Characterisation of knowledge-based networking strategies: insights from the KIBS sector

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Abstract: In the current economy, individual firms cannot possess all the knowledge that is necessary to compete. Hence, networking relationships become an important way through which firms can develop their potential by accessing to resources of other players. However, the networking strategies that companies implement can vary depending on the nature of their competitive conditions and on their specific goals. The paper analyses this topic in the case of a particular knowledge-intensive business service industry, investigating the relationship between knowledge strategies and networking strategies pursued by companies. By developing and combining classifications previously proposed in the literature, the study examines the ways companies set their networking strategies based on their capability and necessity to share knowledge with specific business partners (clients, suppliers, service providers, etc.).

Keywords: KIBS; inter-company networking; networking strategy; knowledge strategy; multiple case-studies.


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1 Introduction

In the current knowledge-based economy, it is hard or even impossible for individual firms to possess and manage all the knowledge they need to compete (Bolisani and Scarso, 2000; Quintas et al., 1997). This is particularly true for small companies that are mostly dependent on external resources (Siikonen et al., 2011). That’s why resorting to networking relationships is becoming a common practice, as it allows firms to access knowledge of other players that complete their internal competencies (Håkansson and Ford, 2002; Zeng et al., 2009). However, networking strategies can vary depending on firms’ competitive conditions, their knowledge base, and their specific business goals. The paper analyses this issue, by focusing on the relationship between knowledge strategies and networking strategies. This topic has been overlooked by the literature so far. More precisely, while the two issues (i.e., knowledge strategies and networking strategies) have been broadly investigated separately, their linkage and reciprocal influence have been little considered. By developing and combining existing classifications, this study aims to investigate the way companies set their networking strategies in connection to their core capabilities, market targets, and needs to share knowledge with business partners (clients, suppliers, service providers, etc.). Our hypothesis is that firms with different knowledge strategies adopt and implement different networking strategies.

To explore this relationship, a multiple case-study research in a specific knowledge-intensive business service (KIBS) sector, i.e., enterprise resource planning (ERP) software producers in Northern Italy was conducted. Seven companies were analysed and categorised in terms of their knowledge and networking strategy. The paper is organised as follows: in the next section, a theoretical introduction to the relation
among knowledge and networking strategies is given; Section 3 describes the methodological approach adopted in the study, while in Section 4 the case studies are illustrated. Section 5 summarises and discusses the results, while the final section adds conclusions and limitations of the study.

2 Knowledge strategies and networking strategies

The introduction of the concept of ‘knowledge strategy’ is relatively recent, and there is no clear agreement on it (Denford and Chan, 2011; Donate and Canales, 2012). In a broad sense, it can be referred to as the general guidelines that shape an organisation’s manipulation of its cognitive resources (Kasten, 2007). In practical terms, the notion can be associated to the plans of an organisation for making the best use of its knowledge assets for competitive advantage (Holsapple and Jones, 2006; Zack, 1999).

According to Von Krogh et al. (2001), a knowledge strategy can be explicitly conceptualised as the set of choices and plans that regard the firm’s knowledge base and affect its competitive advantage (Bierly and Chakrabarti, 1996).

Some authors identify a knowledge strategy as a knowledge management (KM) strategy that is the attempt to formulate intentional plans for explicitly managing knowledge (Sveiby, 2001; Wenger, 2004). However, a KM strategy mainly deals with specific organisational, managerial and technical issues that a company adopts for its KM programmes, while a knowledge strategy deals with business outcomes and support for competitive advantage (Denford and Chan, 2011). In other words, the notion of knowledge strategy is appropriate also for companies that do not have a deliberate KM programme but found their business on an intense use of knowledge.

Especially, this is the case of KIBS firms (Muller and Doloreux, 2009; Strambach, 2008). The term KIBS was introduced by Miles and colleagues in 1995 to denote private companies whose job consists of collecting, generating, analysing, and distributing knowledge with the aim to provide solutions to problems that their client firms cannot or do not want to treat on their own. These companies are commonly deemed to be characterised by the fact that their main production factor and outcome consist of knowledge, embedded in the artefacts or services they deliver. Hence, even when they do not implement intentional KM plans, they exploit their knowledge base as an explicit or implicit strategic ingredient for achieving their economic results. KIBS firms are also marked by intense knowledge flows with external partners (Landry et al., 2012), so they seem particularly suited for the scope of our analysis.

Some studies have attempted to identify and classify the different knowledge strategies that companies can pursue: as well summarised by Donate and Canales (2012), this literature has mainly developed taxonomies by considering specific dimensions of knowledge and/or knowledge processes. Although scholars agree that there should be a connection between business and knowledge, and between business strategy and knowledge strategy, a consensus on the business dimensions that denote a knowledge strategy is still missing.

