

WHEN ENTREPRENEURS TELL THEIR INNOVATION HISTORIES: THE ROLE OF CRITICAL RESOURCES IN THE INNOVATION PROCESS IN SMES

by *Guido Capaldo, Lelio Raffa, Pierluigi Rippa**

1. Introduction

In last few years many researchers have focused their attention on the problem of the definition and analysis of the capabilities of Small and Medium Enterprises (SMEs) for planning and undertaking successful innovations (Branzei, Vertinsky, 2006; Freel, 2005; Wiklund, Shepherd, 2005).

One of the main approaches is the attempt to discover which factors contribute to the innovative efforts of SMEs and thereby determine the processes and behaviour behind successful innovations. These may then be used to indicate best practices for the development of innovations in SMEs (Keizer *et al.*, 2002).

It is often not easy for entrepreneurs of Small Businesses to find the correlation between the success of an innovation and the effort made during the planning, development and realisation of the innovation. It is therefore difficult for them to pause and answer questions of the type "What specific elements have contributed to conceiving, developing and carrying out innovations in my business? How important was my intuition? My professional preparation? My experience in the sector?", "What was the role played by my collaborators, their technical expertise, their commitment to the enterprise, their motivation?", "In what way did the organisational system of the enterprise facilitate the development of the innovation? For what reasons?", "How important were relations with actors external to the enterprise (e.g. suppliers, clients, business associations, universities and research centres) for the success of the innovation?". Besides, the daily

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pressure of the activity relating to the operational management of the business, the many day by day problems to be resolved and the necessity of always looking ahead so as not to be excluded from the competitive context, often mean that the entrepreneur does not have time to reflect on such questions.

However, in this way the "history of the innovation" slowly becomes more and more "out of focus", fading with time and not solidifying in the organisational memory of the business. The "rules" for the success of an innovation remain confined, therefore, within the "tacit" knowledge of the entrepreneur, and are not made explicit and transferred to the other members of the organisation.

If, instead, the entrepreneur is stimulated to reconstruct the history of the successful innovation, to reflect on what resources determined the success of the innovation, what problems it was necessary to face and how these were resolved, these elements may provide the basis for developing a process of organisational learning able to help the entrepreneur and his collaborators understand how to manage the development and realisation of new successful innovations.

Considering the above issues, the authors propose a methodology aimed at helping the entrepreneur to reconstruct the history of the principal innovations undertaken by his enterprise and to bring to light the way in which his skills, those of his collaborators and the possible collaboration with subjects external to the enterprise have contributed to the success of the innovations.

The methodology was developed by a work group composed by:

- researchers from the Department of Business and Managerial Engineering of the University of Naples, Federico II;
- experts from Cesvitec (Centre for the promotion and technological development of small and medium enterprises in the South of Italy);
- representatives of the Business Associations.

The different backgrounds of the components of the work group permitted continual and effective exchange of opinions between the world of enterprise and the world of research. The methodology was developed over several meetings, during the course of which the researchers illustrated their methodological proposals, which then passed to the scrutiny of the representatives of the world of enterprise. This way of operating made it possible to develop a methodology which is both scientifically structured and adjusted to the specific settings of Small Businesses.

The following sections, having described the theoretical premises of the research, illustrate the proposed methodology and the results of its application in the context of five Italian Small Firms. These are followed by managerial and methodological implications, as well as the possible future development of research work.

2. Theoretical premises

The methodology was developed on the basis of the following theoretical premises taken from the literature on the subject of innovation in SMEs:

1. *The central role of the entrepreneur in the management of innovation in SMEs:* in small innovative businesses the innovative process starts from the entrepreneur's perception of changes in the settings, as well as from the way in which, given such changes, it is possible to create opportunities for diversification of processes, products and markets. The innovative entrepreneur considers innovation as an opportunity for the development of the enterprise and not as a rule for survival (Hoffman *et al.*, 1998; Raffa, Zollo, 2000);

2. *Resource-based approach:* innovation capabilities in SMEs are strictly connected to the kind and the amount of specific resources entrepreneurs are able to acquire, develop and manage in the course of a company's lifetime (Amit, Shoemaker, 1993; Barney, 1991; Grant, 1991; Rumelt, 1984);

3. *Fuzzy organisational boundaries of SMEs:* small businesses, more than large ones, depend on the context in which they operate. In most cases the boundaries of the enterprise are fuzzy and indefinite: unlike large businesses, small businesses do not enjoy self-sufficiency independent of the external environment. They lack an "internal environment" which can give them intrinsic autonomy. This situation is largely due to the very absence of formal organisational structures, usually implemented to sustain pathways of autonomous evolution and innovation, and to the need of recurring to the outside to acquire the professionalism and abilities that are necessary to carry out service activities (Raffa, Zollo, 2000);

4. *Process perspective for understanding innovation in SMEs:* analysis of the innovation capabilities of SMEs requires analysis of the processes through which innovation emerges and the contextual characteristics of the processes (Edwards *et al.*, 2004; Hoffman *et al.*, 1998; Raffa, Zollo, 2000; Keizer *et al.*, 2002).

From these premises, the following useful implications for the construction of a methodology aimed at representing the innovative efforts of SMEs have been deduced:

1. *Centrality of the role of the entrepreneur in the management of innovation in the SMEs:* in order to shed light on the factors which may explain the innovative efforts of SMEs, it is necessary to consider the history of the enterprise and of its entrepreneur. Through the reconstruction of such a history it is possible to rebuild the strategic vision of the entrepreneur over time, the way he perceived the different changes in the settings and the way he interpreted them so as to use them as an opportunity for the development of successful innovations;

2. *Resource-based approach:* innovative efforts may be represented by analysing how the entrepreneur's capability for the development and im-

provement of his own resources (experience, know-how, strategic capacity, etc.), of the capabilities of his collaborators and of the organisation all vary over time, and how he combines such resources in an effective way;

3. *Fuzzy organisational boundaries of SMEs*: internal resources do not suffice when identifying resources supporting innovative efforts in SMEs. External resources have to be considered carefully. These include relationships with customers, suppliers, universities, research centres, etc.

4. *Process perspective for understanding innovation in SMEs*: a central issue in the explanation of the innovative efforts is the analysis of the entrepreneur's capabilities in selecting and combining internal and external resources.

3. Methodology: Phases, aims and description

The aims of the methodology are to help the entrepreneur to reconstruct the history of the principal innovations undertaken by his firm and to bring to light the role that his capabilities and those of his collaborators, as well as the possible relationships of collaboration with subjects outside the enterprise, have had in the success of the innovation.

