LEARNING IN SERVICE RELATIONS: THE CASE OF TECHNOLOGICAL KIBS

Competitive Paper

Special Track: Business-To-Business Service Networks

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Abstract

Purpose of the paper and literature addressed: this paper explores the importance of service relations in the implementation and development of complex software solutions.

Research method: given the nature of the topic investigated, a qualitative, case study-based research technique using in-depth, face-to-face interviews is deployed. The paper is based on an in-depth study of the implementation of a vertical ERP in different industries, involving different international companies. Primary data are collected through direct interviews to managers directly involved in the implementation process.

Research findings: Main findings show that service networks are relevant in the investigated context, and different business strategies can be acted on the base of different recourse to external knowledge and capabilities.

Main contribution: So far, the literature on the topic has mainly considered manufacturing industries. More modest efforts have been deployed in order to analyze services and in particular Technological Knowledge Intensive Business Services (T-KIBS).

Keywords: T-Kibs, business relations, services, co-production, learning.

INTRODUCTION

Business and industrial economics literature have underlined that relationships can be an important asset, through which firms can develop their potentialities and access resources of other actors (Håkansson and Ford, 2002). In fact, business relations can be useful to company development as they can be utilized in order to learn and develop capabilities, mobilizing external resources: in some cases firms purposely develop bonds to overcome their limits (Hakansson and Snehota, 1995). In addition, the external perception of firms' relational richness affects opportunities to develop new bonds, offering more options to learn and develop the business.

More recently, literature registers new forms of interactive and distributed innovation envisioning systems and models of "open innovation" (Chesbrough, 2003), underlining the fact that drawing knowledge from a wide range of external sources is the core capability of successful firms. Moreover, literature has underlined the role of structured relations in complex business activities such innovation (Smedlund, 2006), thus networks are emerging as solutions that allow firms to cope with the complexity of current technological and market context (Küppers and Pyka, 2002).

This paper explores the importance of inter-organizational relations in the development of complex software systems. It deals with service-based relationships in an information-intensive activity, in which the exchange of complex information is necessary in order to define customers' needs and provide individualized solutions (Harvey 1992; Coviello and Martin 1999).

The empirical section is based on an in-depth study of service relations involving different national and international producers of ERP software based in Italy and their national and international customers. Primary data are collected through multiple direct interviews to managers directly involved in technological and strategic planning for each company. Due to the particular nature of the phenomenon investigated, this setting has been chosen on conceptual grounds rather than in order to guarantee representativeness (Miles and Huberman, 1994).

Main findings show that service networks are relevant in the investigated context, and different knowledge management strategies can be acted on the base of different recourse to external knowledge and capabilities.

The paper is organized as follows. The first two sections provide the necessary theoretical framework to the analysis of the particular kind of firms investigated, introducing basic information regarding the object of the study and the approach adopted. The third section introduces the description of six cases of computer services companies in Italy. A qualitative, case study-based research technique using in-depth, face-to-face interviews has been deemed fit to provide a focused and realistic account of the investigated matter (Yin, 2003). Managerial implications and preliminary conclusions have been reported and finally a section underlying basic contributions and limits of the paper is provided.

THEORETICAL PREMISES

In the current economy, knowledge is recognized as the most crucial production factor. Since it is almost impossible to the single firm to manage all the knowledge that is necessary to compete, value chains and manufacturing activities are scattered among several business partners, each specialising in different parts of the overall process, in an extreme cognitive subdivision of work. The capability to seek, select, assimilate, and exploit cognitive resources all around the world is more and more important.

On the one hand, it is clear that the autonomous R&D in small traditional firms is very difficult and rare, due to both the small organisational (and financial) dimension, and the lack of technical and scientific capabilities. On the other hand, the simple acquisition of external technologies is not the solution: the single small firms, in fact, are not able to monitor the emerging new ideas and the technological advances, and to transform them into new products, processes, etc.

Recent literature has identified a possible solution to this problem in networking (Smedlund, 2006). In fact, innovation networks - namely systems of players that co-operate to produce, adapt and disseminate technological and managerial knowledge - are emerging as a new form of organisation that allows facing the multidisciplinary and complex character of current innovations (Küppers and Pyka, 2002).

