The role of network organizational model for SMEs development

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Abstract: **This paper aimed to analyse the evolutionary courses taken by small and medium enterprises (SMEs) in response to environmental changes still ongoing. The survey was carried out by administering a semi-structured questionnaire. Various aspects related to firm management and organisation were investigated and special attention was paid to the management of inter-organisational relations and knowledge. Our preliminary results showed a scenario of intense relations between firms but scarce pooling and exchange of knowledge and expertise. This is also reflected in the low level of endowment encountered in Information and Communication Technology (ICT) systems and applications.**

***Key words*: networking, SMEs, ICT**

I. INTRODUCTION

The radical changes that have occurred in the competitive in recent years have driven firms to seek new development pathways able to cope with the growing complexity of the business environment and ensure access to new sources of competitive advantage. The survival and development of enterprises, regardless of size, is possible only if they are able to *recognise* changes under way, *predict* those that will be produced and *respond* appropriately.

The recent literature and business practice have shown that firms have developed new organisational models with a high degree of operational and decisional flexibility and considerable organisational disintegration. The organisational models emerging fall into three main categories: Virtual Enterprise (VE), Extended Enterprise (EE) and Cluster (CL). Despite the differences characterising such models, they represent a possible response to the greater complexity and instability of the business environment.

This paper is part of a broader research project which aims to analyse the evolutionary courses taken by small and medium enterprises (SMEs) in response to environmental changes still ongoing. Various aspects related to firm management and organisation were investigated and special attention was paid to the management of inter-organisational relations and knowledge. Our preliminary results showed a scenario of intense relations between firms but scarce pooling and exchange of knowledge and expertise. This is also reflected in the low level of endowment encountered in Information and Communication Technology (ICT) systems and applications.

II. LITERATURE REVIEW

Faced with this scenario, firms have had to implement far-reaching renewal processes based chiefly on two elements: on the one hand, the need to acquire a flexible and elastic organisational structure able to adapt swiftly to changes under way; on the other, to acquire tools to manage and transfer knowledge such as *ICT*. The Internet and technology generally termed *e-business technologies* offer firms new possibilities for collaboration, access to and sharing of information and knowledge, but above all allow firms to manage relations along the supply-chain effectively and efficiently.

All this has been translated into the emergence of new organisational paradigms which go beyond the confines of the traditional firm and that adapt better to the new competitive scenario. The technical debate on the development pathways of firms has shown two emerging organisational models known as VE and EE. The recent literature has also reappraised the conceptual category of the CL.

Network organization models: a literature review

In the last few years firms have had to deal with a massively changing scenario, characterised by:

- growing *market globalisation* which produces an increase in the rate of new product introduction and reduces their life cycle;
- *intense competition* due to the increase in the costs of acquiring production factors and fierce international competition;
- new *customer requirements*, resulting from the demand for products with greater degree of personalisation, higher quality and lower *delivery time*s;
- new *social conditions* due to the increase in environmental awareness and legal pressure;
- great *acceleration in the rates of technology diffusion and adoption*, especially in network technology or ICT.

Virtual Enterprise and Extended Enterprise: comparison of new organisational forms

Forbairt (1996) defines VE as *"…..a response to the speed and globalisation of the digital age; it is an enterprise that exists as a combination of specific skills from individuals or*

enterprises". A VE may be created with the aim of exploiting a business opportunity on the market. When the life cycle of such an opportunity is exhausted, the VE is dissolved and its relative members identify new partners to pursue new objectives (Martinez, et al., 2001). Virtual products and services are developed and delivered using the support of electronic links, permitting a substantial reduction in costs and the possibility of reaching distant markets simply and rapidly. Unlike other inter-organisational forms of enterprise, the VE is characterised by equal relationships in the absence of hierarchies and there are no authorities that impose rules from on high. Roles and competences in the VE are generally defined by a third subject, the information/network broker who also deals with implementing the technological platform that constitutes the soul of the VE. While the link between the firms that participate in a VE is represented, at the strategic level, by the deep-rooted desire to achieve common business goals, at the operational level it consists in the adoption of standard platforms and the integration of information systems.