With this purpose, we propose a classification that capitalises on the well-known Ansoff’s (1957) product/market strategic matrix and subsequent re-interpretations (Landoni et al., 2008; Von Krogh et al., 2001). This approach presents three advantages:
it refers to a well-established taxonomy
b it uses common and easy-to-use concepts and terms
c it links the notion of knowledge strategy with the main features of business.

The knowledge strategy matrix we propose here classifies different knowledge strategies on the base of the dimensions of technological knowledge and applicative knowledge (Scarso and Bolisani, 2010). The first dimension (technological knowledge) refers to the technical specialisation of the company, i.e., the kind of technology employed to deliver its products or services. In the matrix, a distinction is made between ‘existing technological knowledge’ (i.e., established pool of knowledge in the current technological domain) and ‘new technological knowledge’ (namely, knowledge about different technological systems). The second dimension (applicative knowledge) takes into account the market perspective, i.e., the customer’s needs that the product or service is designed to meet. ‘Existing applicative knowledge’ refers to knowledge of current business applications or markets, and ‘new applicative knowledge’ refers to novel application fields. The combination of these dimensions results in a typology of four distinct knowledge strategies (Figure 1):

- **Consolidation** strategy is oriented towards maintaining the boundaries of the current knowledge pool of a company. To be successful, this strategy requires that the possessed knowledge pool is continuously developed, updated and strengthened, in order to defend the current competitive position through the provision of continuously improved services.

- **Expansion** strategy consists of developing the pool of technological knowledge (for instance, in the case of ERP producers, by acquiring competencies on new technical platforms, programming languages, hardware systems, etc.) but remaining in the same applicative area. This strategy is generally pursued to meet specific needs of customers who, for instance, are interested in a new technological application that requires being adapted to the specific business environment.

- **Exploitation** strategy involves exploiting the ‘old’ knowledge pools to provide the same services in new business contexts. For instance, this can mean to adapt a vertical ERP system to another sector. In this case, the company has to improve and extend its knowledge of new needs, clients or markets which have not been considered yet.

- **Exploration** strategy means to radically modify the pool of knowledge currently possessed, with the purpose to explore new technologies or new market applications. This represents an effort to reach new frontiers that, in the future, might be the starting point of new consolidation strategies.

The first strategy (‘consolidation’) represents the most conservative/defensive approach. This may be appropriate in static conditions and implies lower risk at least in the short run; on the other hand, it can weaken the position of the company in highly dynamic environments that require flexibility and responsiveness. Conversely, the last strategy (‘exploration’) is very risky and involves a particular propensity to changes; however, if it turns out to be successful, this strategy can lead the company to reach a position of advantage in the future competition. The other two strategies can be seen as a balanced
effort to combine growth without being kept locked in a specific technological domain or without the risks of investing in completely new markets.

As stated in the introduction, the paper aims to explore the connection between the above mentioned knowledge strategies and the company’s networking strategy. In fact, the nodes of a network can represent distributed repositories of knowledge: by interacting with networked partners, a company can enable the acquisition, transfer, and creation of knowledge (Monge and Contractor, 2003; Phelps et al., 2012), business opportunities (Burt, 1992) and innovation (Yayavaram and Ahuja, 2008). The performance of a knowledge strategy may therefore be related to the degree of ‘network openness’ (Eisingerich et al., 2010), defined as a function of network membership diversity and the willingness to accept new members (Zaheer and George, 2004).

Figure 1 Knowledge strategy matrix

In light of this, our classification distinguishes between:

- **Open networking strategy**: it refers to companies that have frequent and intense interactions with external partners; these interactions represent the foundations of their business. An open networking strategy implies that a company is willing to share knowledge with partners (suppliers, customers, services providers, etc.), in an attempt to exploit competencies and acquire complementary skills developed elsewhere. This strategy typically characterises companies that cannot manage all the knowledge that is required for their business, or that cannot run the high risks to develop it internally.

- **Closed networking strategy**: it refers to companies that develop and exploit their internal competencies, and do not need or are not willing to share elements of knowledge with external partners.

In the case of open networks, a further subdivision is made according to the ‘direction’ (upstream or downstream) of the network relationships. Hence we define:

- **Networking strategy towards customers**: it refers to companies that interact and share knowledge especially with customers. In other words, it is mainly from customers that a company acquires useful elements of knowledge that allow it to develop the business.
• Networking strategy towards suppliers: this case is symmetrical to the previous one, and refers to companies that mainly share knowledge with suppliers. In other words, it is the knowledge acquired through interactions with (especially technology) suppliers that represent the primary basis of the business.

This allows us to identify four generic types of networking strategies, as follows: closed; open towards clients; open towards suppliers; and open (towards both directions). The assumption of this study is that each of these four knowledge strategies claims for specific network relationships with other organisations, depending on the way the company needs to strengthen or extend its knowledge base. To verify this, an investigation in a specific KIBS sector, i.e., ERP software producers in Northern Italy, was conducted. It will be described in the following section.