Networking is an example of the new form of interactive and distributed innovation, a form of "open innovation" that can be clearly seen in Chesbrough's open innovation model (Chesbrough, 2003). A progressive erosion of the strategic advantage of internal R&D is in place and, according to this model, it is related to the increasing difficulty of appropriating and controlling R&D investments, also because of the increased mobility of knowledge workers. Decreasing R&D investments productivity causes many firms to turn a wide range of external sources in order to gather knowledge and expertise instead of investing massively in R&D.

Certainly, open innovation redefines the boundary between the firm and its environment, being the firm more porous and loosely embedded in networks of different types of actors, collectively and individually working toward the production, transmission and commercialization of knowledge (Laursen and Salter, 2006). However, efficiency and effectiveness of external ideas and knowledge exploitation in innovation processes are crucial.

Chesbrough (2003) maintains that firms that are too focused inward and therefore risk "to miss a number of opportunities because many will fall outside the organization's current business or will need to be combined with external technologies to unlock their potential."

Other similar conceptualizations share the same type of 'connect and develop' model, where external sources of ideas have similar of superior value in sustaining innovation (Sakkab, 2002). Accordingly, open innovators are those that integrate these external sources into their innovation processes and competitive strategy (Chesbrough, 2003).

Dealing with these topics, in this paper we focus the attention on the so-called knowledge-intensive business services (KIBS), whose core capability consists in accessing, manipulating and transferring technical and managerial knowledge. By this way, they act as disseminators of innovations, and help keeping local clusters abreast of progress and able to compete in the global markets (Thomi and Böhm, 2003; Wood, 2006; Bolisani and Scarso, 2009).

KIBS require the exchange of complex information, in order to define customers' needs and provide individualised solutions; examples include management consulting, market assessment, design and engineering, software development, social-based human services (Harvey 1992), and other 'pure services' (Coviello and Martin, 1999). Customisation of output is a distinguishing aspect of information-intensive services; for example, Rhian et al. (1992) noted the highly customised nature of professional services.

In particular, this paper focuses on a specific category of KIBS that is computer service firms, trying to give answers to basic research questions: - How can external service partnerships and service networks contribute to learning and innovation processes in computer services activities?

COMPUTER SERVICES AS KIBS: AN OVERVIEW

The term “computer services” generally includes the supply of computer software and related services (see the OECD definition, as discussed in Howells, 2000). The boundaries of this industry are not unambiguous, and can also include firms classified in other industries (e.g. original equipment manufacturers, management consultants, etc.). Here, we will explicitly focus on firms whose core activity is the supply of computer services.

There are some relevant issues of computer services seen under the perspective of innovation (Howells, 2000). The development of software business can contribute directly to the employment and GDP of a country, but, what is more important, can influence the growth of manufacturing and service industries, because ICT systems are essential for business processes and, thus, competitiveness.

Computer services are a highly labour-intensive industry, based on the exploitation of knowledge workers and specialised competencies. Although efforts have been made to structure and formalise the design of new software (see e.g. the CASE approach, and the “software factory” organisation), or to reduce the cost of labour by outsourcing tasks to low-cost but qualified professionals (e.g. Indian firms), it remains a very costly and time-spending activity. While the price of hardware has progressively fallen for at least two decades, this has not occurred to software and services that represent the major portion of investment costs of a new information system. In short, the production of software is a costly and knowledge-intensive activity.

The process of providing software and computer services to a business user raises special problems as well. The implementation of a new information system in an organisation implies issues such as: careful analysis of requirements, selection of appropriate technologies and vendors, proper design and implementation of the system, training and maintenance, etc. Any system is the combination of standard technologies and modules designed or adapted specifically. This is the reason why a subdivision of specialisation can be found in the industry. Beyond the conventional difference between hardware, software, and service suppliers, there is also a pronounced distinction of activities in the same category, as they can be very different from a supplier to another.

For our purpose, there is an important distinction between:

- large companies providing standard software solutions or modules (e.g.: Microsoft, Oracle, etc.): they are often the “sources” of mainstream technological concepts, and normally produce the “bricks” used by others to build specific systems;
- integrated companies providing specific applications, partly based on standard modules (see above), partly representing new systems (e.g.: SAP);
- small- to medium-sized software houses that develop (at least in part) customised solutions for smaller or local customers; such solutions can be original but, more often, are built on available technologies (in particular this category is relevant for the analysis we are conducting here);
- companies (generally, small software houses) that customise standard solutions or integrate modules produced by others;
- pure resellers of standard software.