By contrast, the EE is based on long-lasting contractual relationships. Indeed, Davis and Spekman (2003) define the EE as *"……the entire set of collaborating companies both upstream and downstream, from raw material to end-use consumption, that work together to bring value to the marketplace."* They argue that the advantage of an EE comes from the ability of an enterprise to be part of, and at the same time swiftly use, the entire network of suppliers, sellers, purchasers and customers. The EE is less flexible than the virtual model, but its strategic horizons are much wider. However, both arise from a collaborative approach: through collaboration all the members of a network, in contributing to achieve a common objective, may draw some advantages.

With the introduction of the concept of EE, the traditional value chain is radically changed. The extended enterprise generally forms around a central player (usually a large firm which in the supply chain occupies the role of assembler) which assumes the role of *network coordinator*. Around it, there takes place a reconfiguration of roles and relationships between the various actors, switching from a value chain to a real *value constellation*.

Reappraisal of the cluster as an organisational model for SMEs

Although CLs of SMEs were first analysed by Marshall in 1920, they have long been neglected by economic theory. During the 1970s, the traditional large industrial firm underwent a crisis, and production systems based on the SME began to show dynamism based on *flexibility*. At the same time, integration and collaboration among different firms, as well as their proximity, allowed the same degree of regional coordination and efficiency that may be achieved in large integrated enterprise. In all this, the role of local organisations, whether public or private, is very important: local government, specialised technical agencies and sector associations, universities, research centres, technical education and professional training institutes and trade unions that constantly expend energy to protect and empower local economies.

The term *clustering* means grouping and is a spatial concept (unlike the broader concept of *networking* which also concerns firms far apart), and may describe enterprises located in the same area and which participate in the same production process. The key concept is that of *synergy*. The advantages of this development model lie essentially in the fact that the existence of many actors in the district may help achieve significant competitive advantages at the systemic level which might not be obtained individually. In other words, the spatial aggregation of many firms leads to a particular condition of *regional efficiency* (Becattini, Sengenberger, 1990). *CLs* are defined as "systems of flexible specialisation": the breakdown of the production cycle into so many distinct phases allows, at the same time, individual firms to be highly specialised in a particular product, process, technology or service (unlike what occurs normally in small isolated firms), but also to be more flexible overall (compared with a large *Fordist* enterprise). It is chiefly the workforce that becomes more adaptable and flexible. The work required is mostly specialised, but also less unionised. Collective flexibility permits a rapid response to outside changes, the production of highly differentiated goods, the development of specialised firms in supplying input, rapid absorption and diffusion of new technologies and market information, and development of an experienced and skilled local labour force.

III. RESEARCH METHODOLOGY

The new firm organisational models analysed above have the potential to facilitate co-operation especially in the context of SMEs operating in the same geographical area (Porter M. 1998). Starting from this, the basic idea of this paper to study how small firms are facing up to new business challenges and how they are adapting their organisational structures to new emerging models.

The paper attempts to assess whether this network of firms has the potential to evolve towards one of the models described above in the near future. To explore this research problem, a questionnaire survey was carried out. The survey data consists of 25 SMEs and was established in 2015 with two essential targets: i) to respond to the economic problems in the local context, and ii) help member firms to increase their product quality, develop R&D efforts and gain better market positions. The survey was based on a semi-structured questionnaire organised into 60 questions and the following 9 sections:

A. Company profile	F. Technological assets and R&D activity
B. Knowledge management	G. Strategy
C. Products/services realized	H. Human resources management
D. Customers	I. Quality management
E. Relationships	