The ultimate goal is to identify the specific typologies of resources activated by entrepreneurs to develop and support the process of innovation, and the successful innovative behaviour which, appropriately generalised, may act as a stimulus for entrepreneurs and their innovative behaviour in other sectors.

As mentioned in the preceding paragraph, the methodology is the result of the joint work of a research group composed of university researchers and representatives of business associations.

The methodology was developed in the phases illustrated in Table 1.

Tab. 1 - Phases of the proposed methodology

Phase	Methodology
1. Reconstruction of the history of the firm and the entrepreneur	Face to face interview with the entrepreneur making annotations on a check list
2. Identification of the resources which enabled the development efforts for each innovation	Interview with the entrepreneur Analysis of the interview text following the techniques of discourse analysis Identification of the resources supporting the innovative efforts
3. Verification of the results of the analysis	Agreement, on the part of the entrepreneur, on the results of the analysis concerning the resources activated for the success of the innovations

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4. Analysis of the results	Comparison of case studies analysed for the definition of best practices in the processes of innovation
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The first phase of the research work was represented by the interview with the entrepreneur. The interview was conducted putting emphasis on the narration of the history of the entrepreneur and its enterprise.

The interviews were aimed at revealing elements for reconstructing the innovations realised by the enterprises. The interviews lasted not less than half a day and, in some cases, were conducted in more than one session. In this phase the interviewers left the entrepreneurs completely free to narrate their own histories and those of their firms, using a checklist for information gathering. The interview therefore consisted in “listening to the account of the history of the firm and of the entrepreneur”.

The final result of this phase did not merely coincide with the histories of the enterprises and the entrepreneurs, but also with those of the main innovations (in terms of both processes and products) carried out during the company’s lifetime.

Tab. 2 - Categories of variables explaining innovative efforts in SMEs

Macrovariables	Variables	Attributes	Authors
Resources of the Entrepreneur	Entrepreneur’s know-how	Experience in the sector, training, further knowledge	Man et al., 2002; O’Regan, 2006; Van Gils, 2006; Drucker, 1986; Virtanen, Kosky, 1997; Harris, Ogbonna, 1999; Hoffman et al., 1998; Hausman, 2005; Freel, 2005
	Entrepreneur’s inclination towards individual retraining	Inclination towards attending training courses Propensity to take part in the life of the business associations	Man et al., 2002; O’Regan, 2006; Bagchi-Sen, 2001
	Strategic and business development skills	Ability to analyse the dynamics of the sector, capability of market diversification, knowledge of strategic choices	Miller, Toulouse, 1996; Dou, Dou, 1999; Man et al., 2002; Hurley et al., 2004; Savioz et al., 2002; Wiklund et al., 2004; Carrier, 1994; Birchall et al., 1996; Le Bars et al., 1998; Marriott et al., 2000; Bagchi-Sen, 2001; Freel, 2005
Resources of the collaborators	Employees’ know-how	Experience in the sector, training, further knowledge	Bougraine, Haudeville, 2002; Docter, Stockman, 1988; Freel, 2005; Capecchi et al., 1990; Grotz, Braun, 1993; Branzei, Vertinsky, 2006

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Management and organisational resources	Organisational skills	Formalisation and knowledge of individual roles and responsibilities, coordination skills	Christensen, 1997; Keogh, 1999; Ahuja, Katila, 2001; Dobni, 2006 Simonin, 1997; Keogh, 1999; Calantone et al., 2002; Calaghirou et al., 2004; Weerawardena et al., 2006; Akgun et al., 2007; Garcia-Morales et al., 2007
	Managerial skills	Planning and control of management, supplies management, management and development of human resources, quality control management, IS	Edwards et al., 2005; O'Regan et al., 2006; Branzei, 2006; Diercks et al., 1999; Dou, Dou, 1999; Ferneley, Bell, 2006; Kohn, Husig, 2006
	Research and development	Entrepreneur's inclination towards investments in R&D, Human resources employed in R&D, etc.	Bougraine et al., 2002; Hoffman et al., 1998; Keogh, 1999; Calabrese et al., 2002; Freel, 2005; Docter, Stockman, 1988; Storey, 1994; Laitinen, 2002
Network resources	Capacity of horizontal relations	Commercial agreements with other enterprises, collaboration of various types with other enterprises	Edwards et al., 2005; Freel, 2005; Novelli et al., 2006; Le Blanc et al., 1997; Diercks, 1998; Le Bars et al., 1998; Keogh, 1999; Bagchi-Sen, 2001; Hoffman et al., 1998; Kaufmann et al., 2002
	Capacity of vertical relations	Capacity to create and take part in networks which include supplier and /or client companies	Lipparini, Sobrero, 1994; Kaufmann et al., 2002; Calaghirou et al., 2004; Edwards et al., 2005
	Use of external knowledge	Collaboration with centres for the spread of knowledge, propensity to collaborate with research centres	Nonaka, Takeuchi, 1995; Le Bars et al., 1998; Oerlemans et al., 1998; Bougraine, Haudeville, 2002; Keizer et al., 2002; Edwards et al., 2005; Diercks, 1998; Oerlemans et al., 1998; Bessant, 1999; Kaufmann et al., 2002;
	Use of subsidies for innovation	Effective use of supporting financial resources or laws	Bagchi-Sen, 2001; Kaufmann et al., 2002; Keizer et al., 2002; Edwards et al., 2005
	Propensity to acquire and use innovative ideas	Use of instruments for the collection of innovative ideas coming from the market	Zahra et al., 1993; Calabrese et al., 2002; Calaghirou et al., 2004; Kaufmann et al., 2002; Le Blanc et al., 1997

In the second phase, the researchers brought to light the main categories of resources able to explain the innovative efforts of the SMEs for the success of the innovative processes. These categories, listed in Table 2, result from an extensive bibliographical research work carried out by researchers and from the experience of representatives of the entrepreneurial sector. The outcome of these interactions is a list of the resources (macrovariables),

each having several sub-variables so as to identify appropriate indicators for their measurement. The field investigation was carried out by means of questionnaires, where the values of the four main categories of resources under investigation were annotated.

Data collection and analysis followed appropriate methodologies of discourse analysis (Iandoli, Zollo, 2007), with the objective of attributing a synthetic numerical value to each macrovariable.