The way software and services are developed and delivered to the customers is very different from one firm to another. Some studies prove that the proximity between customers and clients might be irrelevant for standard products, but can be essential in other cases, and especially when continuous interactions with actual and potential clients are required to develop more effective and tailored solutions (Jones, 1994). A producer of standard software can be very far from its customers, while a developer of a customised or highly specific

solution has to be “stuck to the clients” to better understand their needs and translate them into appropriate configurations.
In some cases, even large producers of business solutions (e.g. SAP) need a network of small firms that customise and resell their products. In addition, some studies (Egan, 2001) highlight the importance of application districts, i.e. areas where computer service firms operate in direct contact with specific customers, and can specialise in software solutions for a particular industry or application field. In fact, the localised nature of innovation requires that, in most cases, the user is serviced through a direct interaction. In turn, the supplier can exploit this interaction to learn from the customer. Very often, a solution implemented for a client is then adapted and transferred to other customers.
The relationships of local suppliers with the customers and, in turn, between suppliers themselves, and with other external providers, thus create an innovation network, composed by various firms operating at different levels. At one extreme, large multinationals define the standard technologies and the “global platforms”, while at the other extreme, there are local software vendors and “application districts” that elaborate and combine standard technologies locally, to provide solutions that fit the specific user needs.
Our analysis aims at investigating the intermediate part of the innovation network, that is firms that produce software products and services in order to fulfil final customers needs in terms of Enterprise Resource Planning (ERP) solutions. We aim to analyze in what extent and in what form service-based networks are present in their business, and what is their main function.

THE EMPIRICAL RESEARCH

APPROACH AND METHOD OF ANALYSIS

To achieve research’s objectives, the research method must be one that lends itself to both exploration and theory building. This objective makes qualitative research a particularly attractive research tool as it seeks to explain how networks are relevant for the innovation in the production of ERP software in Italy.
The context of the study is important here and the qualitative method allows researchers to understand the context-specific depth of a phenomenon (Bamberger, 2000). This method also allows the researcher to investigate a contemporary phenomena within their real-life context (Yin, 2003). In fact, since it is a complex phenomenon, investigation calls for direct contact with the respondents. As such, it is likely to provide a better understanding of the knowledge strategies implemented by computer service firms.
Therefore, a qualitative, case study-based research technique using in-depth, face-to-face interviews can provide a rich, focused and realistic account of the investigated matter. Indeed a multiple case-study analysis was conducted, 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 suppliers capable of (at least partly) producing and distributing proprietary software products, based on existing technological bases. Cases have been selected on the basis of their importance (revenues) in the Italian market, focusing on firms with proprietary products and trying to represent major segments and specialization of the computer services sector. This setting is chosen on conceptual grounds rather than for its representativeness (Miles and Huberman, 1994).
The case-studies were conducted during 2009 and 2010 using multiple sources. General information on the firms were collected from various documental sources (i.e.: company literature, websites, press, etc.). After that, semi-structured interviews were conducted with

key managers (especially in the marketing and EDP departments), to validate and complete the data collected. To gather comparable information, a common checklist was used in managing interviews.
The emphasis of the interviews was on the following issues:
- the products/services supplied and their features;
- the sources of innovations and knowledge, internal and external;
- the relationship mechanisms and knowledge exchange with external service partners;
- the role of customers in innovation processes and other business activities.

The following sections report basic information regarding the investigated firms; final paragraphs will then summarize main findings and limitations of the study.

Table 1 – An outline of the examined cases (names are disguised for confidentiality reasons)

Case	Products	Main market	Size	Focus of service relations
A	Vertical ERP	Fashion and retailing	200	Lead user as a key to new markets
B	ERP	Machinery, Food	250	Network of lead users as software improvers
C	ERP components	Public administration, professional services.	1800	Distribution partners as developers
D	ERP	Manufacturers	250	Lead user as triggers of learning processes
E	Vertical ERP	Banking, insurance	650	Network of professional and institutional representatives as compliance experts
F	ERP, Vertical ERP	Manufacturing, services	90	Production partners as cost reduction enablers

