a spatial perspective and distinguishing different types of knowledge links (i.e. market relations, formal networks, spillovers and informal networks). Confirming Segelod and Jordan’s (2004) findings, the results of their survey revealed that clients play an outstanding role in knowledge flows and that software firms consider clients—irrespective of their location—to be a very relevant source of knowledge in dynamics leading to both radical and incremental innovations (Trippel et al., 2009). Bettencourt et al. (2002) also stressed that clients serve as co-creators or co-producers of knowledge-based solutions. Similarly, the structured interviews conducted by Ibert (2004) in Munich

(Germany) highlighted that software development and commercialisation are predominantly driven by the demand side (“Each member of the team that is involved in a customer project is called upon to prick his ears and listen to, ‘what does the client want’, ‘what does he need’ and ‘what could he need’”; Ibert, 2004, p. 1537). According to the same author, in some cases a client’s demand for consultancy enables firms to take the initial steps towards developing a new product.

Although Isaksen (2004, 2006) confirmed the significant contribution of clients to software firms located in Norway in terms of learning competences, his studies on the topic revealed other interesting aspects regarding the spatial dimension of knowledge exchange. Specifically, he stressed that the high concentration of software service firms in Oslo is influenced by demand-side factors, such as the benefits deriving from the proximity to and accessibility of clients in the Norwegian capital.

Furthermore, other relevant details were revealed by Isaksen (2004). More than half of the firms’ employees work directly in the offices of clients for a long period, and 80% of the software firms offering tailor-made solutions hold regular face-to-face meetings with clients. However, in 65–80% of the firms, most of the contact with their clients is based on phone calls and email exchanges after the contract has been signed. These figures suggest that computer-mediated technologies are important in favouring firm–client contact (Bathelt & Turi, 2011), even though the co-location of the two economic actors remains a crucial and probably more relevant factor.

All of these studies have analysed in depth the role of clients in knowledge exchange and learning competences in various geographical areas, often adopting a multi-scalar approach. However, the difficulties potentially encountered by software firms in finding new clients in more distant markets have not been tackled adequately. This is a critical factor for software firms in general and especially for small and medium enterprises (SMEs) and micro-firms located in peripheral and marginally innovative regions. To the best of our knowledge, no studies in economic geography and related fields have analysed this topic extensively so far. This topic has been tackled especially in other disciplines, such as economics, management and marketing—essentially adopting a national perspective—by analysing specifically the difficulties encountered by firms in entering a new market (e.g. Chetty & Holm, 2000; Huang, 2007; Ojala, 2009; Pedersen & Petersen, 2004). The present paper aims to narrow the gap in the economic geography literature by examining—among other things—the impact of geographical distance on business linkages for software firms located in a peripheral and marginally innovative area, such as the province of Lecce in southeastern Italy.

### **3. ICT firms and the socio-economic fabric of the province of Lecce: An overview**

#### **3.1. The ICT sectors and the software developers in the province of Lecce: An overview**

The high degree of process and product innovations in ICT necessitates a continuous redefinition of the borders and classification of the economic activities making up the sector. The increasing speed of the introduction of new products and the integration of technologies have accelerated the rhythm of obsolescence of the sector classification. The last classification of the ICT sector developed by the OECD (2006–2007)—based on the ISIC<sup>1</sup> Rev. 4—identified three distinct layers: (1) the ICT manufacturing industries, (2) the ICT trade industries and (3) the ICT service industries (Osservatorio Ict Calabria, 2013). The different sectors making up the ICT macro-sector are classified in Table 1 according to the three-digit NACE 2007 Rev. 2 classification (Eurostat, 2016, p. 5).

ICT is a very important sector in the Italian economic fabric (Assinform, 2015) and accounted for 101,955 companies and more than 585,000 employees at the national level in 2010 (Istat, 2011). With regard to the geographical distribution (see Tables 2 and 3), the north (especially the north-west) shows the largest concentration of companies and employees. In 2011, 50.4% of the Italian ICT firms were located in the northern regions (employing 57.3% of the overall workers in the sector) and 21.6% in the central regions (22.1% of the overall employed persons). The southern firms (including the ones located in the two major islands, Sicily and Sardinia) accounted for 28.0% of the

**Table 1. ICT Sector—NACE Rev. 2 Code (three digits)**

| NACE_2007_CODE                      | NACE_2007_DESCRIPTION  |
|-------------------------------------|--|
| <i>ICT manufacturing industries</i> |  |
| 261                                 | Manufacture of electronic components and electronic boards   |
| 262                                 | Manufacture of computers and peripheral equipment  |
| 263                                 | Manufacture of communication equipment   |
| 264                                 | Manufacture of consumer electronics  |
| 268                                 | Manufacture of magnetic and optical media  |
| <i>ICT trade industries</i>         |  |
| 465                                 | Wholesale of ICT equipment   |
| <i>ICT services industries</i>      |  |
| 582                                 | Publishing of software   |
| 611                                 | Wired telecommunications activities  |
| 612                                 | Wireless telecommunications activities   |
| 613                                 | Satellite telecommunications activities  |
| 619                                 | Other telecommunications activities  |
| 620                                 | Computer programming, consultancy and other information technology and computer service activities |
| 631                                 | Data processing, hosting and related activities, web portals                                       |
| 951                                 | Repair of computers and communication equipment  |

Source: Authors' own elaboration.