The history of the enterprises, the entrepreneurs and the principal innovations undertaken during the enterprises' lifetime was thus reconstructed. Later the interviews focused on the identification and analysis of the main innovations realised over the last few years. During the interviews, a series of useful information for evaluating the level of importance of the four types of resources for the success of the innovation (scored on a numerical scale from 1 to 5, where 1 mean low level, 3 medium level, 5 high level) was determined for each innovation. The attributed value was the result of the analysis of the comments supplied by the entrepreneurs, in some cases being explicitly suggested by the entrepreneurs themselves, in others found through the re-reading of the interview texts. The results from this phase provided the basis of the first research reports.

In the third phase, the research group met the entrepreneurs once again in order to examine the contents of the reports and to verify whether the 'snapshots' of each enterprise, entrepreneur, principal innovation and relevant resources were sufficiently agreed on by the individual entrepreneurs and considered representative of the situation as they perceived it.

This was a particularly interesting and rewarding phase for the work group: both the 'snapshots' of each enterprise and entrepreneur and the 'snapshots' of the history of the innovations were generally agreed on by entrepreneurs, though sometimes a little 'adjustment' was necessary.

Finally, on the basis of the entrepreneurs' observations, final reports were produced, through which the research group was able to carry out analyses of the contexts for evaluating the evolution, over the years, and therefore over the different innovations, of the contribution given by the various resources to the innovative processes. These reports showed a constant growth trend in the variables representing network resources, management and organisational resources and the resources of the collaborators. However, such growth was not compensated by a decrease in the role of the entrepreneur who, rather, is in the front line in every innovative process. As shall be illustrated by the data, what emerges is a new role played by the entrepreneur: from being the innovator in the enterprise's first years of life, he progressively takes on the role of coordinator of the company resources for achieving success in innovative processes.

The main results of the research work are illustrated in the following section.

4. The sample

The described methodology has been applied in a sample of 5 innovative small firms. The selection was based on the following criteria:

- undertaking of radical innovations involving significant changes in the performance of products and processes with respect to what was offered by competitors, and which resulted into substantial improvements in the company's competitiveness (Verganti *et al*, 2006);
- absence of resources devoted exclusively to research and innovation;
- entrepreneur's orientation towards innovation;
- relations (also at informal level) with possible sources of external knowledge and orientation to interact with them;
- time to devote to the interview.

At the end of the selection process, five successful firms were selected and their entrepreneurs interviewed.

Table 3 provides a summary of the enterprises according to: their dimension; their average turnover in the last three years; the sector in which they operate; the territorial catchment area of their user base; the modality through which they relate to the external market (clients and suppliers); and the geographical market of reference.

Tab. 3 - The sample of the study

Enterprise	Dimensions	Average turnover	Sector	Relation with clients and suppliers	Geographical market
Company One	About 30 employees	About 1 million €	Car body shop	Caserta and its province. Direct relation with clients and suppliers	Province of Caserta
Company Two	About 24 employees	About 3 million €	Bar apparatus/ machinery	Direct market, without intermediaries	Italy and Abroad
Company Three	About 70 employees	About 30 million €	Foodstuffs	Direct relation with clients and suppliers	Region of Campania
Company Four	About 65 employees	About 500,000 €	Bookshop	Through channels of indirect sales	Italy and Abroad
Company Five	About 12 employees	About 1 million €	Foodstuffs	Channels of direct sales	Italy and Abroad

5. Results

The results of the analysis concerning five firms are reported below. Each case is introduced by a brief profile of the company, followed by the list and the description of the leading innovations undertaken during the enterprise's lifetime.

For each case, the first profile of the company was outlined on the basis of the use and consultation of multiple sources (company documents, internet web sites, analysis of available information found in the business associations for the category of company). The result was a first description of the enterprise (general data about the enterprise; history of the enterprise; dimensions, products / markets, etc.). In particular, as shown in Table 3, the following data were reported: number of employees; average turnover of the last three years; sector; product distribution; market of reference.

5.1 Company One

Company One was started up in 1968 as a family run garage with a few employees organised on the model of the Ford production line: each employee was assigned to a specific production process. Today the Company has more than thirty employees and a total surface of about 10,000 m², and an average annual turnover of 1 million Euros.

The founder of the Company started his own enterprise after having gained *many years of experience* in the workshops of a well-known Italian automobile industry. Thus, he had great experience and profound knowledge of all the internal and external processes of the world of car bodywork. From early on, he equipped his own garage with machinery unimaginable for the small businesses of the time: from the bench for aligning body shells to paint drying ovens, from tintometers to water based painting. An innovative spirit is to be found not only in the acquisition of innovative machinery, but also in the highly original set up given to the organisation. The *workflow is organised like a true production line*, where each employee is specialised in one sector of bodywork. Besides, as confirmation of its organisational capacity, the Company also has certificates of quality for its work processes and environmental certifications for the recovery and recycling of waste material. Today the business is managed by the sons of the founder, who, after finishing high school, entered into the heart of the work processes of the car body shop. The innovative spirit continued after the generational change and today numerous innovations, both in the processes and in the products of the Company, are being constantly introduced.

The analysis of the interviews given by the entrepreneur and the study of the (corporate and on-line) documentation enabled to reconstruct the role played by the four resources (identified in the previous section) in the

four innovations believed to be among the most significant ones undertaken by the Company in almost fifty years of activity.

The innovations examined are reported in Table 4.

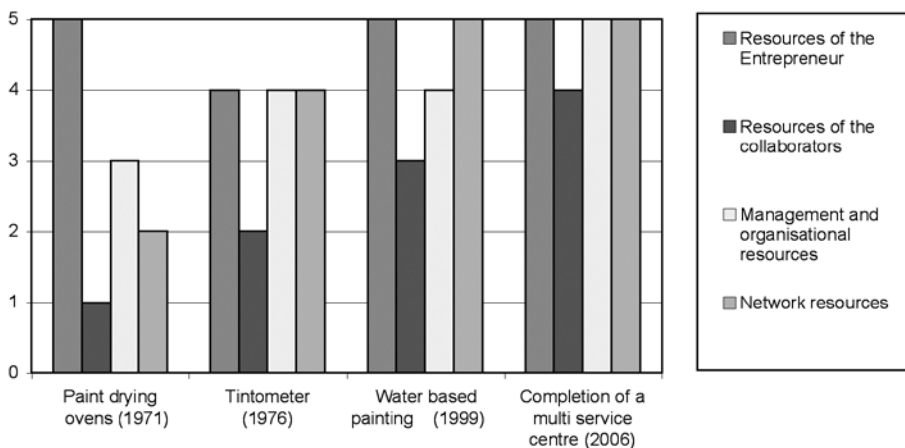
Tab. 4 - Main innovation of Company One

Typology of innovation	Description of the intervention	Year
Process innovations	Paint drying ovens	1971
	Tintometer	1976
	Water based painting	1999
Product innovation	Completion of a multi service centre	2006

One of the first innovations made by the Company was the introduction of paint drying ovens in 1971. This innovation was largely due to the *experience gained by the company founder* in earlier work contexts, and therefore represents a *fundamental element* in the process of acquisition of this innovation. The entrepreneur was able to introduce the innovation without generating resistance on the part of the employees. The introduction occurred without particular disruption, in that the production line organisation allowed the introduction of new processes without giving rise to criticalities. The knowledge of the entrepreneur also allowed activation of the right channels with the suppliers for the acquisition of the machinery.

