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**The big challenge to be small and innovative: the paradigm of open  
innovation applied to SMEs**

**RELATORE:**

**CH.MA PROF. GAMBAROTTO FRANCESCA**

**LAUREANDA: SPANEVELLO FRANCESCA**

**MATRICOLA NUMERO: 1109522**

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Firma della studentessa



*A Silvia,  
tu sai.*



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## Introduction

The enterprise is a combination of relatively static and hardly transferable resources, transformed into capacity through dynamic processes operated by the company, where individual abilities, organizational skills and technological knowledge surround the resources, giving them the conditions to support processes of value creation<sup>1</sup>. Business dynamism and the ability to innovate therefore play a key role in business progress by allowing companies to maintain a competitive advantage or to recover disadvantaged conditions. Innovation has taken on a more and more important role and the company approach has changed significantly in this sense. The concept of vertically integrated company that dominated the twentieth century is therefore now obsolete and companies are in fact increasingly driven to look outside. All this is due to many factors, first of all globalization where international competition pushes companies to develop different products and services, thus reducing their life cycle, thus forcing companies to look for innovative processes at lower costs. This is the origin of the paradigm coined by Henry Chesbrough in 2003 of *open innovation*, where it is highlighted that it is essential for the company to change posture, moving from a closed innovation, where the innovative process took place within the large research and development departments, on a more open condition, turning its gaze to other companies, other countries and also to scientific institutions<sup>2</sup>. This system creates a great innovation network characterized by two types of equal and opposite flows where, on one hand, ideas and new approaches move from outside to the inside of company, on the other hand, instead, this flow pours out of the enterprise, allowing the growth of the economic sector as a whole. The open innovation proposes a 360-degree review of the company strategy and this does not only concern the opening of research laboratories but also

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<sup>1</sup> M.A. Schilling, Izzo F, Gestione dell'innovazione, Milano, Mc Graw Hill

<sup>2</sup> Chesbrough, H. W., Open Innovation: The New Imperative for Creating and Profiting from Technology, Boston, MA: *Harvard Business School Press*, 2003

the review of business processes and a careful work on the human factor of the company<sup>3</sup>.

For years literature has been deeply concerned with open innovation and potential benefits for large companies, but tends to exclude smaller companies from analysis. So, can open innovation be a winning strategy for SMEs too? In which ways? Their models of innovation and their activities differ in fact from those of large companies. These rarely engage in "formal" research and development activities as large companies do and may have difficulty developing absorption capacity. The acquisition of external knowledge requires great internal capacities in order to integrate flows of knowledge with internal innovation activities<sup>4</sup>. What kind of internal actions must be implemented to guarantee the success of this type of strategy?

In the first chapter I will describe *open innovation*.

In the second chapter, I will answer to my questions by analysing SMEs and their relationship with (open) innovation.

Then, the third chapter is dedicated to Italian SMEs, being a unique reality characterized by 99.9% of small and medium enterprises with a 95.1% of micro enterprises, making an analysis on the propensity to innovation crossing it with our peculiar reality constituted by an overwhelming majority of family business<sup>5</sup>, trying to provide an answer to why Italian performance regarding innovation is far below the European average<sup>6</sup>.

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<sup>3</sup> Di Minin A., *L'impresa è un'opera aperta, il sole 24 ore*, 2016

<sup>4</sup> Brunswicker S., Vanhaverbeke W, Open innovation in small and medium-sized enterprises (SMEs): External knowledge sourcing strategies and internal organizational facilitators, *in Journal of Small Business Management*, 2014

<sup>5</sup> <http://www.aidaf.it/aidaf/le-aziende-familiari-in-italia/>

<sup>6</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

## **Innovation**

*“Innovation distinguishes between a leader and a follower.”*

*Steve Jobs*

### **1.1 Economics of innovation: introduction**

The role of innovation as the key determinant of the *wealth of a nation* was already present in some works of classical economists like Adam Smith. He distinguished a first model of innovation based on experience and a second one referred to innovation processes based on scientific progress.

Then, these two concepts were renamed to DUI-mode of learning (learning by doing, using and interacting) and STI-mode of learning (science, new technology, innovation).