3 Research methodology

The methodology employed here concentrates both on exploration and theory building: in fact, this paper aims at exploring and developing a theoretical classification of knowledge and networking strategies implemented by firms. An investigation based on qualitative research is therefore particularly suitable in this case: the approach allows researchers to understand the context-specific features of the single cases (Bamberger, 2000), as well as to explore the behaviour of contemporary firms within their real-life environments (Yin, 2003). In addition, given the complexity of the phenomenon, the investigation called for a direct contact with the respondents, in order to provide a better understanding of the specific and variable circumstances that affect knowledge strategies implemented by computer service firms.

This is the reason why an interpretative multiple case-study analysis was conducted between the end of 2009 and the beginning of 2010, involving a restricted number of software producers selected among the most dynamic in the market (see Table 1 for a summary). The focus was on companies (at least partly) capable of producing and distributing proprietary software, based on existing technological bases. In total, seven companies were analysed and categorised in terms of their knowledge and networking strategy. This setting was chosen on conceptual grounds in order to maximise appropriateness rather than representativeness (Miles and Huberman, 1994).

<table>
<thead>
<tr>
<th>#</th>
<th>Products</th>
<th>Main markets</th>
<th>Size</th>
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<tr>
<td>A</td>
<td>Vertical ERP</td>
<td>Fashion and retailing</td>
<td>200</td>
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<tr>
<td>B</td>
<td>ERP, BI, web services</td>
<td>Machinery, food, fashion</td>
<td>280</td>
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<tr>
<td>C</td>
<td>ERP components</td>
<td>Public administration, professional services</td>
<td>2,300</td>
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<td>D</td>
<td>ERP</td>
<td>Manufacturers</td>
<td>250</td>
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<tr>
<td>E</td>
<td>Vertical ERP</td>
<td>Banking, insurance</td>
<td>650</td>
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<tr>
<td>F</td>
<td>ERP, web services</td>
<td>Machinery, distribution, fashion</td>
<td>90</td>
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<tr>
<td>G</td>
<td>ERP</td>
<td>Manufacturing</td>
<td>40</td>
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Note: Names are disguised for confidentiality reasons.
The investigation made use of multiple sources of information. General data on the firms were gathered from various documental sources (i.e., company literature, websites, and press). Primary information was collected through interviews to key knowledgeable informants (entrepreneurs and managers) directly involved in the strategy formulation and implementation processes. Semi-structured interviews were also conducted with key managers, especially in marketing and technical departments. The interviews lasted up to two hours each. To gather comparable information, a common checklist was employed in managing interviews.

The interviews focused on the following issues:

- general data and information on firm’s business strategies
- products/services supplied and their features
- sources of innovations and knowledge
- customers and their role in innovation processes
- mechanisms of knowledge exchange with innovation partners.

The next section reports basic information regarding the investigated firms, at the time of the interview; real company names are disguised for confidentiality reason. The other sections summarise and discuss the main empirical findings.

Before presenting the results, a clarification is needed. Companies may have different business areas, and can therefore follow different strategies at the same time (this is especially true in the case of the larger ones). This means that, in a company, there may be different business lines for which they adopt different strategies. However, in line with the objectives of the study, we decided to focus just on the meaningful and intentional strategies related to the firms’ major business areas, and to investigate how these strategies are underpinned in terms of networks activated.

4 Empirical evidence

In this section, the examined cases are briefly presented. The business strategy of each company is presented, together with details regarding its products, markets, and organisation. It is then explained the kind of knowledge that is assumed to be required for implementing that business strategy, the main sources that the company exploits for acquiring or developing that specific knowledge, and other details that help to understand the relationship of the company with these sources of knowledge. This information is helpful to classify company’s knowledge strategy and networking strategy, and to explain the relationship between them, as discussed in Section 5.

4.1 Company A

Company A started as an independent software house based in the Veneto region. The focus of Company A was and still is on the fashion business, where it has accumulated decades of knowledge and of market reputation. In this segment, it provides an integrated solution for fashion firms, a full package that aims to satisfy all the customers’ needs. The provision is supplemented by the sale of peripheral services of Change Management,
and Information systems outsourcing. Services are rendered by a team of 200 professionals that operate in the Fashion&Retail business in Italy.

In 1999, Company A was acquired by a multinational computer service company (a world leader in IT services, and provides consulting, system integration and IT outsourcing services). This company was interested in strengthening its position in Italy, and acquired several Italian IT companies including Company A. This multinational group has headquarters in USA and three major offices in Australia, Asia and Europe, and it has multiple specialisations. However, Company A, which has become the Italian branch of the group, still focalises on the Fashion&Retail industry thanks’ to its recognised expertise.