In the light of the above observations, the first innovation had a *high value of entrepreneurial resources*, whereas the contribution supplied by the network resources was medium and that offered by internal resources (i.e. collaborators) and by the management and organisational resources were medium-low (Figure 1).

Fig. 1 - Level of activation of the resources for innovation in Company One



The knowledge and experience of the entrepreneur provided the impulse towards the acquisition of the tintometer (the second type of innovation being analysed). The entrepreneur was also able to introduce this innovation *without generating resistance* on the part of the employees, though they were more involved in training courses to learn the techniques for using machinery which, especially for a small enterprise, was *extremely innovative* at the time. It was therefore important to activate *managerial and organisational capacities* in order to guarantee the introduction of a revolutionary process (especially from the technological point of view). Finally, the activation of *contacts with the suppliers was crucial* for the success of the innovation, in that they acted to guarantee training in the use of the new machinery for the spray painting of cars.

On the basis of the above observations, the bar chart relating to the second innovation (see Figure 1) presents, also in this case, medium-high values for all the resources with the exception of internal ones.

The third innovation examined is the water-based painting technique, introduced into the enterprise a few years before the enforcement of the law on car paints which made the use of water-based solutions mandatory. The *knowledge and the expertise gained by the entrepreneur*, especially following trips abroad, represented a *fundamental aspect* in the acquisition of this innovation. The entrepreneur was able to introduce the innovation without generating resistance on the part of the employees, whose greater involvement was - once again - necessary in terms of participation in training courses. It was extremely important to activate *managerial and organisational capacities* so as to guarantee the introduction of a new and technologically evolved process like water-based painting. The activation of contacts with the suppliers was of great importance for the success of the innovation, in that this guaranteed training in the use of new machinery for colour painting of cars.

The third section of Figure 1 shows the activation levels of the resources for the introduction of the water-based painting in the Company. Again, the capacities of the entrepreneur proved decisive and crucial (this time coupled with the managerial and organisational resources), while the contribution of network resources and internal resources was, respectively, medium-high and medium.

With reference to the last innovation under investigation (the multi-service centre), the entrepreneur's capabilities were once again fundamental as he was able to interpret in advance the evolution trends within the sector. These trends moved towards concentrating within a single structure different processes connected to the world of motorcars (from repair estimates for insurance, to painting and mechanical repairs, from breakdown assistance to trade agreements with important car manufacturers). In the expansion process of the productive activity, the constant growth of internal professional competencies also enabled to expand the range of prod-

ucts offered by the enterprise to services that were collateral to the repair of vehicles. Besides, the realisation of a multi-service centre could not come about without an efficient and perfectly functioning management and organisational system. Lastly, the relations with customers and suppliers were fundamental for guaranteeing a service able to satisfy not only the needs connected to the repair of cars but also to supply all-round assistance.

The last bar chart in Figure 1 illustrates the activation levels of the resources, which are also in this case high for all the categories, with a slightly lower value for internal resources.

5.2 Company Two

This second company operates in the sector of crushed-ice machines and cold drinks vending machines. Founded in the 1960s, today it has a total of 25 employees and an average turnover of about 3 million Euros. Its production is aimed at a prevalently Italian market (about 80% of the production), while distribution abroad mainly targets EU countries and North America.

In the 1960s, the founder decided to *start up* a business activity for the commercial distribution of bar, restaurant and hotel equipment. The history of the Company immediately stood out as innovative, also following the launch of the first vertical-axis crushed-ice maker into the market. Later on, also when the direction of the enterprise passed to the son of the founder, the Company continued to distinguish itself for its *capacity of introducing into the market new and highly innovative products*, both for their design and technological features.

The current entrepreneur bases his own capacities both on the studies carried out, on his own interests and on the fundamental experience gained at the company of his father, the founder, where he covered roles of all types, from the most operational to administrative ones.

The innovations analysed in the case study are the four believed to be most significant, as shown in Table 5.

Tab. 5 - Main innovations of Company Two

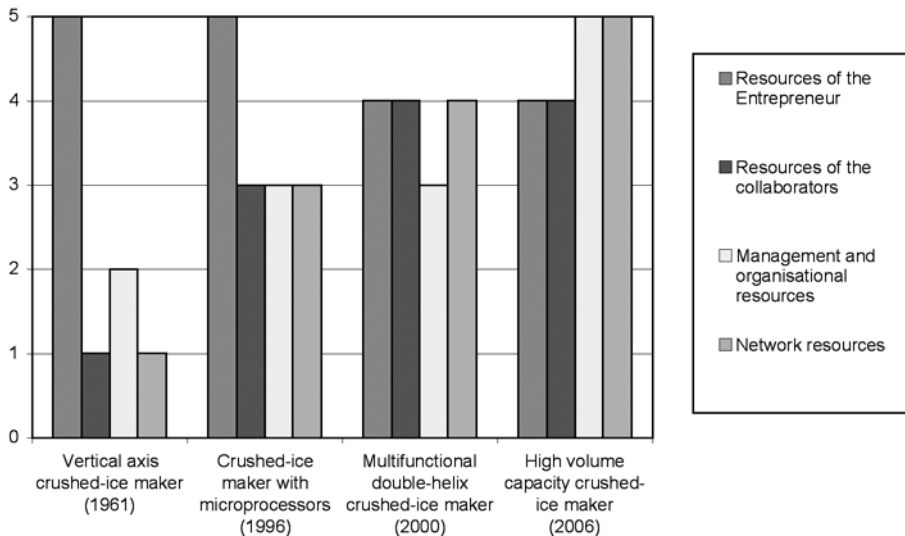
Typology of innovation	Description of the intervention	Year
Product innovations	Vertical axis crushed-ice maker	1961
	Crushed-ice maker with microprocessors	1996
	Multifunctional double-helix crushed-ice maker	2000
	High volume capacity crushed-ice maker	2006

The first innovation in the history of Company Two may be traced to 1961, when the first vertical axis crushed-ice maker was marketed in Italy. The founder of the Enterprise made this possible as a result of the skills

and know-how in mechanics and assembly which he had matured from his studies and first professional experience. The *role of the internal resources* was limited, since the Entrepreneur represented, and identified himself with, the Company. The customers offered the impetus for the initial idea and then a *relationship with the suppliers* of mechanical parts for coffee machines was established to verify which components to use and in which way. The company structure, in as much as it was assimilated to the entrepreneur, determined a limited contribution from a managerial and organisational standpoint.