**Table 2. Geographical distribution of ICT firms in Italy (%)**

|           | ICT sector |       | Manufacturing industries |       | Trade industries |       | Service industries |       |
|-----------|------------|-------|--------------------------|-------|------------------|-------|--------------------|-------|
|           |            |       |                          |       |                  |       |                    |       |
| Northwest | 29.11      | 50.43 | 40.44                    | 67.57 | 33.34            | 54.20 | 35.39              | 56.57 |
| Northeast | 21.32      |       | 27.13                    |       | 20.86            |       | 21.18              |       |
| Centre    | 21.63      |       | 18.80                    |       | 19.47            |       | 23.47              |       |
| South     | 19.37      | 27.94 | 9.73                     | 13.63 | 18.78            | 26.33 | 13.53              | 19.95 |
| Islands   | 8.57       |       | 3.90                     |       | 7.56             |       | 6.42               |       |

Source: Authors' own elaboration of Census of Industry and Services data (Istat, 2011).

**Table 3. Geographical distribution of employees in Italy (ICT sector; %)**

|           | ICT sector |       | Manufacturing industries |       | Trade industries |       | Service industries |       |
|-----------|------------|-------|--------------------------|-------|------------------|-------|--------------------|-------|
|           |            |       |                          |       |                  |       |                    |       |
| Northwest | 33.78      | 57.30 | 55.05                    | 76.28 | 47.29            | 68.07 | 38.24              | 54.04 |
| Northeast | 23.53      |       | 21.23                    |       | 20.79            |       | 15.80              |       |
| Centre    | 22.05      |       | 15.32                    |       | 17.18            |       | 35.59              |       |
| South     | 14.45      | 20.64 | 7.57                     | 8.40  | 10.34            | 14.75 | 7.05               | 10.37 |
| Islands   | 6.19       |       | 0.83                     |       | 4.41             |       | 3.32               |       |

Source: Authors' own elaboration of Census of Industry and Services data (Istat, 2011).

overall ICT companies at the national level, even though they employed only 20.6% of the overall workers in the sector (Istat, 2011).

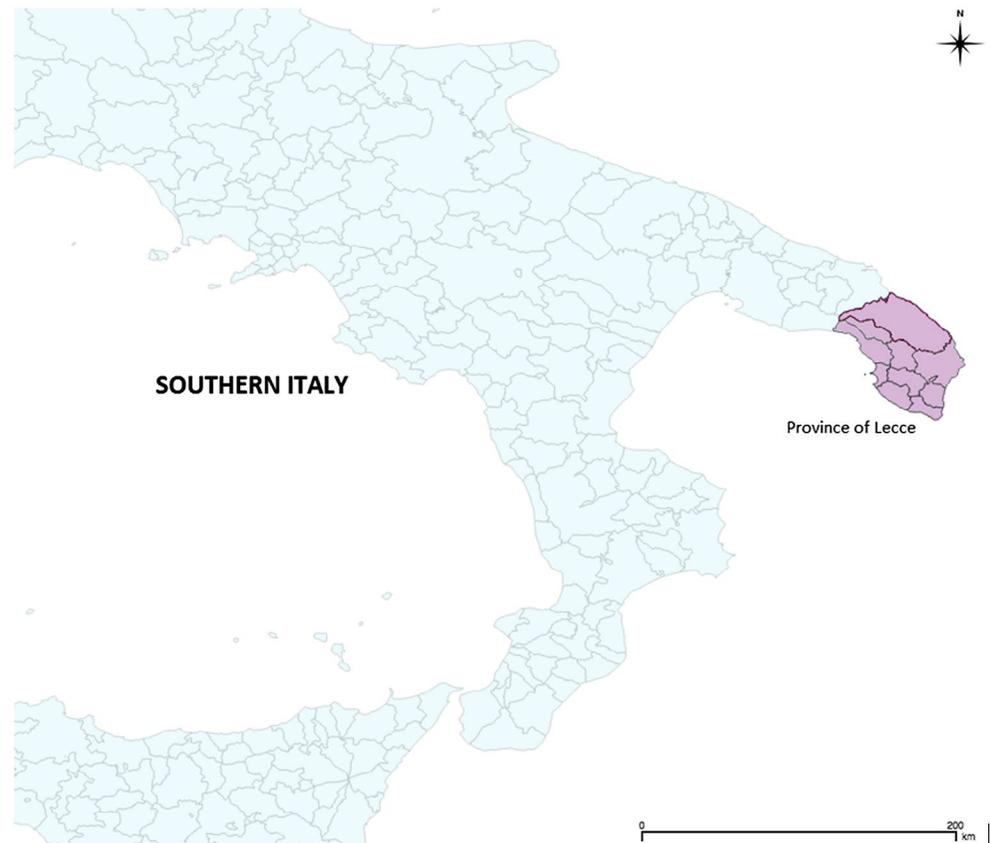
This marginal role of the ICT sector in the southern regions is even more accentuated in the province of Lecce (see Figure 1),<sup>2</sup> that is, the marginally innovative sub-region of Apulia—in southeastern Italy—to which our study refers (Istituto Guglielmo Tagliacarne, 2014; Svimez, 2015). This regional area is characterised by a low degree of urbanisation, although Lecce is one of the most populated provinces in southern Italy, and by an economic fabric that is traditionally based on agriculture, craft and commercial activities. Furthermore, the economic production system is mainly based on micro (<10 employees) and small (<50 employees) enterprises (Istat, 2011). The tourism industry is also considered as a relevant asset for the province (Ufficio Di Statistica Della Provincia Di Lecce, 2015).