COMPANY A: LEAD USERS AS KEY TO NEW MARKETS

Company A is the Italian branch of a multinational service company - with headquarters in USA and three major offices in Australia, Asia and Europe - that employs 92,000 professionals globally in more than 90 countries. It is a world leader in Information Technology services, developing its offerings in Consulting, System Integration and Outsourcing. Company A has been present in Italy since 1999, by the means of the acquisition of a network of local software houses. One of those companies is based in Padua (in the Veneto region) and is nowadays the multinational's branch specialized in the Fashion & Retail (F&R) industry. With total revenues of 115 millions Euro (in the year 2008), and approximately 200 installations in Italy, Company A holds nearly 70% of the domestic market.
Company A offers an integrated solution for the fashion industries, with peripheral services of Change Management, and complete Information systems outsourcing. Services are rendered by a team of 200 professionals that operate in the F&R business in Italy.
Company A's market penetration strategy has been boosted by the acquisition of one very big customer in Italy. In 2004 the client set up a software selection task-force, involving internal staff and external professionals, aimed at evaluating the implementation of a new ERP solution in substitution to the heavily self customized one it had. Company A finally obtained the contract. The implementation 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.

Particular management practices were the first problems to solve for company A. Those particularities required an intense and deep interaction between the provider and customer in order to explain the management practice and to have it managed by the new software. For that reason a series of customizations and parameterizations that made the project delay for almost one year. At present, client's CTO says "we have got over the hump" and three company A's technicians are still at client's in order to help people to get rid of the remaining implementation tasks.
"With us company A has refined a lot a components of the software", says client's CTO, "that have been useful in the case of other implementations" (such as big fashion names like Armani and Versace). In fact, to solve problems related to databases queries (whose performances went down with the change of the systems) CTO had to hire external people coming from Oracle in order to monitor and change parts of the software that were hindering the performances of the system.
The whole industry is going towards investments in foreign markets and towards a great deal of expenses in the construction of the distribution channels, in which "the experience with the client is precious, even though the fashion world is extremely differentiated" says company A's Retail manager.
The entire implementation experience was deemed satisfactory by the client firm's CTO, that affirms "we succeeded because we proceeded together". The success factor was local people from Company A that had been working and are working at client's, that participated in the project, attended several meetings and shared the client's values and symbols.
The importance for company A of the experience done with the client is by the way testified by a consequent organizational modification: the creation in 2007 of a new "South & Western Region" Fashion business unit, that includes Italy, France, Belgium, Luxembourg, Spain and Portugal. The new Business Unit has its headquarter in Italy and can now count on "the experience of 200 International installation in well known brands such as Gucci, Giorgio Armani, Champion, Dolce&Gabbana, and Versace", totalizing a market share of 60% in Italy.

COMPANY B: LEAD USERS AS SOFTWARE IMPROVERS

Company B is a medium-sized software company based in the Veneto region, but with other 4 headquarters in Italy. It produces ERP integrated solutions. It also founded a national network upon which it bases its distribution activities. The software is run by approximately 2,000 customers, accumulated in 25 years of software production. In total, it employs 250 people, 64 of which in R&D department, and operates prevalently in the mechanical sector, even if some new clients in food and fashion have been reached. The company's ERP is an RPG-based software mainly focused on Ibm's "System i" hardware, having the firm a long tradition in using such technology. This means, for example that the firm has a tight relation with Ibm's Rochester Development Center, that is crucial in order to have a guide in facing the future evolution of technologies.
Some other collaboration experiences are relevant in order to understand the firm's approach to knowledge consolidation and exploitation strategies.
Firstly, the firm bases a relevant part of its consolidation strategies on a co-production activity in collaboration with its key-clients. Indeed it has settled up partnerships with its biggest customers, in order to involve them in the development of new functions and components of the software. With the words of the Marketing Director "relations with partners is a complex task that requests a lot of attention. Differently from the past, it is necessary to manage it in a more transparent way; costs, time and responsibilities for both parties must be clear from the outset and have to be detailed". All the details of the