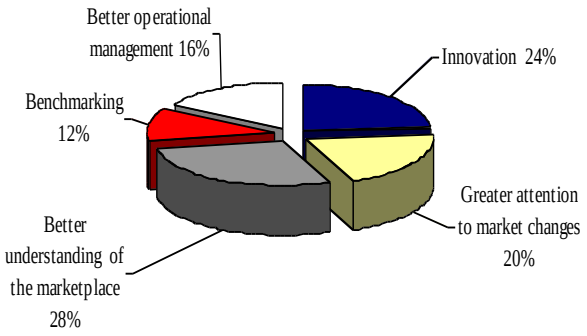
The questionnaire was first discussed in a focus group and then tested through pilot interviews in three firms. It was then re-

focused and re-structured according to suggestions and feedback received. The questionnaires were compiled during face-to-face interviews with entrepreneurs and managers of firms.

IV. RESULTS AND DISCUSSION

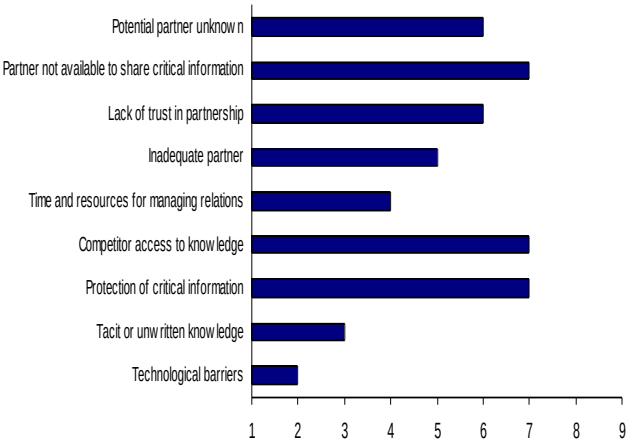
There is currently not very much confidence in the benefits that this tool could bring in the management of operations of shared interest within a framework of possible partnerships. In our opinion, this is due to the scant reciprocal knowledge among firms which has prevented substantial development of forms of collaboration among them

Fig. 1 - Benefits of the knowledge management system (KMS)



However, the greatest barriers[1] to implementing KMS in the district (Fig. 1) seem to be dictated by the need for companies to preserve their own intellectual assets from the opportunist behaviour of potential partners. Yet such obstacles may be overcome by intense effort in terms of a growth in mutual trust, which may also be the result of collaboration first on shared projects, then in partnership and, finally, in forms of evolved collaboration such as those characteristically found in the VE.

Fig. 2 - Knowledge-sharing barriers



It is worth proposing a further diagram (Fig. 2) concerning information which firms are willing to place at the disposal of others or that which they are willing to purchase in a possible KMS platform. From figure 2 it clearly emerges that for all the points investigated, interest in exchanging knowledge and information on competences, results and best practices is fairly high, both in terms of input and output, both for core elements and non-strategically important elements. Moreover, there is the striking appreciation on the part of the district firms concerning the possibility of the KMS platform facilitating contact with other customers and the diffusion of their own products/services. The following points are also worth noting:

1. relationship with institutions;
2. funding opportunities;
3. market features and
4. market opportunity research.