The market strategy of Company A consists of increasing market share both in Italy and abroad. The focus on the fashion industry has been a clear-cut strategic decision from the beginning, which is justified if we consider the features of the business. In fact, speed of change and flexibility are the basic characteristics of fashion industry, which makes it a particularly complex business. Therefore, specific software solutions, that can manage effectively critical business processes, are required in this business, and this allowed Company A to accumulate specific market experience and operational knowledge, that can hardly be copied or imitated by competitors.

In this process of progressive growth of operational knowledge and market reputation, a significant role has been played by the relations the firm has with some key clients. In particular, the development of Company A’s capability to serve the variegated and multifaceted needs of an increasing group of clients relies on a strict collaborative interaction with a few lead users, which has enabled the company to learn how to apply its expertise to this particular market.

One client has been particularly important. For this client, a leading Italian fashion group, Company A has developed a new version of ERP that is now the core product for the Fashion industry. The implementation of the system, never used before, was quite complex and involved the whole Information systems division of the client and 25 professionals from Company A, employed in on-site functional and technical analysis and helpdesk activities.

The importance for Company A of the experience done with that first client is also testified by a major organisational change that occurred in 2007: a new ‘South & Western Region’ Fashion business unit was created. This business unit covers Italy, France, Belgium, Luxembourg, Spain and Portugal, its headquarters are in Italy, and can now count on the experience made with 200 international installations in well known Fashion companies. In Italy this represents a market share of 60% of Italian fashion companies.

4.2 Company B

Company B is a medium-sized software company, based in the Veneto region but with other 4 headquarters in Italy, which were established for extending the market coverage.

Founded in 1984, now it employs 280 people, 70 of which in the R&D department, and operates in different sector: mechanics and machinery (the original core segment) and, more recently, food, fashion, and retail. Customers (over 2,000 companies) are very different from one another, in terms of industry of operations, geographic localisation (all Italy is covered), and size (both very small and larger companies, including some multinationals, are served). The growth of the market has led the company to extend the coverage of its supply.
Its core product is a proprietary ERP solution that is, actually, the evolution of an RPG-based software focused on IBM’s ‘System i’ hardware, having the firm (and its founders) a long tradition and experience of such technology. For this, the firm has exploited a tight relation with IBM Rochester’s and Toronto’s Development Centers, which was crucial in order to have a guide in facing the future evolution of technologies. In short, it can be said that the company’s growth bases on two different but integrated approaches: firstly, the exploration of new markets and supply opportunities; secondly, the acquisition of new technical knowledge regarding new products and systems.

On the one hand, the improvement of the product and its adaptation to new target markets has required collaborative interactions. For instance, in order to extend its market opportunities and acquire new customers for its ERP system, the company has progressively developed other software components and technologies. This has implied the need to improve its pool of technical and applicative knowledge, also by interacting with external partners.

On the other hand, a first important new business area is that of product configurators, a significant extension of the ERP system for companies that produce modular devices (such as machinery). For this, a partnership with the local University has proven to be crucial.

In addition, following the market needs and the suggestions coming from sales and marketing departments, the company has started to resell other business applications. Particularly, this is the case of Business Intelligence (BI) applications. This business represents another natural extension of the ERP system, but its development requires completely new competencies both in technology and marketing. In order to improve the technical knowledge of the new area represented by BI, the company has exploited collaborations with key providers such as Qliktech. At the same time, the experience with any new client represents an opportunity to learn novel uses and applications that can later be offered to other customers.

A third emerging business for Company B is that of web marketing applications, which can be especially important for B2C companies. Here, the company has activated collaboration with the Polytechnic of Milan, with the purpose to enhance the technical knowledge which is required for the development of these applications.

In short, in terms of external networking, the company exploits collaborations in different directions: with old and new clients, with technology suppliers, and with research centres and university departments.

4.3 Company C

Company C is a large group that operates both in the domestic and international markets. Based in Lombardy, it has more than 2,300 employees and 1,200 distributors in Italy, Europe and the USA. Customers are more than 87,000, with 450,000 applications installed. The supply is very wide and encompasses specific software packages for business professionals, lawyers and public administrations, human resource management solutions, business software packages (ERP systems, business intelligence, business process management, and document management systems), security and automation.

From the strategic point of view, the firm acknowledges that, in the last period, the computer services business has been involved in some important changes. The spread of Internet-based applications and open source software, along with the progressive prevalence of standard products, call for a different design, development and
programming of software packages in order to exploit the possibilities offered by the modern technological platforms.

On the one hand, products are becoming more and more international, and so must be producers, that are increasingly willing to abandon proprietary products that are unable to compete internationally, and often prefer to resell products of major brands. Therefore, company C’s basic market strategy aims to strengthen the sale of the core product – the ERP system - balancing the consolidation of proprietary knowledge with the exploitation of new business applications. The operational application of these strategies consists of keeping products up to date and making new technologies and solutions very simple in their use by clients. This means having a R&D division that builds a higher level of technological know-how for serving the different product lines and simplifying the work of developers and programmers.