collaboration and co-production have to be the object of a partnership contract, following a quite clear division of work between the supplier and the customers, where the firm commits itself in the software development and the customer in testing the result of the development activities and providing timely, detailed and reliable feedbacks to project leaders and developers.
Several customization solutions have been developed in this manner, following client's needs and becoming afterword stable parts of the standard product. Nowadays, there is no more room for opportunistic behaviours that once tended to exploit customizations as a base for developing standard solutions at the expenses of the customer (that has to pay for the customization of the software). The barter has to be formalized, the benefit is mutual. And in this way the firm can in a sense industrialize the process of customization of the software, gaining in efficiency and productivity. The same partnerships are moreover critical in helping the firm in innovation strategies, such as the project of transforming the RPG script in a more modern RCP (Rich Client Platform) product: the first version of the new software will be distributed to partners next year in order to debug it and develop its functionalities.
Secondly, also some exploitation strategies are clearly based on key clients, carefully cared for. Among these there is a relation with a local mechanical firm, recently incorporated in a vast multinational group operating in 18 countries with 1700 employees. This is relevant because is indeed with the joint effort of this firm that the Company B extended its standard package with the module of foreign taxation. The client's needs – those of a big and articulated group of enterprises - triggered in fact the effort of settling a component of the software that previously was not present. For these needs the company also involved an international network of financial and accountancy consultants, a branch of which is based in a nearby, and whose relationship is based on an open contract.

COMPANY C: LOCAL PARTNERS AS DEVELOPERS

Company C is composed of a constellation of firms that operate both in the national and international contexts. Based in Lombardy, it has more than 1,800 employees and 800 distributors in Italy, Europe and the United States. The customers are more than 60,000, with more than 450,000 procedures installed. Abroad the group is present with consociates in USA - where it distributes a wide range of work access controls - and in Romania, with a new company that produces software for human resources management designed to face all related administrative tasks.
As mentioned, this company has a network of 800 partners, firms that operate both in Italy and abroad, that mainly participate in the activities related to the distribution and refinements of the standard products in the offering. For this relational form an entrance fee is set, in order to guarantee the commitment in the mutual development of products.
The growth strategy of this company is based on a progressive plan of mergers and acquisitions in order to acquire different products and software components, together with market demand. In its history, the group has totalized 48 acquisitions.
The firm believes that innovation strategies based on lead users (customized solutions that become standard with minimal effort) are at stake, because the technology and clients' needs are increasingly complex. Products are becoming more and more international, as are producers. In this context, companies are increasingly willing to abandon proprietary products if unable to compete with the international standards, starting the distribution of major products.
In fact, international product distribution is based on local (and frequently very able) partnerships for installation, and major companies are always in search of small and medium local players in order to complete distribution in different markets.

In this direction, company C has built a distributed research service network, mostly based on partners. The basic strategy is to completely privilege the standard product centrally, and to carefully initiate several partnerships locally in order to develop vertical implementations and special solutions, triggered by clients' specific requests. This has happened for example in the case of special applications regarding software related to airports and naval installations (such as with the group Costa Crociere). Only in case of very big projects, this rule is amended and an internal solution is developed.
Finally, also relations with Universities are important for innovation: company C uses to temporarily employ university students in specific projects related to the exploration of possible new components of the software or to the refinement of the software efficiency and in general its performances, with studies on database's access and memory optimization.

COMPANY D: LEAD USERS AS LEARNING TRIGGERS

Company D was established in Lombardy 1988 by a group of technicians and friends with 10-year experience in the field. It employs 250 people both for production (in 2 sites) and in distribution. The organization structure is flat, commitment and trust are the fundamental organizational glue.
The focus of this company is on small- and medium-sized manufacturing companies, to which it delivers customized ERP solutions based on Ibm's AS400 (System i) technology, a product that is designed to be operable in different technological environments.
Regarding the evolution of the product and the knowledge base, the company testifies the importance of sophisticated and exigent customers in order to learn more. In the words of the CTO: "The cases in which we have learnt more is when managers of the client firm are very pretending, even difficult". Clients are the base of growth strategies, that consist of new configurations for different needs of production and distribution, that can be applied in the solution of other customers problems. And a big customer in a new market becomes a fundamental weapon in order to sell more in that market.
In order to consolidate the position in the market also acquisition of other firms are valuable – especially when rapidity is important: supplementary Java programming capabilities have been added last year by the incorporation of a software branch of another company. The company's CTO says "the fundamental point is to reach the critical mass in terms of people and solutions" the firm has, and this can be reached through M&A and partnerships. "Only this way one can serve bigger clients".