Fig. 3 - Exchanging knowledge and information about competence and best practice

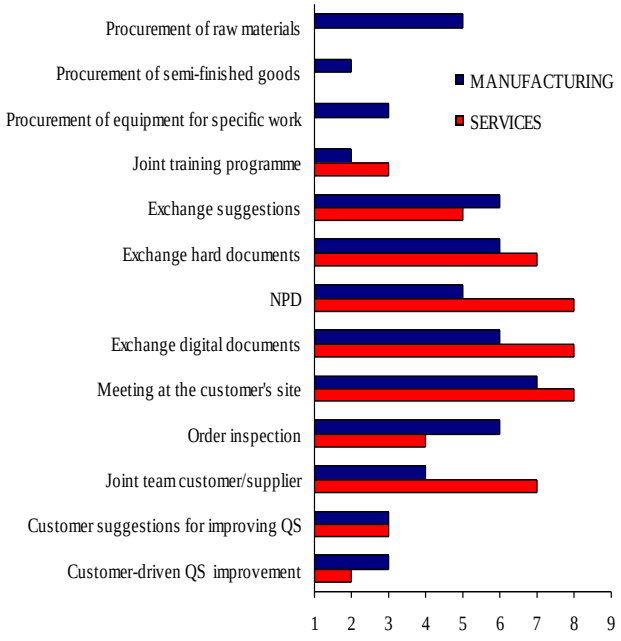
The first two points concern the relationship with local and central public authorities, not only as regards potential funding (especially forms of financing that cannot be accessed by sole application, but only through collaborations and partnerships), but also as regards initiatives to improve and renew the area in which most of the firms in the district are headquartered. Points 3 and 4 concern the relationship with the market, which is obviously an essential factor for firm survival. What appears high is especially the interest in sharing those market opportunities that can be captured only through forms of collaboration as well as in investigating how to do business with possible target customers.

Finally, the key points currently identified to create a platform to manage and share knowledge among firms of the ENS are as follows:

- the two-fold purpose of the inter-firm connection system consisting of an infrastructure for the internal pooling of knowledge, skills, expertise and *best practices* (B2B relations) and another for the interaction with the end consumer market (B2C relations);
- the need to have a central actor, inside or outside the group of firms in the district, who can optimally coordinate and manage the interface platform between firms;
- the possibility of implementing a system of egalitarian sharing P2P.

Figure 4 refers to the channels through the relationship with customers is played out, whose relative importance is indicated by values from 1 to 9. Of course, the first three channels refer only to the case of manufacturing firms (blue), while the others are also used by service companies (red).

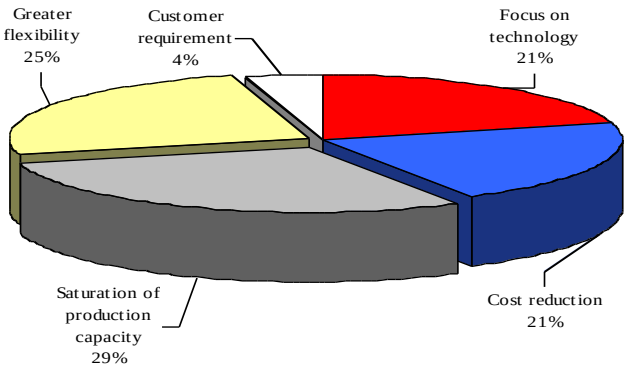
Fig. 4 - Relationship with customers



Great importance in the district (especially for service firms) is attached to meetings at the customer's site, to the exchange of computer documents and collaboration for new product development (NPD). Lastly, the importance of the channel used for customer relationships shows the value of people in inter-firm cooperation. It is people who are an essential factor to eliminate ambiguity of data that are transmitted physically or by means of ICT, and people who create the necessary confidence to obtain a collaborative environment. In the ENS, use of outsourcing accounts for as much as 25% of turnover, given that we are dealing with SME sub-suppliers (except for Vulcan Air and K4A). Another significant fact is that, out of the total of the parts/processes outsourced, only 32% is deemed of little importance to the value formation of the product supplied.