On the other hand, local competences are still valuable, since installations are based on a local knowledge of industries, firms and people. This is especially true for international product distribution, where local players can help to deliver the product in different markets.

Therefore, from a relational point of view, the company’s focus on the core product and the inherent industries has been matched with the searching for network collaborations in order to profit from local requests of customised solutions. The firm believes that market strategies based on lead users (see company A) are at stake. Technologies and clients’ needs are increasingly complex and the efforts placed in the creation of a single industry application can be too demanding and not easily transferable to other customers profitably.

Therefore, Company C has initiated different partnerships with local consultants and software houses, interested in developing vertical implementations of Company C’s products for specific industries, triggered by clients’ specific requests: the creation of the ‘stereotypical’ vertical solution is left to the partner (except when its size is so big that a direct investment by the firm is justified). This has happened in the case of special applications regarding software for airports and naval installations, where local specific counterparts have the responsibility of product quality and maintenance, and company C is simply a seller of the standard version of the software.

New product lines have been added by the way of mergers and acquisitions: the group has made more than 40 acquisitions in its history, in order to create a complete supply system of ‘off-the-shelf’ software dedicated to different uses and business categories.

### 4.4 Company D

Company D was established in Lombardy 1991 by a group of professionals with a ten years experience in the fields of manufacturing and distribution. The company initial market focus was on small- and medium-sized companies, to which it delivers different software packages produced by local software houses, or international brands like J.D. Edwards and Mapix technologies.

The firm has gradually evolved and grown, and it now employs 250 people in its different branches. The organisational structure is flat; commitment and trust are the fundamental organisational glue. It produces and sells an ERP software based on IBM AS400 (System i) technology based on RPG language. The product strategy is based on the standardisation of the core product, combined with multiple product interfaces that can serve different uses. This has the unquestionable advantage of lowering the
maintenance costs of the product. At the basis of this approach lies the culture of abstraction, a fundamental skill in order to produce viable standard software packages.

Instead of adopting the concept of verticalisation (i.e., a software especially designed for one industry), Company D prefers to think in ‘horizontal’ terms, by designing standard software that can be configured for multiple uses by setting a number of parameters. The old logic of ‘ad hoc’ customisation, which required many installation hours at the client’s and meant renouncing to develop and refine the standard product, has been abandoned because, from the company’s viewpoint, this eventually leads to loosing clients and reduced revenues.

In terms of knowledge, this approach means being able to master a different set of relevant technologies, from programming languages and tools to communication systems and hardware management. Hence, the company aims at expanding its technological capabilities, managing internal KM systems, in all the different skills, and improving training, in order to cope with the constant evolution of the technologies.

From the relational point of view, this knowledge strategy rests on a twofold basis. On the one hand, company D has always believed in aggregation and collaboration with other firms and in particular with technology suppliers, as a way to sustain its growth strategy. Therefore, an articulated networking strategy has been implemented.

On the other hand, company D deems that the implementation of this collaborative strategy is sometimes too slow for the firm’s needs, especially for getting access to new and important technologies, that have to be handled very rapidly for fully exploiting their market potential. Thus, company D’s strategy is boosted by the acquisition of other firms: supplementary Java programming capabilities have been recently added by the incorporation of a software branch of another company.

4.5 Company E

The company, established as a small enterprise in 1977 in Veneto, has rapidly grown and it now employs 600 people, many of whom are young (the average age is 39), and 50 consultants. The company is now a big ICT player in Italy, listed in the Italian stock Exchange since 2000, with a total turnover of 60 million euro. In its evolution, company E has become a niche leader, with a market share of nearly 80% in its segment: the product is a specific solution dedicated to banks and insurance companies, specifically targeted to the management of back-office financial procedures that have to strictly meet industry requirements and legislations. The market portfolio is composed of 250 banks totalising 25,000 branches and 14 insurance companies.

The market strategy is driven by the need to face an increasing competition, in a market where some very big international groups already play. Therefore, company E’s strategy focuses on reaching an appropriate size and market share, with the continuous refinement of the proprietary products, the constant search of new clients, both national and international, and the enlargement of the supply. Partnerships can play an important role in these strategies.

Regarding the first strategic goal, the business requires continuous upgrading of processes and updating of procedures to fulfil the ever-changing rules of the financial sector. Since this is a critical activity for product development, in order to reduce the time of software modification, the company usually sets up specific focus-groups formed by professionals and institutional subjects. This allows to know exactly how banking procedures and functions have to change in order to follow new prescriptions. This
‘network centric R&D group’ (as executives call it) is normally composed of professional partners such as big consulting companies (like KPMG) and institutional subjects (such as ABI - Italian Bankers Association, Consob – the stock exchange control commission, and Bank of Italy). The group activates whenever banking procedures - or part of them - are updated or changed.