The bar chart in Figure 2 shows the *roles played by different resources* for the success of the innovation under examination. In the light of the points highlighted above, the role of the entrepreneur's resources is preponderant, while the contributions offered by other categories are low.

Fig. 2 - Level of activation of resources for innovations in Company Two



The later innovations which shall be described were all undertaken by the current entrepreneur (son of the founder). The 1996 crushed-ice maker with microprocessors was the first ice-maker with a high technological content. The entrepreneur's training encompassed a basic knowledge of electronics, which gave him a clear understanding of the possible use of this technology in the sector of ice-makers. Also due to the to the commitment of the planning department, 3D design and all the computer design techniques in use today were successfully introduced into the company. The *innovation was introduced in a gradual way* into the market so as to reduce the risk of wasting a valid, but in any case innovative, product. Besides, a planning process was forming and the development times became notably

shorter, from 5 to 2 years. The strong links with the suppliers enabled to finalize a product with a high electronic content.

The bar chart in Figure 2 illustrates the contribution offered by the resources to the success of the innovation. The entrepreneur's contribution is high, while other resources remain of medium relevance.

In 2000, following analysis of the problems relating to ice-makers on the market, the multifunctional ice-maker with double helix came about. The old horizontal machines forced the holding gaskets of the motor, which required more frequent maintenance than the vertical model. The idea arose of making a machine that worked with both a vertical and a horizontal axis in order to divide the forces in a uniform manner and thus reduce the wear on components.

It was from the activity of maintenance on crushed-ice makers with microprocessors that the idea of making a multifunctional ice-maker with double helix arose. In particular, the work carried out by the *design department* led to the definition of the new product's layout and working mechanism.

In this case, the *network resources* did not cover a fundamental role in implementing this innovation, although the partnership link previously activated by the Company represented an asset for the realisation of a successful product. Lastly, the work carried out by the design department was fundamental in making constant incremental improvements to the products. This work was also undertaken with the final aim of issuing a manual including all the best practices to be followed, as well as the errors to be avoided, in order for the company to achieve success in this key activity.

The bars in Figure 2 show the *contribution offered by the four resources* under examination on the basis of the above considerations. The contribution of all the resources is medium-high, with the exception of the network resources, whose level of importance (though crucial) ranks just below the other three.

With reference to the last innovation (high volume crushed-ice maker, 2006), the *organisation and rationalisation of the planning process* proved fundamental and was guaranteed by the competencies and the know-how developed by the entrepreneur.

In this case, the *impulse towards innovation* came from an idea of a client, who had expressed a specific need to the Company. Therefore the client was the principal source of this innovation. Lastly, with the support of the new software, business procedures and the work of collaborators, in twelve months the project was designed and a prototype was completed and manufactured.

The bars in Figure 2 show the activation level of the resources, which is obviously high for the network resources, and in any case high and medium-high for the remaining ones.

5.3 Company Three

The origin of the Company Three may be traced to the end of the 19th century,

to the start of a flourishing company which has now reached production levels able to turnover an average of 30 million Euros per annum. The company, with a current organisational structure of about 70 employees, operates in the production of condiments and seasoning products that are mainly exported.

The current entrepreneurs represent the fourth generation of a family which has always distinguished itself on the market for its innovative spirit. Their *heterogeneous professional trainings* has, perhaps, been one of the elements on which the success of this Company was grounded. Today the three brothers, with different educational backgrounds (medicine, pharmacy and economics), manage the Company jointly and always agree on the best strategic choices. Currently, the three brothers all work in the company in different roles. However, each of them has the chance of launching initiatives in which he believes. In fact, if convinced of the project's validity, the other brothers grant him the project leadership. This project-based organisation enables to maintain the entrepreneurial spirit which, in different ways, is shared by all the members of the family.

The innovations which have been examined with the entrepreneurs, and which shall be analysed in the following sections, are reported in Table 6.

Tab. 6 - Main innovations of Company Three

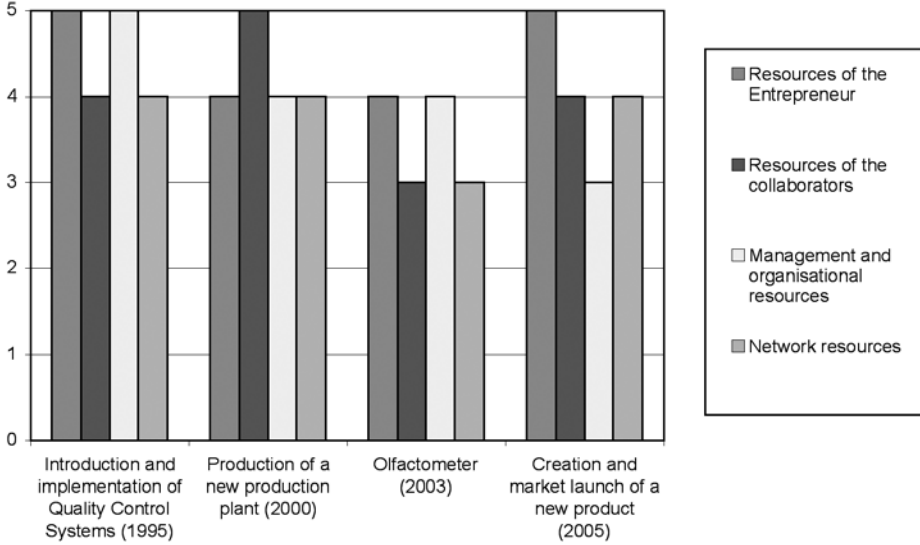
Typology of innovation	Description of the intervention	Year
Process innovations	Introduction and implementation of Quality Control Systems	1995
	Production of a new production plant	2000
	Olfactometer	2003
Product innovations	Creation and market launch of a new product	2005

The intention and will of the entrepreneurial group to *uniform internal procedures and formalise the control systems* in order to improve the quality of the products and services, as well as the availability to make investments, the attention towards clients' requests and the capacity to motivate their collaborators, brought about the certification of the production process of the Company in 1995. The introduction of this certification undoubtedly represents an innovative aspect. In this respect, the willingness of the collaborators to learn the procedures of the Quality Control System led to the certification in a brief time. The capacity for *redesigning the internal procedures* and formalising the control systems to make them more compliant with the Quality Control System also represented critical elements for the realisation of this innovation. Lastly, collaboration with certification institutes and bodies allowed the Company to successfully re-plan the activity.