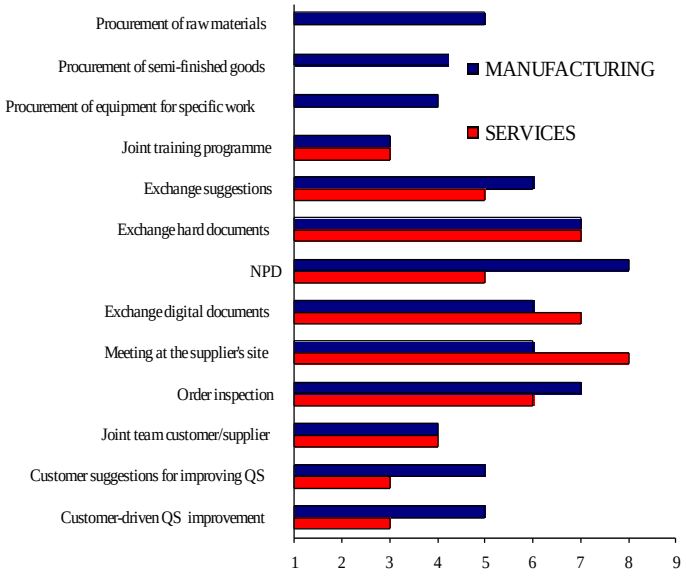
Fig. 5 shows the main motivations for outsourcing on the part of manufacturing firms. As may be noted, the main cause of outsourcing is the saturation of production capacity. The firms have calculated that they can attain better economic results by outsourcing part of their production process rather than by adding to human resources and machinery. Another important cause is achievement of production flexibility which allows them to capture various business opportunities at the same time. This is an essential element especially for those firms operating in only one type of business which does not guarantee survival, as often occurs for SMEs in high-tech sectors.

Fig. 5 - Outsourcing reasons



The relative importance (indicated by a score between 1 and 9) of channels for relationships with suppliers is reported in figure 6.

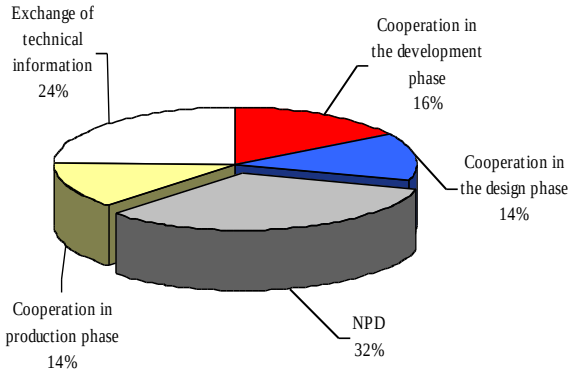
Fig. 6 - Relationship with suppliers



Also in this case, the first three channels refer only to the case of manufacturing firms (blue), while the others are also used by service companies (red). The weight of the channel *semi-finished product* (perceived importance: 5) gives a measure of the interest of enterprises in flexibility, exploiting the competences of third firms through work that would entail serious costs if it was inserted into the in-house production process. Of great importance are the following channels: *new product development programmes* (NPDs), *meetings at the supplier site and order progress control.*

Figure 7 refers to the nature of the relationships undertaken by ENS firms. The most common form of cooperation takes the form of participation in shared new product development programmes (32%). Sub-supplying relationships account for only a limited percentage (14%).

Fig. 7 - Nature of relationship



V. CONCLUSION AND IMPLICATION

It can be inferred from the survey results that the lack of a large leader firm means that the ENS cannot evolve towards the EE model. Nevertheless, it may be ascertained whether the ENS firms can evolve towards one of the other two models considered above.

As regards evolution towards the CL, the ENS displays the embryonic features of this model. On this point, we may identify some of the model's salient features, which may be found in the ENS, namely:

- the presence of economies of urbanisation;
- the possibility of benefiting from localisation economies;
- the possibility of easy and frequent interaction with customers both within and outside the district;
- the presence of a specialised labour pool;
- development of interdependencies among firms;
- exchange of information and knowledge among firms.

However, the absence for the moment of a real key actor in the ENS is a great limit to achieving this inter-organisational pattern.

Of the inter-organisational patterns described above, the *VE* is the closest to the forms of collaboration undertaken between firms in the ENS. Martinez et al. (2001) state that to give life to a VE the firms concerned must have the following characteristics:

1. a shared business culture, a fundamental prerequisite to develop cooperation. This should allow partners, initially, to "speak a common language" and then to work actively together;
2. an orientation to processes combined with a high capacity to cooperate, to focus strictly on the core business and on key interests in developing critical knowledge and skills.

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