DUI-mode of learning:

A great part of the machines made use of in those manufactures in which labour is most subdivided, were originally the invention of common workmen, who, being each of them employed in some very simple operation, naturally turned their thoughts towards finding out easier and readier methods of performing it. Whoever has been much accustomed to visit such manufactures, must frequently have been shewn very pretty machines, which were the inventions of such workmen, in order to facilitate and quicken their own particular part of the work. In the first fire engines, a boy was constantly employed to open and shut alternately the communication between the boiler and the cylinder, according as the piston either ascended or descended. One of those boys, who loved to play with his companions, observed that, by tying a string from the handle of the valve which opened this communication to another part of the machine, the valve would open and shut without his assistance, and leave him at liberty to divert himself with his play-fellows. One of the greatest improvements that has been made upon this machine,

since it was first invented, was in this manner the discovery of a boy who wanted to save his own labour.<sup>7</sup>

STI-mode of learning:

All the improvements in machinery, however, have by no means been the inventions of those who had occasion to use the machines. Many improvements have been made by the ingenuity of the makers of the machines, when to make them became the business of a peculiar trade; and some by that of those who are called philosophers, or men of speculation, whose trade it is not to do anything, but to observe everything, and who, upon that account, are often capable of combining together the powers of the most distant and dissimilar objects in the progress of society, philosophy or speculation becomes, like every other employment, the principal or sole trade and occupation of a particular class of citizens. Like every other employment, too, it is subdivided into a great number of different branches, each of which affords occupation to a peculiar tribe or class of philosophers; and this subdivision of employment in philosophy, as well as in every other business, improve dexterity, and saves time. Each individual becomes more expert in his own peculiar branch, more work is done upon the whole, and the quantity of science is considerably increased by it.<sup>8</sup>

Later, in 1912 with *Theory of Economic Development*, Schumpeter distinguished himself from neoclassical paradigm and overcame the "static" economic approach by introducing a "dynamic" one that explains better the development issue, stressing that everything is subject to *continuous transformation*.

The fundamental contribution made by Schumpeter to the market economy theory is introduction of crucial role of an *innovative entrepreneur* in

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<sup>7</sup> Smith A., *An inquiry into the nature and causes of the wealth of nations*, 1776, p.8

<sup>8</sup> Smith A., *An inquiry into the nature and causes of the wealth of nations*, 1776, p.9

implementing mechanisms of genuine economic development based on carrying out of new combinations or innovations. Schumpeter introduced a new economic category of *genuine entrepreneurs*, who carry out new combinations and provide economic development of a country.

According to Schumpeter, capitalism is a run-up between imitators and innovators. He proposed a model in which the starting point is a *steady state* where the companies put in place only routine activities, where economic life repeats itself evenly over time, and added value produced by them is exactly sufficient for cover production costs and depreciation without creating new wealth. Economic development begins when an entrepreneur breaks the steady state by introducing an innovation, which, for Schumpeter, is any technical invention, new organizational formula, creation of new products or new markets, which make it possible to create new wealth, which not only cover production costs and depreciation, but create profit. For Schumpeter, profit, can be greater than zero only in the presence of innovations. The innovative entrepreneur is the protagonist of economic development, as it creates real added value, and makes the social system dynamic. The innovator is then followed by a *swarm* of imitators, which are not authentic entrepreneurs, who are attracted to profit like bees from nectar<sup>9</sup>. Therefore, they enter in sectors in which innovations have occurred and created profits and, as a result of the increase in the number of companies and supply of goods, the market price decreases until it completely absorbs the profit generated previously by innovation, thus restoring the economy at a steady-state, until a new innovation re-initiates the cycle of economic development. Imitation has not only a negative value: it, as a *creative destruction*, plays an important role, since it ensures that the benefits of innovation do not remain concentrated only in the company that has innovated but extends to the whole society. Schumpeter argued that the key role of the origin of innovation lay in supply, where consumers would absorb the innovations proposed by innovative entrepreneurs.

In conclusion, the role and the meaning of innovation has changed across time, parallel to the social, cultural and economic context. In fact, during the second

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<sup>9</sup> Kirzner I. M., *Creativity and/or Alertness: A reconsideration of the Schumpeterian Entrepreneur*, *Kluwer Academic Publishers*, 1999

half of 1900s, it was spread the concept of *closed innovation*, actually defined later in 2000s by researchers. In recent decades, however, a debate has emerged on the decline of the closed innovation model and the affirmation of the new paradigm of open innovation<sup>10</sup> that characterizes the present days. But what is closed innovation in detail and what factors have led this model to be obsolete and be replaced by open innovation?