International markets are also approached by means of specific partnerships. Market expansions in Germany, for instance, have been achieved thanks to a collaboration with a large system integrator and business outsourcing partner based in London and operating in 42 countries. The partnership consists of a shared distribution activity.

The relationship with this international company has proven to be fundamental for entering a new market, where the lack of past experience and reputation represents an entry barrier. The foreign partner has later strengthened the collaboration, and has acquired a 10% of Company E’s stocks.

Clients can also have a valuable role in enlarging the supply scope, like in the case of the introduction of a new product: software for back-office operations in insurance. The new software was designed based on the knowledge accumulated in the core banking business, being the financial activities of the two industries quite similar. The migration to the new industry was not without challenges and efforts, and required a careful analysis of the needs of the new market, but in the end it resulted in a system which represents a ‘state of the art’ platform for the industry. Especially, the relationship with the first client for this new product was fundamental in order to open the market and sell it to other insurance companies.

4.6 Company F

The company, founded 25 years ago, is a small provider of about 90 employees and 4 million euro of yearly turnover. Its main location is in the Veneto region. Born as a provider of ERP solutions, the company has progressively extended its supply by including other IT products and services, i.e.: business intelligence, IT infrastructure and connectivity, web design, consulting and system customisation, etc. Markets include many different sectors, ranging from manufacturers of different industries (mechanics, agribusiness) to services (retailing, and also professional services that are serviced by an external company). The market strategy of the company is not only based on a growth in terms of sectors served, but also in terms of a supply that aims to cover “all the possible needs of customers” (as affirmed by the CEO). This growth was considered important, given that the initial core product (the ERP system) is rapidly becoming a mature technology.

In terms of supply definition, this strategy has been pursued by going in different directions. Firstly, the core ERP product was improved and additional components were added, so that the company has been more and more capable to cover other markets that are distant from the initial pool of clients. This has required not only investments in internal development, but also in networking with competitors already specialising in these new sectors, and in some cases in acquiring external companies.

Secondly, the company has opened entirely new markets, like for instance the supply of web-based systems, website development, and telecommunications services. This has also enabled the company to offer new services to old customers, and to reach new clients. To do that, the company has had to reinforce its relationship with some key suppliers, in particular big telecommunications companies. Clearly, this goes well beyond
its core ERP product, which means that the company has the need to extend its competence. Due to the strategy of extension both in direction of new products and of new markets, this improvement regards technical knowledge (new services and components), and market knowledge of potential applications and new customers. Since it was difficult to do that internally, the company has established relationships with many different partners: established customers, companies operating in other markets, and technology suppliers.

4.7 Company G

This company, that now employs 40 people, was founded in 1980 by three consultants and programmers that used to work for IBM. In those times, IBM was focusing on rich clients (multinationals and banks) and leaving small or local clients, that were considered less interesting. For that reason, the entrepreneurs decided that there was the opportunity to exploit that market niche. The company started developing specific software solutions for IBM systems, with a focus on operations management and accountability for local manufacturers of various sizes (this is still the core market, with a base of clients that tends to remain the same over the years). In little time, the company was able to produce a proprietary ERP system for IBM 38 mainframes which, in that period, were closed systems based on a proprietary programming language (RPG).

This product still represents the core business. The entire history of the company is mainly centred on the evolution and strengthening of this software package. However, following the evolution of both IBM systems and clients, Company G’s ERP has progressively migrated to more flexible versions (based on other languages such as COBOL first, and later Java) to satisfy the new requirements coming from the customers.

To do that, the efforts of the company were mainly oriented to developing its internal technical skills, from the original competence on IBM-based systems to the more innovative new programming languages. This development was essentially based on internal resources. This was made for three reasons: first of all - as the CEO affirms – it is considered absolutely “necessary to keep the pace of technological advancements” by an in-house learning process; secondly, it allowed the company to “keep a strict control” over the proprietary software; thirdly, the collaboration with external R&D centres (especially, Universities) proved to be unsatisfactory because external professionals did not have enough knowledge of the company’s core product.

Even the long-lasting relationship with IBM (the historical partner) was not particularly useful for developing internal competencies, because the multinational provider was following other directions. From a knowledge strategy viewpoint, it can be said that the company decided to invest on internal knowledge to strengthen the core product. This appears to be consistent with the market strategy, which still focuses on the same business and the same group of customers. As regards external relationships, with the exception of occasional interactions, the company appears to be mainly oriented towards its internal resources rather than seeking collaborations in the open environment.

5 Summary of results and discussion

The key results of our empirical investigation are summarised in Table 2 where the main features of the business and of its evolution, the consequent knowledge strategy that
companies have implemented, the sources of knowledge that they have considered essential for this, and finally the networking strategy they have adopted are outlined. The links between the two kinds of strategies are also stressed.