According to the official data provided by the Italian Census of Industry and Services (Istat, 2011), the ICT sector in the province of Lecce accounts for only 761 firms and 1,854 employees, exerting a very low impact on the overall number of firms and employees at the provincial level (1.4% for both). Furthermore, the ICT companies and employees located in the province of Lecce correspond to only 0.8% of the total firms and 0.3% of the overall employed persons at the national level.

The “ICT service industry” subsector plays the major role within the ICT asset in the province of Lecce. The employees in this layer account for 83.4% of the total employees in the ICT sector at the provincial level (82.1% of the overall firms), whereas the figures related to the other two layers reveal their very marginal contribution in terms of firms and employed persons (i.e. 13.9% of employees and 15% of firms in the “ICT trade industries” and 2.7% of employees and 2.9% of firms in the “ICT manufacturing industries”; see Figure 2).

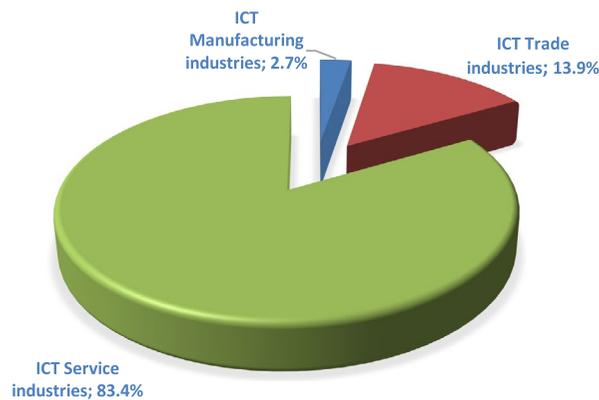
**Figure 1. Location of the province of Lecce (Map).**

Source: Authors' own elaboration.



**Figure 2. Employed persons in the ICT sector layers (%) in the province of Lecce.**

Source: Authors' own elaboration of Census of Industry and Services data (Istat, 2011).



The location quotients (LQs) that we adopted to measure the sectorial specialisation in the province revealed that only the labour market area (LMA) of Lecce (i.e. the provincial capital) shows a value of the index above 1—implying specialisation in the field—both in the sector as a whole and with regard to the ICT service industry subsector, while no specialisation was found in the other provincial LMAs (i.e. values of LQs less than 1).

#### 4. Methodology

Ten face-to-face or telephone interviews with founders, owners, associates, commercial managers and software developers of software firms located in the province of Lecce were conducted between February and May 2015. Specifically, a qualitative method based on a structured questionnaire and in-depth interviews was adopted to carry out the study. In addition, quantitative data related to the interviewees' responses were displayed in various tables (see Section 5). Although a real quantitative analysis was not conducted in this study, such figures enabled us to summarize numerically the major results of the study with the objective of providing the readers with a clear picture of the most important partners, geography and sources of innovation and so on according to the responses of the surveyed firms.