COMPANY E: PARTNERS AS COMPLIANCE EXPERTS

The company, established in Veneto in 1977 as a software producer for manufacturing industries, with 600 employees and 50 more fixed consultants is nowadays one of the biggest companies in Italy, listed in the Italian stock Exchange since 2000.
The firm is a niche leader in Italy, with a market share of nearly 80%: the product is a specific solution dedicated to banks and insurance companies, specifically dedicated to the management of back-office financial procedures, that have to strictly follow industry rules. Customers portfolio is composed of 250 banks totalizing 25,000 branches.
In this business, innovation strategies are largely based on a constant consolidation of knowledge, upgrade of processes and updates to fulfil the ever-changing rules of banks' finance. Since this is a critical activity, the company usually sets up specific focus-groups formed by professionals and institutional subjects, in order to know exactly how banks procedures and functions have to change in order to follow new prescriptions. This "network centric R&D group" (as they call it) is normally composed of professional partners such as

Kpmg and institutional subjects such as ABI (Italian Bankers Association), Consob (the stock exchange control commission), and Bank of Italy. It is activated whenever procedures or part of them are updated or changed. The focus group is off as soon as a clear picture of the normative requirements is reached: that way, the company is able to reduce software modification timelines.
However, company E also bases its market strategies on foreign customers. Market expansion in Germany, for instance, has been based on the partnership the company has settled with a MNE based in London, a system integrator and business outsourcing partner that operates in 42 countries employing 8.600 people.
Similarly to the case of company A, the partnership with this international company is fundamental in order to enter a foreign market, where the lack of reputation frequently acts as an unavoidable barrier to growth. The partner, that is also a client for the finance platform, ended up in investing directly in 10% of Company E's stocks. In addition, a mutual agreement for reciprocal products and services distribution has been set.
Another important partnership is the one the firm has established with an international company that produces a world-class ERP, a 4,000-employee multinational enterprise. This partnership involves the exclusive distribution of an ERP software for manufacturing firms: for company D, this means to renounce to a similar proprietary software, and to stop any investment in development in it for the future.

COMPANY F: PARTNERS AS COST REDUCTION ENABLERS

Company F, based in the Lombardy region, produces and distributes ERP solutions for small- to medium-sized manufacturing enterprises. Recently, it has been incorporated in a bigger national group operating in the business of telecommunication and system integration, that is recently committed in a strategy of range extension.
The production department is based in Lombardy and can capitalize on capabilities regarding different software generations accumulated in a long history of software programming. Company F's core capabilities lie in the research and development laboratory, composed of 40 people, while the company employs a total of 90 people.
Its recent market strategy is based on a progressive specialization of the software in different industry (vertical) applications. This is a typical case of innovation strategy based on the exploitation of existing knowledge, and the company pursues it through a series of partnerships that are intended to gather the necessary capabilities in a quick and effective manner. For instance, for the development of the metallurgic industry's "vertical" ERP, the company allied to a small producer – a 25-people company also based in Lombardy - that already had a specific product, suitable to be integrated in the company's platform. The same applies for another case of exploitation, that regards a specific application for quality control, where the company allied with a firm with a 20-year experience in the production of software for process management measures for medium and large industrial firms.
However, a service relation that is of particular interest here is the one company F initiated in 2001 with the University of Tunis. Thanks to this partnership, the company is now able to employ 13 people that work in a joint-venture with local entrepreneurs located in Tunisia. Tunisian people have been staying at the company's headquarter in Italy several times, in order to attend courses and on the job training. That way foreign key employees have been given the fundamental knowledge of the software and its functioning logics, as well as they have learnt organizational procedures and work routines, as well as company F's work culture and values.
The foreign alliance is already an important part of the production strategy: it participates in producing and testing parts and components of the standard software product, permitting a

consistent cost reduction of software development. In the strategy of company F, this foreign initiative is going to become the main production site in the future.

MAIN FINDINGS

The cases reported show that service-based relationships can be very important in the computer services sector: external resources are activated through inter-organisational relationships, adding to internal resource-based options and permitting a single enterprise to choose the solutions that best adapt to its knowledge patrimony.

External resources are gathered through the implementation of different types of strategies, that in certain cases envision open innovation networks. In general, we detected a relevant activity of inter-organizational networks construction, based on contractual agreements. In general, service relations can be a valuable source of resources and learning in different types of activities.