Company A, in terms of the knowledge strategies described in the previous sections (see Figure 1), appears to follow an ‘exploitation’ strategy, aiming at expanding applicative knowledge regarding particular computer applications but extending their use in new industries. This strategy, in the case of company A, was not based on a distributed network activity, but rather relied on collaborative interactions with few lead users, and can be defined as ‘open towards clients’. In particular, this strategy has been founded on one, very big Italian customer, that helped Company A launching its brand new version of the vertical ERP, and gave birth to a world-class ERP for the industry.

Company B has progressively moved in two directions: first, the market coverage has been expanded in order to exploit opportunities in other sectors that are distant from the original clients; secondly, the functional range of products and services has been enlarged, well beyond the initial system (i.e., IBM-based ERP). The pool of knowledge that was needed to make these two diverging steps was significant, and Company B’s knowledge strategy followed an ‘exploration’ approach. Knowledge sources were different, including: technology suppliers, lead customers, universities; its networking strategy can be classified as ‘open’.

Table 2 Main characteristics of business and networking strategies of the investigated firms

<table>
<thead>
<tr>
<th>Company</th>
<th>Business features</th>
<th>Knowledge strategy</th>
<th>Cognitive sources</th>
<th>Networking strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Extending market coverage (both in geographical and sectorial terms)</td>
<td>Exploitation</td>
<td>Lead users</td>
<td>Open towards clients</td>
</tr>
<tr>
<td>B</td>
<td>Moving from ERP to other applications, and at the same time extending market coverage</td>
<td>Exploration</td>
<td>Various (new suppliers, clients, universities)</td>
<td>Open</td>
</tr>
<tr>
<td>C</td>
<td>Developing ERP to serve customers in different industries</td>
<td>Exploitation</td>
<td>Lead users in various sectors</td>
<td>Open towards clients</td>
</tr>
<tr>
<td>D</td>
<td>Extending functionalities of core product</td>
<td>Expansion</td>
<td>Mainly technology suppliers</td>
<td>Open towards suppliers</td>
</tr>
<tr>
<td>E</td>
<td>Extending supply to new services, functionalities and clients in finance</td>
<td>Exploitation</td>
<td>Mainly clients</td>
<td>Open towards clients</td>
</tr>
<tr>
<td>F</td>
<td>Extending both technical components of services and markets</td>
<td>Exploration</td>
<td>Clients, suppliers, competitors</td>
<td>Open</td>
</tr>
<tr>
<td>G</td>
<td>Strengthening proprietary ERP as core business</td>
<td>Consolidation</td>
<td>Mainly internal development</td>
<td>Closed</td>
</tr>
</tbody>
</table>

Company C has progressively extended its core ERP product to more and more sectors, always focusing on exploiting the advantages of standard solutions, designed and
improved by a central R&D department, and partnering with local companies in order to obtain market expansion and outsource software customisation. This represents an ‘exploitation’ knowledge strategy, performed by means of a networking strategy which is mainly ‘open towards clients’.

Company D has modified the functionalities of its ERP product by adopting new enabling technologies (for example, new languages and architectures) capable of transforming the product significantly, although its main functions remain the same for the customers. This can be defined as a knowledge strategy of ‘expansion’. This strategy has required the acquisition of knowledge from outside, and especially from technical suppliers which, in some cases, have been directly acquired. As a networking strategy, it can be defined to be ‘open towards suppliers’.

Company E mainly aimed at enlarging its market presence, by extending the application of its core products to different markets and/or to changing needs of the original customers. In this context, what was mostly important was to make the offer evolve to follow the changing needs of markets. It can be defined an ‘exploitation’ knowledge strategy, where the company capitalises the relationship with some lead users to capture the main elements that allow the development of product improvements that can be applied to an extended market. Consequently, in terms of networking, this strategy is ‘open towards clients’.

Company F has progressively extended the coverage of its ERP product by acquiring applicative knowledge of customers operating in other markets; at the same time, it has extended the technical variety of products, which has required the collaboration with new technology suppliers. In terms of knowledge, the company needs to improve both its technical and applicative knowledge, i.e., to follow an ‘exploration’ strategy, and to do that, it becomes important to extend the network of relationship towards various entities (e.g., clients, competitors, suppliers) by adopting what can be called an ‘open’ networking strategy.

Company G has focused its attention mainly on its core product, which has been progressively improved along the time. To do that, the company has developed and capitalised its internal knowledge, which appears to be highly specific. This can be seen as a ‘consolidation’ knowledge strategy, which has exploited internal capabilities and, in terms of networking strategy, can be included in the ‘closed’ category.