The structured questionnaire included questions regarding general information about each firm and informant (i.e. name of the firm, name and position of the respondent, year of establishment of the firm, number of employees and ICT sub-sector) together with seven specific questions on the following:

- (1) the typology of the most important partners in terms of knowledge exchange and learning competences (i.e. clients, competitors, universities and research centres, suppliers and R&D partners) and their location (i.e. the same province, same region, other Italian regions, Europe or rest of the world);
- (2) the effects of such knowledge exchange and acquired competences at the firm level (i.e. opening up of new technical fields, solution of specific problems, R&D inputs, broader relational networks and new ideas);
- (3) the channels primarily used to exchange knowledge (i.e. contracts without research content, research contracts, R&D collaborations, joint research projects and programmes, licensing, consultancies, co-publications, informal contacts and participation in meetings, congresses, conferences or fairs; see Trippi et al., 2009);
- (4) the percentage of ties with current partners based on knowledge exchange established in the last six years (or, in the case of younger firms, since the beginning of the entrepreneurial activity);
- (5) the percentage of new ties established in the last three years (or, in the case of younger firms, starting from the second half of the entrepreneurial activity; e.g. the last two and a half years in the case of firms founded five years earlier);

- (6) the percentage of public and private clients;
- (7) the major sectors in which the clients operate and their location (i.e. the same province, same region, other Italian regions, Europe or rest of the world).

At the same time, the in-depth interviews (i.e. based on a set of predetermined open questions) focused on various topics, including the potential drawbacks related to starting a new business and operating in a peripheral area and the motivations determining the decision to locate the headquarters of firms in the province of Lecce. Furthermore, the role of clients as well as the relevance of the dimension and reputation of firms in terms of knowledge exchange and market dynamics were also examined by means of two specific questions.

The snowball sampling technique was adopted to select firms. This choice is primarily justified by the features of ICT in the province of Lecce, which is still a marginal economic sector mainly characterised by very young companies. Snowball sampling is a technique in which future interviewees are selected based on their acquaintance with previously interviewed respondents (Vogt, 1999). Thus, the sample group grows like a rolling snowball. Specifically, the interviewees were selected in the following way: the first interview was conducted with the founder and owner of a software firm with whom the authors of the present paper were personally acquainted. At the end of the first and each following interview, the respondents were asked to indicate a list of potential further interviewees. The adoption of the snowball sampling technique and criteria such as the dimension and year of establishment enabled us to select a well-balanced number of firms reflecting the characteristics of the sector in the province of Lecce.

Following Baker and Edwards (2012), the interviews were concluded when the saturation point was reached, that is, when no new significant information was provided by the answers of the new respondents. To be more precise, the eighth interview was considered to be the saturation point in our case study.

## **5. Geography of knowledge and market dynamics: the case study of the ICT firms in the province of Lecce**

In this section data analysis and methods of descriptive statistics are applied to summarize the major results of the study with the aim of providing a comprehensive picture of the research results.

### ***5.1. Some preliminary findings from the questionnaire: the characteristics of the firms, knowledge exchange and the role of clients***

According to Table 4, most of the interviewees own or work for micro firms or SMEs, although in two cases one manager and one software developer of two larger companies were interviewed (i.e. employing respectively 60 and 100 persons). As specified in the previous section, the criteria according to which these software firms were selected were their number of employees and year of establishment. The aim of this selection was to reflect the characteristics of the firms operating in the sector at the provincial level (i.e. primarily young micro firms and SMEs) as well as to provide some insights into the dynamics related to larger companies. All the surveyed companies were founded during the period 2004–2013.

According to the NACE Rev. 2 classification, the firms making up our sample are involved in several activities and especially in the creation of web portals (18.2%), computer facilities and management activities (12.7%), computer consultancy activities (12.7%) and computer programming activities (10.9%). Furthermore, 14.6% of the surveyed companies are involved in a general sub-sector labelled “other computer technology and computer service activities” (for a detailed overview of the sub-sectors involving the firms included in the present case study, see Figure 3).