Firstly, on consolidation of core activities – a typical internally managed affair - activating resources that can help in order to boost firm's efficiency (company F) and cope with the continuously evolving technological scenario of programming languages (company D).

Secondly, service relations can be useful in order to expand capabilities and the range of activities. At this regard, we have to underline that just reselling packages made by others is generally considered very risky. The development of a (at least partly) new "proprietary" solution is thus seen as a way to maintain a complete control over the systems, and assure other possible advantages in terms of software upgrading and additional customer service.

In other words, the sampled firms prefer to maintain their independent business, which is, up to now, considered an essential ingredient of their profitability (only in one case the board decided to abandon an internal product in order to focus on another proprietary technology); and also in this matter a relational approach can be applied (see company B and C).

The correct meaning of "proprietary" in this context has to be explained. It is not the generation of completely new ideas or technological concepts but, rather, the production of new specific applications which is a costly and time-spending activity, and implies relevant investments. In particular, since reputation is the key market driver and local suppliers do not have well-known established brands, their attraction capacity is normally limited. On the one hand, this means that proprietary applications tend to guarantee interoperability with different technologies and ease customization; on the other hand, it means that partnerships can be fundamental in overcoming market barriers due to reputation (companies A, E).

Business strategies may need knowledge not directly related to the technology of computer services firms, but knowledge relevant in order to better understand clients' processes and any legal and administrative requirements companies have to fulfil in order to comply with national legislations. In this cases, differently from what stated above, both national and international networks are in place, involving external professionals and also institutional subjects, in order to obtain in the fastest way possible the correct routine to insert in the vertical or general purpose software (company E).

Service networks can also involve customers in general or, better, a selected group of customers (companies A, B, E). These must be willing and capable of collaborating in the development of the software, and are intentionally involved by the firm in a projected development plan with a very detailed contractual agreement in which – differently from what used to happen some times ago - every aspect of the deal is made extremely clear. It has to be considered that, in general, any project requires a long-lasting interaction with customers and involves mutual learning.

Those agreements are deemed crucial by computer services firms, and in some cases can serve also in knowledge-expanding strategies, when new components or versions based on

upgraded technologies have to be distributed to a restricted range of lead-users in order to have first feedbacks on the utilization (see in particular company B and D). The market relevance of involving customers in the development of new vertical solutions cannot be underestimated, since it can also be a first step toward internationalization (that normally is a form of exploitation of firm's knowledge). The case of internationalization is particular interesting, and normally follows clients' processes of growth and internationalisation or even delocalization (company B). In this case the relevance of external networks is even more important, since national specificities are acknowledged through the contribution of other KIBS operating on the international consulting scene, like major consulting companies and specialized international networks with peripheral branches in Italy or hyper-specialised service providers that happen frequently to be local but acting internationally.

Regarding the innovation that exploits the knowledge base, this is more frequently approached recurring to forms of external resources use, where close relationships with small local software houses or service firms are important (company C). In fact, small local specialized firms are fundamental actors in helping the firm in exploiting new businesses and applicative versions of their products, and are considered particularly useful for secondary time-spending activities (e.g. the development of parts of software, or system maintenance), and to improve service levels. However, these relationships can generate "peripheral innovations", that may later on be incorporated in the standard software, if the applications market develops. However, these experiences can also give birth to more structured initiatives, that can generate joint ventures or the merging of the companies involved (company F).

Exploitation strategies can follow also a completely networked path, where the innovation is introduced in the firm by the way of an external partner that becomes the developer of the solution and the project leader. This strategy is particularly followed when the firm doesn't want to de-focus from its main business, and happens to major companies with a well established standard software (company C). Indeed, the focalisation in an industry or class of applications is regarded as a key factor of competence accumulation and competition.

MANAGERIAL IMPLICATIONS: A TENTATIVE MODELIZATION

In order to arrange a discussion on the managerial implications suggested by the empirical research, we propose a first attempt at modeling the results described in the previous section.

We can capitalize on the well-known Ansoff's product/market strategic matrix (Ansoff, 1957), and subsequent knowledge strategy classifications based upon it (Von Krogh et al. 2001; Landoni et al. 2008; Scarso and Bolisani, 2009), (see fig. 1).