In the light of the above observations, Figure 3 shows the activation levels of the different resources for the realisation of the first innovation under examination. The contributions of all four resources analysed are high or medium-high.

The creation of a *new production plant*, with the scope of increasing the productive capacity as well as the possibility of expanding in Italy and

Fig. 3 - Levels of activation of the resources for innovation in Company Three



abroad, is due to the intuition of the entrepreneurial group. They made use of *technical experts able to carry out the planning and realisation of the plant*, while the *internal resources* were able to use the new plant better and more rapidly. Lastly, the collaboration with the producers of machinery and with local building firms proved efficient.

Figure 3 provides a graphical outline of the level of activation of the resources in realising the innovation under examination.

The entrepreneurial resources, the capacity to work jointly and the organisational and managerial resources were medium-high, while the capacity of collaborators to deal with the organisational impact of the plants and the production capacity was fundamental.

In 2003, the Entrepreneurial Group - fortified by years of experience in the sector and confident about the need to propose a differentiation to the end-user - understood the importance of offering a product whose characteristics could be objectively identified by means of scientific analysis. They managed to identify *research centres* having the right competencies for undertaking the project, in that a strong phase of scientific research was required to identify the organoleptic features of the product. The ability to realise an olfactometer within a shorter time span and at lower costs *vis-à-vis* the initial plans was due to the high project management skills. The suggestions provided by sales personnel and personnel of the *Research and Development Centre* of the company to the entrepreneurial group were critical in

the project phase for experimentation of the system. In this phase, the collaboration with the Universities and the Research Centres proved effective.

The graphical outline in Figure 3 shows the level of activation of the resources, which, on the basis of what has been stated above, show medium-high values for *entrepreneurial resources and network resources* (considering the research and development phases), while collaborators and management and organisational capacity offered medium contributions to the innovative process.

The last innovation to be examined is the *launch of a new product on the market*. The entrepreneurial group worked to explore and create new possibilities to differentiate the products and make it more 'attractive' to different target consumers. Through extensive market analyses, a new product was designed. The flexibility of the personnel to rapidly adjust to the new production process, the *capacity to coordinate* an in-depth study of the different packaging methods of the new product (working in close contact with the suppliers), the *ability to finalize the new product* in 12 months as well as the realisation of new commercial and marketing policies guaranteed the success of this innovation.

These elements are summarised in Figure 3: as far as this innovation is concerned, the elevated entrepreneurial capacity had to be flanked by the medium-high capacity of collaborators and of management and organisation, while the contribution of the network resources was medium.

5.4 Company Four

Company Four started in the first half of the last century and today has about 65 employees for an average annual turnover of about 500,000 Euros. It mainly operates on the local market (through direct sales), though the editorial production is clearly receptive to novel ideas coming from the entire Italian peninsula. The *current entrepreneur represents the last generation* of booksellers and publishers which, over the decades, have always known how to innovate and to confront the arrival on the market of the great publishing multinationals. The company's entrepreneur entered the bookshop business in the 1970s at a young age - even before graduating in Economics - and carrying out a series of duties in the areas of commercial processes, relations with suppliers and administrative processes.

The principal innovations analysed are reported in Table 7.

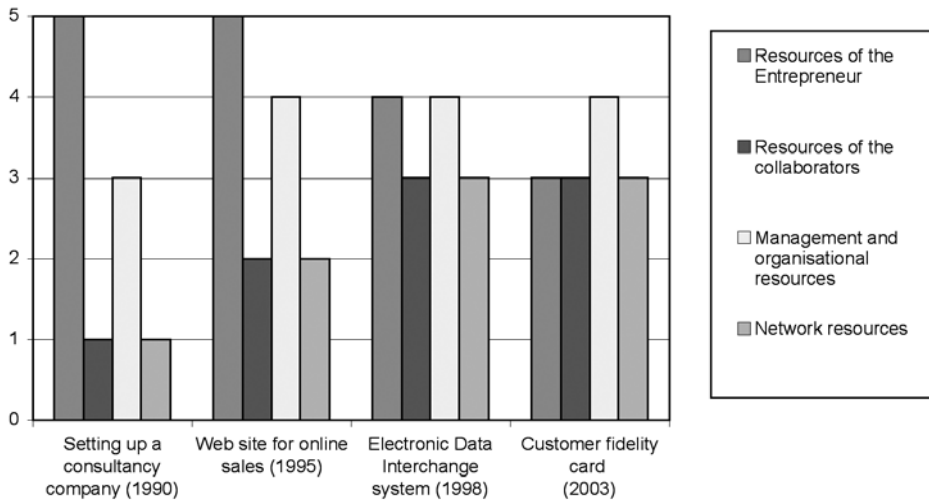
Tab. 7 - Main innovations of Company Four

Typology of innovation	Description of the intervention	Year
Process innovation	Setting up a consultancy company	1990
	Web site for on-line sales	1995
	Electronic Data Interchange system	1998
	Customer fidelity card	2003

Since 1988, the Company has passed through various *stages of computerisation*. In 1990, to strengthen its own innovative strategy, the company underwent a significant *organisational and process innovation* with the setting up of a company specifically dealing with the management of innovations concerning information technology. This idea stemmed from the personal experience of the entrepreneur, with a view to using IT in the bookshop activity. Collaborators who lacked computer literacy participated in the process in a marginal way. The company started by exploiting the competencies of the entrepreneur, as well as the technological know-how of its suppliers. *External resources played an important role*, also given the relationship between Delta Bookshop and some important companies in the computing field.

Figure 4 summarises the role played by different resources in the realisation of this innovation, which was due, above all, to *strong entrepreneurial skills*, while the network resources activated were medium. Lastly, the contributions of the resources of collaborators and of management and organisation proved marginal.