**Table 4. List of interviewees, location, dimension and year of establishment of software firms**

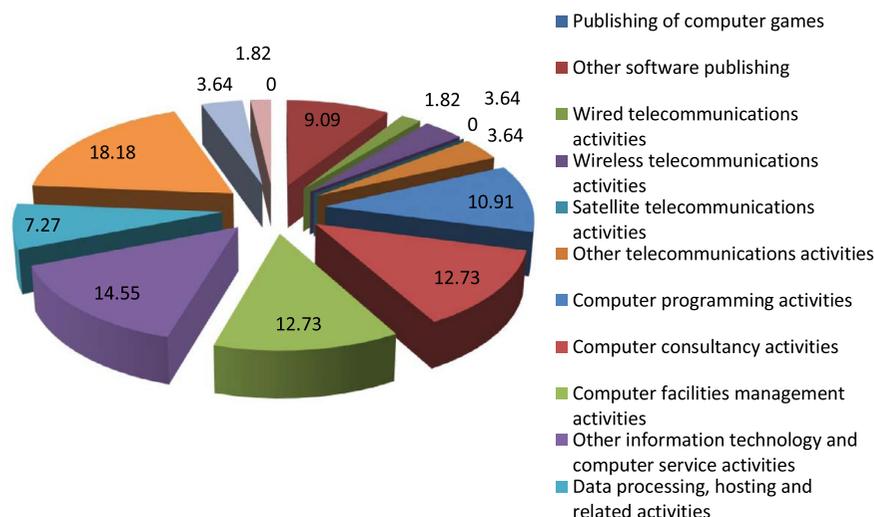
| Company | City      | Interviewee           | Year of establishment | Employees         |
|---------|-----------|-----------------------|-----------------------|-------------------|
| 1       | Corsano   | Founder and owner     | 2012                  | 5                 |
| 2       | Lecce     | Web developer         | 2010                  | 12                |
| 3       | Lecce     | Associate             | 2013                  | 2                 |
| 4       | Salve     | Owner                 | 2013                  | 1                 |
| 5       | Maglie    | Founder and associate | 2012                  | 3                 |
| 6       | Cavallino | Manager               | 2004                  | 60                |
| 7       | Lecce     | President             | 2005                  | 4                 |
| 8       | Lecce     | Software developer    | 2008                  | 100 (20 in Milan) |
| 9       | Sternatia | Associate             | 2009                  | 2                 |
| 10      | Lecce     | Commercial manager    | 2010                  | 16                |

The figures displayed in Table 5 show that clients were considered to be the most important partners in terms of knowledge exchange and learning competences by the software firms located in the province of Lecce (15 mentions), followed by suppliers (9), competitors (7) and research establishments (i.e. universities, polytechnics and research centres, 7). At the same time, the respondents were asked to indicate where these partners are located. Their responses reveal that they are primarily located at the national level (16 mentions), although the contribution of the provincial partners was also considered to be—almost equally—significant (15).

The next table shows in detail the effects of the relationships established by the software firms located in the province of Lecce with their partners (Table 6). Our findings confirm the extreme relevance of clients—in absolute terms and when compared with the other economic actors (39 mentions)—to several aspects related to the firms’ activities, such as the opportunity to foster broader relational networks (10 mentions), finding solutions to specific problems (9) and bringing in fresh ideas (8) during and after the execution of the commissioned work. Apart from clients, it must be highlighted that competitors (22 mentions) contribute significantly to the knowledge exchange and learning competence dynamics (i.e. opening up of new technical fields, solution of specific problems, R&D inputs, broadening of relational networks and introduction of new ideas in the firm). Finally, suppliers (19 mentions) were considered to be especially important in the solution of specific technical and development problems (6).

**Figure 3. Share of employees in the surveyed ICT firms.**

Source: Authors’ own elaboration from the questionnaire.



**Table 5. Most important partners in terms of knowledge exchange/learning competences and their location**

|   | Province | Region | Italy | Europe | Rest of the world | Frequency |
|---|----------|--------|-------|--------|-------------------|-----------|
| Competitor                                      | 2        | 1      | 3     | 1      | –                 | 7         |
| Clients   | 6        | 3      | 4     | 1      | 1                 | 15        |
| Universities, polytechnics and research centres | 2        | 3      | 2     | –      | –                 | 7         |
| Suppliers                                       | 1        | –      | 5     | 3      | –                 | 9         |
| R&D partners                                    | 2        | 1      | –     | –      | –                 | 3         |
| Technology transfer offices                     | –        | 1      | –     | –      | –                 | 1         |
| Associations                                    | 2        | 1      | 2     | –      | –                 | 5         |
| Frequency                                       | 15       | 10     | 16    | 5      | 1                 |           |

Notes: Number of mentions. The questionnaire allowed for multiple answers. Most frequently mentioned specific field in the questionnaire are in bold.

Source: Authors' own elaboration from the questionnaire.

**Table 6. Most important partners and the effects of knowledge exchange and learning competences**

|                                   | New technical fields | Solution of specific problems | R&D inputs | Broader relational networks | New ideas for the firms | Faster production processes | Frequency |
|-----------------------------------|----------------------|-------------------------------|------------|-----------------------------|-------------------------|-----------------------------|-----------|
| Competitors                       | 5                    | 4                             | 4          | 5                           | 4                       | –                           | 22        |
| Clients                           | 6                    | 9                             | 6          | 10                          | 8                       | –                           | 39        |
| Universities and research centres | 3                    | 1                             | 3          | 3                           | 2                       | –                           | 12        |
| Suppliers                         | 4                    | 6                             | 3          | 2                           | 3                       | 1                           | 19        |
| R&D partners                      | 2                    | 2                             | 3          | 2                           | 2                       | –                           | 11        |
| Technology transfer offices       | 1                    | –                             | 1          | 1                           | –                       | –                           | 3         |
| Associations                      | –                    | 1                             | 1          | 4                           | 1                       | –                           | 7         |
| Frequency                         | 21                   | 23                            | 21         | 27                          | 20                      | 1                           |           |

Notes: Number of mentions. The questionnaire allowed for multiple answers. Most frequently mentioned specific field in the questionnaire are in bold.