This well known marketing tool, first published in the Harvard Business Review (Ansoff, 1957), is mainly used by managers as a schema for growth marketing strategies: it categorizes strategic choices to achieve growth depending on two fundamental variables: the product, that here is constituted by the software produced by the company, and the market served.

The first strategy is market penetration, in which the firm markets its existing products to existing customers: this is rather a conservative approach aimed at consolidate market presence and the knowledge on which existing products are based. With this strategy the firm aims to maintain its market share or improve it targeting its existing markets or segments without substantially modifying functions and performances of the applications.

If the company sells its applications in a new market, it is in the market development quadrant. Here the product remains the same (apart from minor adaptations), but it is

marketed to a new audience, that can be a new geographical market or segment (export is the typical example of market development).
Product Development is the symmetrical case of the previous. Here a new solution is marketed to existing customers: typically a new offering or an updated one (or part of it) is developed to replace existing ones and distributed to existing customers.
Diversification is the more complex solution, since it combines novelty of the product and of the market together. This is where we market new products or solutions to new customers.

Figure 1 - Four strategic approaches to service networks in KIBS

	Application (product functions)	
	Existing	**New**
Market		
Existing	***Market penetration*** Partnerships and joint ventures with low cost / specialized producers, lead users as product refiners (cases D, F)	***Product development*** Lead users as developers and testers (case B); professional partners as prototypers (case E)
New	***Market development*** Lead users as key to new markets and knowledge triggers (case A)	***Diversification*** Distribution and research partners as developers (case C); lead users as knowledge triggers and key to markets (cases A, B, E)

Business relations can be valuable resources in order to maintaining market position, as we can see in cases D and F, where well designed partnerships with specialized and comparatively cost advantaged operators are helpful in order to gain production efficiency. Also the typical service-based look to customer to increase productivity is still valuable, since customers (also organized in networks) can be valuable application refiners and testers.
Professional networks are indeed fundamental in order to understand in which direction environmental variables (like technologies, rules, legal prescriptions) are going, as we see in case E.
Specialized partners are also fundamental in diversification strategies, where they act as knowledge brokers among local users and the standard software, frequently suggesting new functions and even totally new applications, as we can see in case C.
An overall look at figure 1 cannot miss that a basic commonality among cases regards the relation with customers, that is always important in shaping the features of the product and sometimes can be strategic in order to have it developed in the specific way a particular industry requests. Customer relations are in fact relevant in order to sustain business strategies, since applicative knowledge can easily be gathered from an intense interaction with best players in a specific industry. The feedback from customers is thus a fundamental element of knowledge: indeed, the information collected from customers (with formal or informal mechanisms) is essential not only for developing the specific project, but also for transferring such experience to other situations or clients.
To innovate with customers can have also fundamental market effects. Especially when it involves sophisticated clients - usually big ones and leaders in their market – it allows computer services firms to accumulate an extremely precious experience on best-practices than can be re-used in following market relations (company A, B, E). On the other side, as we mentioned, it represents a valuable reputation to be used in further expansion in the market as

an element of marketing communication. In fact, this is a critical element in the evaluation of an experiential service such as the one produced by computer services firms.
Finally a comment on the need of balancing different types of strategic approaches. While, as we mentioned, the first strategy is rather a conservative approach which may be not risky in the short run, it can weaken the position of the company especially in highly dynamic environments. Diversification is more risky and requires a particular attitude to innovation of the organization; 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 strategies for growth by avoiding being kept locked in a specific domain but, at the same time, avoiding the risk of investing in completely new areas.

CONTRIBUTIONS AND LIMITS OF THE RESEARCH

We believe that our analysis of the relevance of business relations in computer services companies in Italy can provide some insights on the importance of networks in KIBS in general, in particular highlighting how different inter-organizational relations can participate in the various strategies firms pursue.
However, the research is in its first phases and the study has some limitations that can provide a starting point for a research agenda. Firstly, the scope of the firms sample has to be extended, in order to cover all the major national players. In addition, a more detailed explanation of how business networks are established, work and perform is necessary in order to understand the value of and the situation in which building relations is a viable strategy Kibs' success. Finally, as external sourcing becomes a viable management solution to innovation, the role of relational capabilities of the firms and relationship-specific investments have to be investigated.

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