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<sup>10</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, MA: *Harvard Business School Press*, Boston, 2003

## 1.2 Closed Innovation

In the first part of the twentieth century, around the 20s and 30s, the research and development departments began to spread with the growth of company size<sup>11</sup>. Large companies could only generate innovations by investing in these large departments, because the context in which they operated was in fact very different from today.

Although science was entering an era of huge tumult, with the contribute of many great scientists such Einstein and Curie, much of the science had not commercial purpose. At that time, a scientist could not ruin his reputation with discoveries that had commercial aims, they had to do research for purely scientific purposes, to nurture knowledge. Some scientists like Thomas Edison were regarded as inferior scholars who had been corrupted by companies. It is therefore clear that there was also a social fracture in the relations between scientific wisdom and business; universities, unlike the present day, did not lead the lessons for commercial purposes but purely to feed other discoveries. Moreover, from the government point of view, it didn't give much assistance to industrial firms. It did pursue a few initiatives, such as the creation of a patent system, and provided limited funding of particular inquiries in weights and measures and in military materials such as improved gunpowder.

In this isolate contest industry R&D laboratories were the primary locus of industrial research. Industries were seen as self-sufficient castles with high walls with occasional visits from outsiders and where their inhabitants ventured out rarely into the surrounding landscape to visit university or scientific expositions.

The result was a fertile period for R&D. At that time, the corporate structure can be imagined as a high castle where, within the four walls, worked the most competent people that the company was able to employ. The trained people who worked in the research and development departments were focused on developing long-term research programs. It seemed that even the R&D was characterized by strong economies of scale in fact the company that was able to progress faster in innovations was also able to drive the market and enjoy profits. In fact, these departments demanded large investments that only big

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<sup>11</sup> Chandler A., *Strategy and structure: chapters in the history of American industrial enterprise*, Cambridge, 1962

companies could afford, therefore they served as major barriers to entry for competitors, who had to own enough economic availability to run expensive long-term searches in order to compete.

The key element of this approach was that R&D department was closed to outside, centralised and totally internal. In other words, it implies a strong *vertical integration*, starting from the beginning of the production chain, choosing tools and materials, until the end of process with sales and services. Consequently, companies were totally isolate from outside and if from one hand they could enjoy completely by their profits, from the other hand they had to solve technological problem alone.

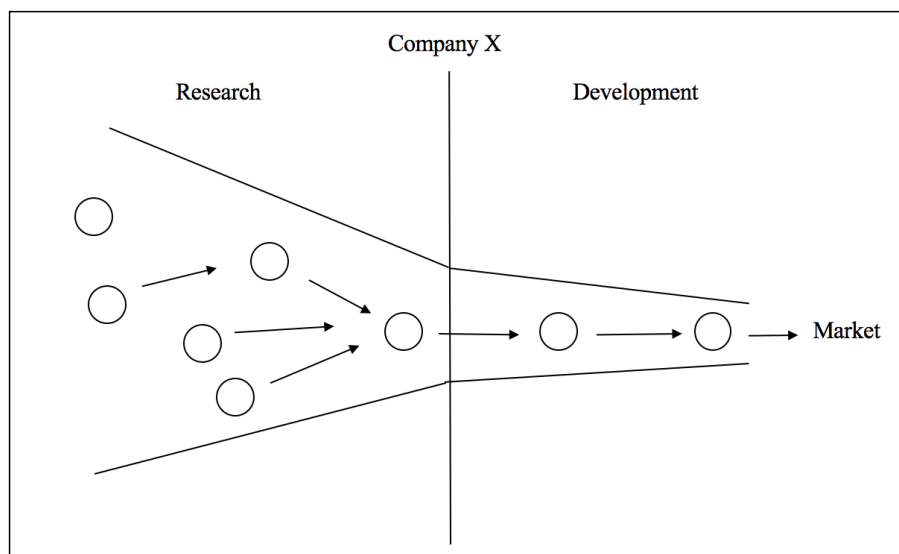


Figure 1- Closed innovation process<sup>12</sup>

As it is shown in figure number one, the company is represented as a funnel with very definite borders. The ideas move from left to right and thanks to the strong selection process the company avoids bringing on the market ideas that initially seem good and that subsequently prove to be of little value, called *false positives*. This process, however, does not allow to identify all those ideas that initially do not seem to be promising, and subsequently they prove to have great value, the *false negatives*. So, this approach shows a first stage of company value loss but also for the whole society, given that ideas have no alternative ways to go outside and find development correct way. The funnel structure that is gradually tightening, discourages the choice of many ideas

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<sup>12</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, MA: Harvard Business School Press, Boston, 2003



before they can be evaluated in its entirety. In fact, only those that are in line with the company's strategy are chosen. It is clear therefore how much this structure leads to a waste of time and money for all those ideas that maybe at the moment were not valid for the company line but that could be extremely valid for other external companies. From the other hand if company are able to keep rich flow of new ideas into the funnel, it can capture the value from these ideas. In this way company can reinvest in further researches and keep vertical integration sustainable over time.