Source: Authors' own elaboration from the questionnaire.

A specific question was phrased to assess the channels mainly used by the software firms making up our sample to exchange knowledge. The figures displayed in Table 7 reveal that informal contacts (13 mentions) and consultancy (11 mentions) are considered to be two very relevant knowledge exchange channels, followed by contracts without research content (8). Furthermore, most of these significant relationships have involved local software firms and partners located at the national level (24 mentions), whereas partners located in the same province (17) or region (14) received fewer mentions.

All these figures preliminarily demonstrate that especially relationships based on informal contacts, consultancy and—to a lesser extent—contracts without research content with clients located both at the provincial and at the national level characterise the knowledge exchange and learning competence dynamics of software firms located in a peripheral and marginally innovative area, such as the province of Lecce.

**Table 7. Channels and geography of knowledge channels**

|  | Province | Region | Italy | Europe | Rest of the world | Frequency |
|--|----------|--------|-------|--------|-------------------|-----------|
| Contracts without research content       | 3        | –      | 5     | –      | –                 | 8         |
| Research contracts                       | 1        | 1      |       | –      | –                 | 2         |
| R&D collaborations                       | 2        | 2      | 2     | 1      | –                 | 7         |
| Joint research projects and programmes   | 2        | 2      | 2     | –      | –                 | 6         |
| Consortia                                | –        | 1      | –     | –      | –                 | 1         |
| Licensing                                | 1        | –      | –     | –      | –                 | 1         |
| Consultancy                              | 2        | 2      | 6     | 1      | –                 | 11        |
| Co-publications                          | –        | 1      | 1     | –      | –                 | 2         |
| Meetings, congresses, conferences, fairs | 1        | 1      | 3     | –      | –                 | 5         |
| Informal contacts                        | 5        | 3      | 5     | –      | –                 | 13        |
| Frequency                                | 17       | 13     | 24    | 2      | 0                 |           |

Notes: Number of mentions. The questionnaire allowed for multiple answers. Most frequently mentioned specific field in the questionnaire are in bold.

Source: Authors' own elaboration from the questionnaire.

Finally, the other questions submitted to the respondents, aiming to evaluate the balance between new and repeated ties as well as the sectors in which clients are primarily involved (public or private, by also distinguishing the exact industries within the private sector), revealed further interesting findings.

Specifically, the figures related to new and repeated ties show a well-balanced share of connections established both in the last 6 years (i.e. ranging between 21 and 40% for 4 respondents and between 61 and 80% for another 4 respondents) and in the last 3 years (i.e. 41–60% for 6 respondents). These findings reveal both strong ties based on long-time connections and new knowledge introduced into the firm by means of new relationships. Furthermore, clients operating in the tourism sector—one of the major industries in the area under analysis (Ufficio Di Statistica Della Provincia Di Lecce, 2015)—are the main partners among those located in the same province (4 out of 7 mentions). Conversely, several different sectors were considered to be relevant at the national level (i.e. automotive in two cases and industries such as health, betting, informatics, communication and technology in one case). Finally, clients operating in the private sector are preponderant in knowledge exchange and learning competence dynamics (7 out of 10 mentions).

## 6. Findings from the in-depth interviews

In the next sub-sections, some specific aspects are examined further by means of in-depth interviews. Specifically, the role played by clients in knowledge exchange and learning competence dynamics (Section 6.1), the decision to found a new company in a peripheral and marginally innovative area and the related difficulties deriving from operating in a weak socio-economic context (Section 6.2) are analysed.

### 6.1. The role of clients in knowledge exchange dynamics

As shown in Section 5.1, clients located at the provincial and national levels are undoubtedly the most important actors in terms of knowledge exchange for software firms located in the province of Lecce. Specifically, clients are considered to be economic actors who are able to provide more inputs than others in the solution of technical or procedural problems throughout the software development process.

According to one software developer from a medium-sized firm located in Lecce (i.e. the provincial capital), this happens thanks to the specific needs of clients enabling firms to improve significantly the quality of the products and services that they provide:

We receive a countless number of inputs from our clients. For instance, we acquire specific knowledge in the various sectors enabling us to manage the various commissions we receive from several types of clients operating in different industries. Therefore, our clients transfer to us [i.e. software developers, authors' note] their knowledge in their specific field or sector. This aspect is particularly relevant in the execution of our tasks. (Software developer, Firm 8)

All the other respondents reinforced this concept by stressing that clients help to “solve specific problems” (Software developer, Firm 8), provide “inputs for the solution of specific problems” (Associate, Firm 9), push software firms to “find each time new solutions based on their specific needs” and offer them “several insights [...], also in terms of research, thanks to the specific interventions carried out” (Associate, Firm 3).