The findings of our empirical investigation seem to confirm that it is possible to recognise a relationship between knowledge strategies and networking strategies of different companies. As a matter of fact, the development of the knowledge pool of a company, which is necessary to reinforce its business strategy, can require the exploitation of specific sources of knowledge. This is summarised in Figure 2 whose meaning can be explained as follows. If a company’s business strategy is based on pure incremental innovations of its core product (such as Company G), it may need to exploit internal competencies that have become progressively specific and localised (i.e., a ‘consolidation’ knowledge strategy). In this case, more than acquiring fresh knowledge from external sources, what may count is essentially the development of internal cognitive assets. This implies a ‘closed networking strategy’, meaning that the company has few interests in open relationships and knowledge exchanges with external companies.
An ‘expansion’ knowledge strategy implies that a company aims to offer technical improvements of its core product, but with no substantial changes in markets or lead customers (see Company D). If this innovation requires a significant leap for the company, it can be essential to acquire new technical knowledge that goes beyond the internal capabilities. Hence, open relationships with external providers of technical knowledge (i.e., suppliers, university labs, etc.) can be mostly important: in other words, the company may need to follow a strategy of ‘open network towards suppliers’ of technical knowledge.

A knowledge strategy of ‘exploitation’ is followed by companies that are willing to extend the market application of their product (like the cases of Companies A, C, E). This means that, more than improving a product technically, the company considers important to learn how its product can be adapted to other clients or markets that are distant from the original target. For this, it becomes crucial to extend the pool of applicative knowledge, in other words to learn how the supply can be configured or adapted to face the needs of an extended pool of clients. Learning from customers can be crucial, and this leads to a strategy of ‘open network towards customers’.

The most complex case is that of companies that pursue a double strategy at the same time, e.g. they are willing both to extend the technical features of its product by adding completely new functions or components, and to enlarge the market coverage of their products (Companies B and F). In terms of knowledge strategy, this means that companies follow an ‘exploration’ strategy. This can require exploiting different sources of knowledge at the same time, i.e., in terms of networking, following an ‘open network’ strategy.

In summary, based on the results of this study we can say that knowledge strategies that are involved with the expansion of the technological base of the firm need at least to establish relationships upwards, towards technological suppliers, that can provide basic knowledge and innovative solutions generated by their R&D departments. Strategies oriented towards a change in the applicative dimension of a firm’s knowledge base, on the contrary, require creating and fostering dense interactions with downwards actors in

<table>
<thead>
<tr>
<th>New Knowledge</th>
<th>Knowledge strategy: expansion</th>
<th>networking strategy: open towards suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological Knowledge</td>
<td>Knowledge strategy: exploration</td>
<td>networking strategy: open</td>
</tr>
<tr>
<td>Existing</td>
<td>Knowledge strategy: consolidation</td>
<td>networking strategy: closed</td>
</tr>
<tr>
<td>Existing</td>
<td></td>
<td>New</td>
</tr>
</tbody>
</table>

Applicative Knowledge
the supply chain. Other strategies are on opposite positions, with a strategic closure in case of firms aiming to keep technological and applicative knowledge unvaried, and a complete openness in case of firms that, at least in part, tend to explore technological and applicative opportunities.

6 Conclusions

The attempt to combine the notion of knowledge strategy with that of networking strategy is substantially a novel approach. Although the literature has focused on the two aspects separately, and many studies have underlined the importance of knowledge flows in inter-company networks, the combination of the two notions of knowledge strategy and networking has been little examined. The paper contributes to fill this gap, by providing empirical evidence on the linkages that may exist between the two strategic orientations. Another original contribution of the paper is that, so far, the literature on knowledge networks has mainly focused on manufacturing industries, and less attention was devoted to business services and in particular KIBS.

The outcomes of the study can be significant for both research and practice. First, the proposed classification can lead to a better understanding of the mechanisms underpinning inter-company networking. The findings show that networks can be significant in the investigated context, but different business strategies can be acted based on a different use of external knowledge and capabilities. Distinct forms of collaboration and types of partners are involved in the knowledge strategy of a firm. This also extends the firms’ portfolio of choices. The analysis proposed here can provide managerial suggestions for companies not only in the analysed sector but also in other areas.

Second, being the aim of this study mainly explorative, the proposed classification represents the starting point for new investigations and, especially, for statistical surveys that can be used to confirm the validity of the argumentations and their generalisations to other companies or sectors. Once validated empirically with extensive research, the proposed classification can constitute a set of guidelines for strategic planning, especially in a sector (e.g., KIBS companies) where strategic studies are still underdeveloped.

The research presented in this paper shows some limitations, mainly regarding the limited number of firms involved that hinders generalisability of conclusions. A larger set of qualitative cases, together with a following qualitative survey may help to overcome those limits and improve our knowledge of the matter.

Also, data and information are referred to the period of investigation; therefore some firms may have experienced changes in minor or maybe important aspects. Notwithstanding, we think that the evidence collected can well describe the relationship between knowledge strategy and networking strategy at least in the computer services business.

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Characterisation of knowledge-based networking strategies