Fig. 4 - Levels of activation of the resources for innovation in Company Four



The second innovation examined was the setting up of a web site for the bookshop in 1995. The *initial impulse* came from a personal interest of the entrepreneur, who, with his knowledge of the book sector, managed to imagine the possibility of innovative moves like on-line sales. The Company undertook the creation of a new channel for the sales of books. *Collaborators were involved in the constant updating of the computer system* concerning the availability of books. An important contribution was offered by the partner enterprise producing the software for the internal management of texts, while the archive of all the titles available was entrusted to an external provider.

This situation is represented graphically in Figure 4: the impact of the entrepreneurial resource is still strong and there is a wider use of the network resources. The contributions of *the internal resources and the management and organisational resources remain medium-low*.

In 1998, once more due to the innovative spirit of the entrepreneur, and yet again in the field of IT, a management network for the stores was developed through the Electronic Data Interchange system (E.D.I.). The project started from the entrepreneur's consideration of the benefits related to the application of a system addressing the pressing need to catalogue and store information to be made available to the enterprise's counterparts (end users, clients, distributors and publishers). The *knowledge acquired by the collaborators* through their experience in using the web site software facilitated the acceptance of the new IT system and encouraged a more efficient use. The innovation was also due to the *management and organisational procedures* existing in the company at the time of the introduction of the web site. The needs and feasibility study was carried out with the IT system supplier. A local software house worked on customising of the IT applications. Lastly, some partners, i.e. different Italian publishers, took part in the testing phase.

Graphically (see Figure 4), this system shows a medium-high activation of the network and entrepreneurial resources, while the managerial and organisational resources and the collaborator resources display medium activation.

The last innovative idea stemmed from the relations existing between the entrepreneur and some foreign companies, which made technology based on the chip card available to him. The *entrepreneur* acted in first person as the *manager and coordinator of the innovative process* among the different parties involved. The innovation became possible thanks to the knowledge acquired by the collaborators, and to the work of the 'internal' systems analyst of the Company, who also managed integration with the web site. To make the new service 'appealing' from a commercial point of view, the development of services offered were worked on as the innovation had to be linked into the current activity. Besides, the organisation enabled, rapidly and easily, the first testing of this functionality.

In Figure 4 the levels of activation of the different resources are represented. In this case, the role of the external resources was particularly relevant, while the contribution of the other three resources was medium.

5.5 Company Five

Company Five was founded in 1974 and entered the economic and cultural context of the Neapolitan pasta producers, undertaking production according to the oldest local traditions. Drawing on his experience in the field of catering, the founder decided to set up his own business. From 1974 to today, the Company has witnessed a constant increase in its average an-

nual turnover, number of employees and sales points. It has also started a process to diversify the products it offers and has opened full hotel resorts. Today it counts about 12 full time employees in pasta production alone, and has an average turnover of about 1 million Euros.

The current management, in the role since the late 1990s, is made up of the successors of the founder. Although the three brothers have different cultural backgrounds (economics, IT), they still manage to make their different responsibilities converge on a strategy aimed at constant innovation.

The innovations taken into examination refer to the second generation of entrepreneurs at Company Five, and are summarised in Table 8.

Tab. 8 - Main innovations of Company Five

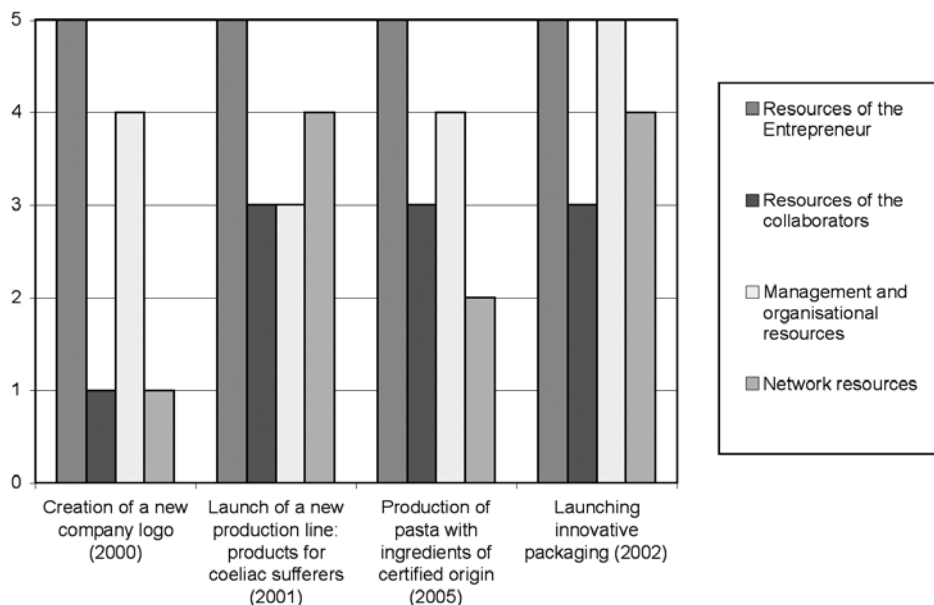
Typology of innovation	Description of the intervention	Year
Product innovation	Creation of a new company logo	2000
	Launch of a new production line: products for coeliac sufferers	2001
	Production of pasta with ingredients of certified origin	2005
Process innovation	Launching innovative packaging	2002

The first significant innovation undertaken by the Company was the change of the company logo in 2000: a clear sign of the will to give life to a new, *more dynamic and more innovative enterprise*. In this process, the studies followed by the three entrepreneurs represented key resources in the realisation of the new logo. The *ability to interpret the trends of a fluctuating market*, like that of pasta, was also fundamental for the strategic choice of the new logo. The *brothers' skills* in marketing and their experience in the computing sector and in the use of graphics programmes was flanked by a close link to an external graphics consultancy company.

Contributions from collaborators were almost imperceptible, while the managerial and organisational resources were never put to use.

The graphical representation in Figure 5 shows the levels of activation of the resources for the success of the innovation and reflects the above statements. The innovation is due to the *entrepreneurial capacity and to the network resources*, which were attributed high and medium-high levels, while the contributions of the other resources analysed were low.