However, clients are not only considered to be relevant partners in the solution of specific technical problems. As already suggested by one of the interviewees (i.e. Associate, Firm 3), their contribution to knowledge exchange dynamics—leading to new ideas and consequent innovation—is broader and much more significant. In fact, ties established with clients enable local firms to “open up to new sectors and develop new ideas often becoming a new business” (President, Firm 7).

For this reason, clients are considered to be a very relevant source of innovation by the software firms making up our sample. According to one respondent, “clients have brought new ideas, projects and development fields” to his firm by means of a “constant dialogue” (Founder and owner, Firm 1). The effects of this “dialogue” (or exchange) are considerable and enable firms to “understand the new directions of the ICT sector especially in some industries—such as the tourism industry—which are more sensitive to the information technology platforms” (Commercial manager, Firm 10). At the same time, clients are able to “indicate and design the future lines of action” of the software firms based on the analysis of their needs (Manager, Firm 6).

All these mechanisms are not automatic but based on long-term relationships, larger projects and mutual trust. Accordingly, time is a fundamental factor in the knowledge exchange dynamics created by the software firms located in a peripheral and marginally innovative area: “the more time you spend with a client, the higher is mutual trust and the faster is communication” (Founder and owner, Firm 1).

## **6.2. Operating in a peripheral area**

Although purely economic factors, such as the cost of living and personnel costs, are important in the decision to establish a new business in the province of Lecce (Founder and owner, Firm 1; Software developer, Firm 8), other personal motivations are considered to be the actual major reasons pushing the local entrepreneurs to start their business and keep operating in a peripheral area.

In most cases, the location of firms is simply determined by the opportunity to work in or not far from the entrepreneurs' hometown, without any other specific reason. However, this decision led to further implications enabling local entrepreneurs to “acquire a portfolio of local clients deriving from a previous entrepreneurial experience” (Associate, Firm 3) or “take advantage from the relational network developed throughout the years” (Owner, Firm 4).

On the other hand, a few respondents stressed that different motivations caused them to start a new business in the province of Lecce. Specifically, their entrepreneurial activity was inspired especially by the will to “challenge the market from a peripheral area” (Associate, Firm 9) and “create an important entity in the province despite the opportunity to obtain a more substantial public-private funding in a different region” (Web developer, Firm 2).

Operating in a peripheral area and working with clients located in other regions are not considered to be drawbacks from the technical–infrastructural viewpoint by virtue of the nature of the technology used and the objectives of the relationships (i.e. Software development). These elements were confirmed by several respondents, according to whom operating in a peripheral area “is not a problem at all” (President, Firm 7) and “does not represent a problem from the technical viewpoint” (Web developer, Firm 2), especially when “clients have some expertise in information technology” (Software developer, Firm 8), “does not create any problems, limitations or restrictions” (Founder and owner, Firm 1) and “is facilitated by the intangible infrastructures” (Founder and associate, Firm 5) on which their work relationships are based.

However, two major disadvantages related to the location of firms were identified by the interviewees: first, the lack of an adequate demand in the provincial area and, second, the geographical distance from the core, more receptive and broader markets. With regard to the first point, one of the interviewees stressed:

The peripheral location of our firm is a drawback. The clients located in the province of Lecce do not seem to be particularly interested in the opportunities offered by the information technology and do not respond adequately to the incentives of the new technologies. (Associate, Firm 3)

This lack of demand for ICT services at the local level encourages entrepreneurs to try to expand their entrepreneurial activities into new and more distant areas. However, in this case as well, the peripheral location of their firms represents a serious limitation for the entrepreneurs located in the province of Lecce. According to one informant:

From the business viewpoint, our distance from the [Italian, authors' note] northern regions is a problem. My colleague and I have to travel very often since we do not have very important clients in our region. The direct contact with clients before signing a contract remains a fundamental aspect. This frequent travel entails also a relevant cost for our company. [...] It is extremely difficult to find important clients in southern Italy, especially because in the northern regions there is more awareness about the opportunities offered by the information technology to enhance business turnover. (Software developer, Firm 8)

Therefore, personal and face-to-face contact is considered to be a vital element of the creation of sound relationships based on mutual trust. This aspect led the larger firms to establish new branches in the economically stronger, more dynamic and more competitive urban areas of the country (e.g. Milan and Rome). Similarly, in one case the owner of an SME had to hire one employee working from home in Milan, since most of his major clients are located in the regional capital of Lombardy in northern Italy (Web Developer, Firm 2).