### **1.2.1 Closed innovation crumbling**

In some industries, the approach focused on internal and centralized research and development, remains well adapted to innovation management because the protection of intellectual property is very tight, or regulatory restrictions are very high, or both; new start-ups are rarely born in these market sectors and also venture capital makes little investment. In this way, the company has the opportunity to keep the new technologies on the shelf until they are completed and ready to be placed on the market, without any worries that some other company can exploit the same technology.

Instead, in many other industries, the logic of the closed innovation paradigm has become fundamentally obsolete due to three main factors.

*First* factor that contributed to the crumbling of the closed innovation paradigm was the increasing availability of *skilled workers*. This factor has many causes, among them was the great increase of graduates and postgraduate students thanks to the spread of programs established in order to stimulate the expansion of higher education.<sup>13</sup>

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<sup>13</sup> The fifties in the United States were characterized by profound social and political changes that would have had great consequences only in the following decade. At the end of the Second World War, with the return home of millions of American soldiers, there was a real *baby boom* that would increase the number of enrollments in high schools and universities in the early sixties. Students of university aged between 18 and 22 will pass from 15% in 1940 to 44% in 1965. Mammarella G., *Storia degli Stati Uniti dal 1945 ad oggi*, Editori Laterza, 2013

University of Milan moved from 7,461 registered in 1959 to almost 20,000 in 1969-70. From that moment, thanks to student protest and the other suggestions that it

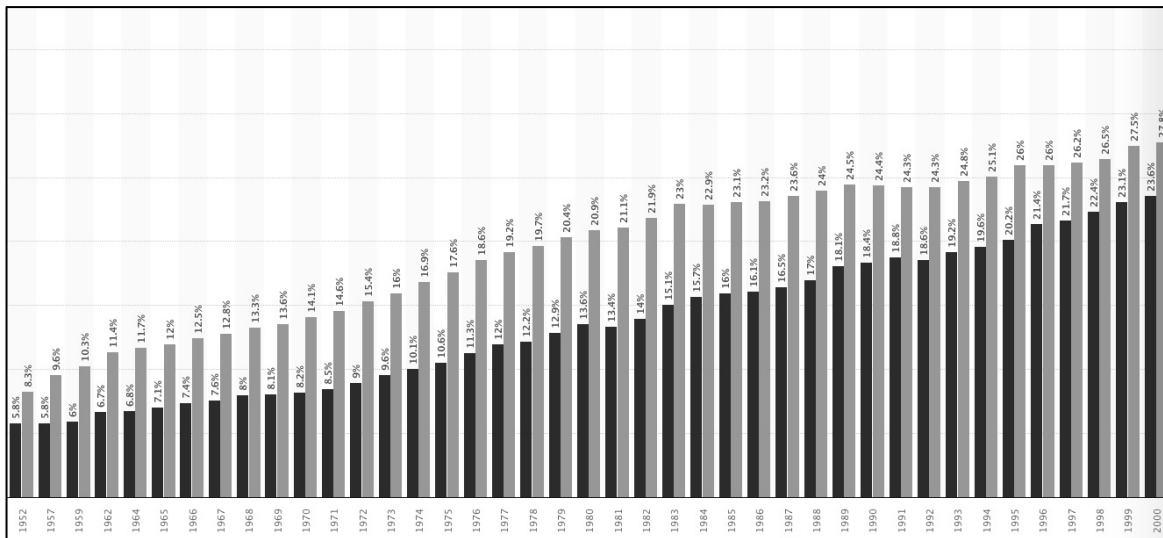


Figure 2 - Percentage of the U.S. population with a college degree 1952-2000<sup>14</sup>

The growth of skilled population number has consequently allowed an increase in the production of useful knowledge. People could be seen as *raw materials* for innovations. This diffusion of knowledge has removed the exclusivity of internal R&D departments and it has allowed spread of competence to suppliers, customers and more generally, to third parties outside the company. On the other hand, with the most widespread information, the new companies could access to useful knowledge that previously were in the hands of small niches of privileged people who could afford a high degree of education. In this way, it was very clear how a company could profit from the training and experience that another company had, mostly trying to hire its skilled employees.