Fig. 5 - Levels of activation of the resources for innovation in Company Five



In 2001, in response to a clear request of the market, the production of pasta and cakes for coeliac sufferers was set up inside the Company's pasta production plant. The entrepreneurial group's ability to identify a market sector that was still 'free' allowed the Company to set up an activity which today has a very high level of production. However, it was necessary to activate *managerial and organisational resources* (since a new production plant with new machinery was needed) and, to a minor extent, internal resources, also given the necessity of defining a new organisation of the work and new responsibilities. Even more relevant and crucial was the *connection between the entrepreneurial group and the Italian coeliac disease association*. This relationship allowed the Company a better understanding of coeliac disease and, as a consequence, the realisation of a line of products that would fully meet the needs of coeliac sufferers.

The above framework is graphically illustrated in Figure 5: a *clear predominance of the entrepreneurial resource*; a medium-high level in the management and organisational resources; a medium activity of the resources of the network and of collaborators.

The *capacity of reading market trends*, the expertise matured by the entrepreneurial group through the participation in fairs and events in the sector, as well as the constant trips in Italy and abroad, brought about the third innovation, i.e. the building of an innovative packaging for the pasta which was launched in 2002. The capacity of the entrepreneurial group in identifying the new packaging (up until then used for other foodstuffs) and

transferring its use to pasta was crucial. Numerous *problems ensued which required the activation*, in particular, of contacts with the external enterprise which would later on set up the production plant for the new packaging. With the introduction of the new plant, the management and organisation of the production plants were important, and the role of the collaborators in the setting up of the new production cycle was quite influential.

In the light of the previously outlined analysis, Figure 5 represents the levels of activation of the resources: also in this case, the role of the entrepreneurial resources was high, while the level of activation of the network resources was medium-high and that of the collaborators medium. Instead, the role of the managerial and organisational resources was thought to be medium-low.

The last innovation analysed is the production line of pasta made from raw material of certified origin (2001). This innovation was the result of a *process of research and development* which, in a few years, led to the launch of a new product. As well as the will and the innovative spirit of the entrepreneurial group, the *relationship set up between the enterprise and public research bodies*, in particular the Universities, proved a determining factor. The planning of the organisation to accomplish such a complex innovation was particularly relevant.

Figure 5 provides a graphical representation of the level of activation of the resources for this innovation: the contribution offered by the entrepreneurial group and the network resources was high. Conversely, the level of activation of managerial and organisational resources was medium-high, while the contribution offered by the collaborators proved medium.

6. Discussion

In this section, conclusion about the results of the business cases previously described will be drawn.

Although the five Companies analysed are involved in different sectors, their innovation processes are characterised by some common aspects, such as the time continuity in the innovation processes, continuous entrepreneurial strain towards innovation and the centrality strategic role of the innovation.

In each firm, moreover, the success of the first innovation is mainly based on the Resources of the Entrepreneurs, on his professional experience and in depth knowledge in the sector and in the production process, his capabilities to understand the dynamic and the evolution of the market.

Over the years, although the preponderant role of the Resources of the Entrepreneurs, the level of activation of other resources tends to increase until reaching an importance that is equal, if not superior, to that of the entrepreneur.

During the interview phase, what is highlighted is the entrepreneurial consciousness about the necessity to create a network with external research centre, university and supplier. But also the necessity to create value

and make the collaborator an active part in the innovative process.

Finally, what emerge is how the role of the Entrepreneur is changing. In all the companies analysed, in the first innovation the role of the entrepreneur was mainly of “inventor” and “developer”, where the role of the collaborators and of the external resources were irrelevant to the success of the innovation. Over the years, the only resources of the entrepreneur are not sufficient to sustain the complexity of a challenge environment. The entrepreneur becomes the coordinator of the resources needed to the success of the innovation. This is a key issue in the success, over the time, of innovations realised in all the companies studied in our research.

Summarising, the SMEs’ innovation capabilities is the results of both the Entrepreneur’s attitude to innovate and his capability to become over the time an “orchestrator” of the company’s resources. All the interviewed Entrepreneurs showed such consciousness of the necessity to go on in this direction, through a process where the entrepreneur is able to build a network of relationship based not only on his capabilities.

6.1 Current limit and future development

In this study, only successful company have been analysed. There is a need to interview businesses which, although successful, do not innovate with continuity; businesses which innovate but without great success; businesses which do not innovate and tend to “rest on their laurels”. There is the need to get a clear and comprehensive picture of a representative sample of an entire study population. Besides, it would be interesting to stratify a possible sample by sector of operation and by dimension, by lifetime of the business, by the number of innovations both of the products and the processes.

Final aim will be the identification of “best practices” to guide the governance of the innovative processes in SMEs, thus also to support association which promote entrepreneurial culture and innovation.

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Abstract

As is well known, innovation is one of the most important strategies of competition for small and medium enterprises (SMEs). It is often argued that SMEs innovate in specific ways, different from the innovation process in large firms. But what are the capabilities to identify innovative SMEs? Which are the key resources in the SMEs innovation process? How can SMEs sustain innovativeness all over the time? In this paper, authors try to give an answer to the previous questions through a methodological proposal aimed at analysing the determinant of the success of innovation processes in SMEs. The methodology has been applied in the course of case studies, in particular in 5 Italian innovative SMEs. In fact, all the firms were characterised by a continuous effort in the innovation processes. Results of the case study highlight that a key issue in the success of innovation processes in SMEs is the transformation of the role of the Entrepreneurs, who become the coordinator of the critical internal and external resources to a successfully innovation process.

Sommario

Come è ben noto, nell'attuale contesto competitivo anche per le Piccole Imprese (PI) l'innovazione diventa una necessità. Ma quali sono le capacità che contraddistinguono una PI innovativa? Quali risorse giocano un ruolo chiave per il successo delle innovazioni? In che modo una PI è in grado di mantenere nel tempo la propria capacità di innovare con successo? Questo lavoro fornisce risposta a tali quesiti attraverso una proposta metodologica finalizzata all'analisi delle determinanti del successo dell'innovazione nelle PI. La metodologia è stata applicata a 5 casi di PI contraddistinte dalla continuità del successo dell'innovazione nel corso degli anni. I risultati dei casi di studio evidenziano come un elemento chiave per il successo delle innovazioni sia il cambiamento del ruolo dell'Imprenditore che da unico attore dei processi innovativi nei primi anni di vita dell'impresa diventa, nel corso del tempo, il coordinatore delle risorse, interne ed esterne, critiche per il successo delle innovazioni.

Classificazione Jel: L 26.

Parole chiave (Key Words): Innovazione, ruolo dell'imprenditore (Innovation, capabilities, role of entrepreneur)