Finally, another interviewee stressed that “it is very difficult to find new clients without a headquarters or a branch in the same place where they are located. This depends on the lack of a relational network and on the reputation of the ICT firms located in our province [which are not considered to be on the same level as the firms located in other regions, authors' note]. In any case, also long-distance agreements are always based on personal acquaintance and mutual trust” (commercial manager, Firm 10).

## 7. Discussion and conclusions

The aim of this paper was to determine the role of clients in knowledge exchange and market dynamics for software firms located in a peripheral and marginally innovative regional area. At the same time, the difficulties that those firms encounter in their activity due to their peripheral location and other related research questions (i.e. the motivations pushing entrepreneurs to found their firm in a peripheral area, the role of direct personal contact and the relevance of firms' reputation in market dynamics) were tackled.

One structured questionnaire was administered and in-depth interviews were carried out with ten founders, owners or employees of software firms located in the province of Lecce, a lagging sub-regional area of Apulia in southeastern Italy. Although the future development of the present study probably should rely on a broader data-set and include additional quantitative analyses to identify the other factors that potentially determine the possibility to reach distant clients as well as economic performance (e.g. firms' absorptive capacity, dimensions of proximity not included in this analysis, knowledge bases, agglomeration economies; see e.g. Asheim & Gertler, 2005; Boschma, 2005; Tripl et al., 2009; van Oort & Atzema, 2004), we believe that our case study—embedded in a broader theoretical framework—achieved several interesting results.

First, in most cases very simple motivations, such as the place of birth or the opportunity to work in or not far from the hometown, determined the decision to found a new company in a peripheral area. The positive side of this decision is that local entrepreneurs often inherit a portfolio of local clients deriving from previous work experience and take advantage of pre-existing relational networks.

Furthermore, the results of the interviews clearly confirm the findings of many previous studies highlighting the key role played by clients in knowledge exchange and learning competences (e.g. Isaksen, 2004, 2006; Segelod & Jordan, 2004; Tripl et al., 2009). These findings are interestingly related to the second major aspect that we tackled in this paper (i.e. market dynamics). Bathelt and Turi (2011) stressed that face-to-face interactions and computer-mediated communications are both important channels through which to exchange knowledge and access new markets, depending on the geographical and economic scenarios in which firms operate. In many cases, a combination of the two channels based on temporary face-to-face and virtual computer-mediated communications is beneficial (Bathelt & Turi, 2011; Torre, 2008).

The owners and employees of firms located in the province of Lecce argued that working with clients located in distant geographical areas is not a problem from the technical–infrastructural viewpoint. These long-distance information flows and operations are facilitated by the technology that they mainly use in the software development process (i.e. the Internet). However, their peripheral location motivates them to search for clients located outside the local and regional areas. Clients at the national level are considered to be one of the most important sources of knowledge in absolute terms, since they enable software firms especially to foster broader relational networks, find solutions to specific technical and conceptual problems or bring new ideas into the companies.

Tripl et al. (2009) argued that agglomeration is not a key factor for software firms due to their heterogeneous orientation. Conversely, Isaksen (2004) suggested that the software sector is influenced by demand-side factors and benefits from the proximity to and accessibility of clients in core areas. Our study supports Isaksen's findings, since software firms located in a peripheral and marginally innovative area, such as the province of Lecce, face severe difficulties in drafting contracts with clients located in distant regions. In this respect, one critical and very negative factor is the lack of face-to-face contacts.

Accordingly, the southeastern Italian firms that we surveyed have to adopt specific strategies to reach distant clients located in the core areas of the country because of a lacking demand for software services at the regional level. These strategies are determined by the diverse economic resources of each firm and include the opening of a branch, the hiring of new employees working from home or frequent business trips to the Italian cities where the major clients are located.

One of the most important informational functions of face-to-face interactions is to engender trust between partners (e.g. Porter, 1998). Accordingly, gaining the trust of distant potential clients is actually one of the main drawbacks identified by our respondents in southeastern Italy regarding market dynamics. Computer-mediated communication enables them to acquire and use significant knowledge from clients located in distant regions, even though it is very difficult to draft contracts with potential distant partners without previous acquaintance fostering trust between the two parties involved.

According to Bathelt and Turi (2011, p. 521), emblematic gestures are used instead of words in face-to-face interactions: “for instance, a head shake signifying ‘no’”. What our study adds to this assertion is that working satisfactorily with distant partners is possible thanks to the “virtual buzz” generated by computer-mediated communications, but it is a fairly rare event in the absence of previous acquaintance, face-to-face meetings and a firm handshake.

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#### Notes

1. The International Standard Industrial Classification (ISIC) is a United Nations system used to classify economic data.
2. The province of Lecce corresponds to NUTS3 according to the “Nomenclature of territorial units for statistics” (NUTS) (Eurostat classification).

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