A particular example of this “learning by hiring away” happened in the hard-disk-drive industry with IBM. IBM was the leading innovator in its sector, earning the *lion’s share* of the industry’s profits. Company owned many long-term researches and obtained the majority of the patents in the industry. Despite the company’s dominance, the mobility engineers caused IBM’s leadership to erode over time. An engineer named Alan Shugart left IBM and go to Memorex and shared with them IBM secret technologies; then he left

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fed, the trend gradually became more intense and accelerated, up to the point of the 63.642 registered in 1978-79. [www.unimi.it](http://www.unimi.it)

<sup>14</sup> [www.statista.com](http://www.statista.com)

Memorex to start a company called Shugart Associates, pursuing a new kind of hard-disk drive, intended for mini computers and workstation. With each job change he made, Shugart took a substantial number of people with him to the new company<sup>15</sup>.

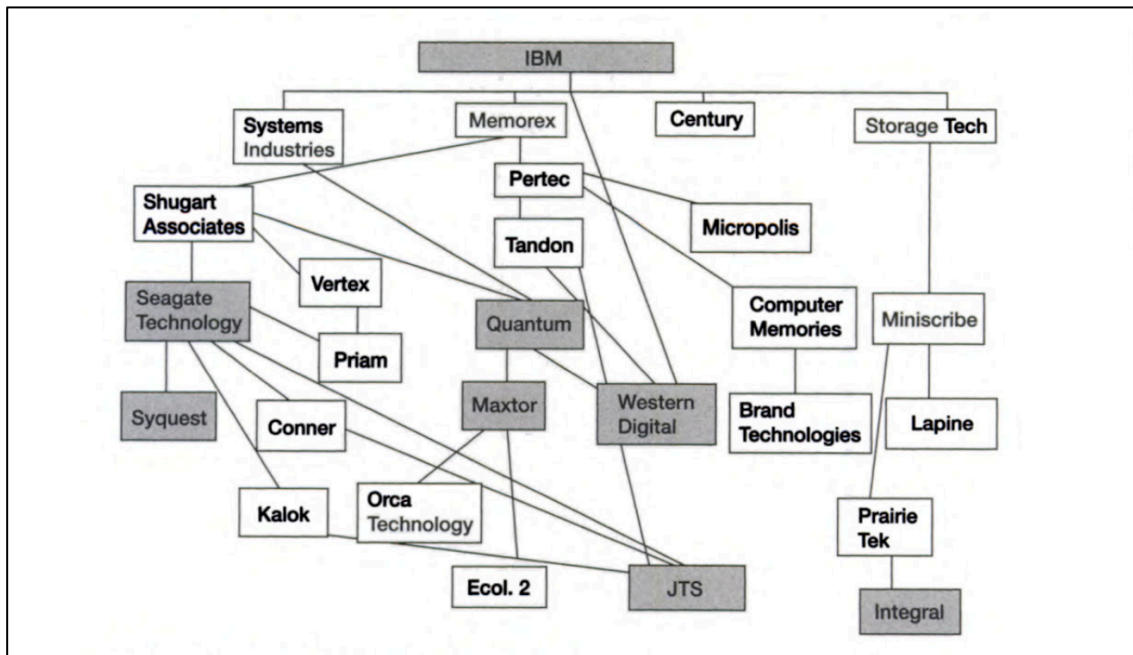


Figure 3-IBM and its offspring Hard-disk-drive companies, December 1996<sup>16</sup>

The figure above shows a perfect picture of how a fluid labour market allows the birth of many children start-up starting from a mother company. In fact, graph shows a partial genealogy of hard-disk drive firms from 1973 through 1996, in particular displays that the companies above are made of ex-IBM personnel which were in their top management teams at the time they were founded.

The *second* factor that has led to the demise of the closed innovation paradigm was the increasing of *venture capital market*. Although there were start-up companies that born from people coming from large firms, these new businesses had to fight to find capital.

<sup>15</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology.*, MA: Harvard Business School Press, Boston, 2003

<sup>16</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology.*, MA: Harvard Business School Press, Boston, 2003

Start-ups could not rely solely on the attractive power that they exercised on the skilled staff of other companies, and they had to realise that employees were not inclined to take a risk leaving a well-capitalized company for a reality yet to be defined.

But during 1980s there has been a big change about this situation and an enormous expansion of venture capital happened.

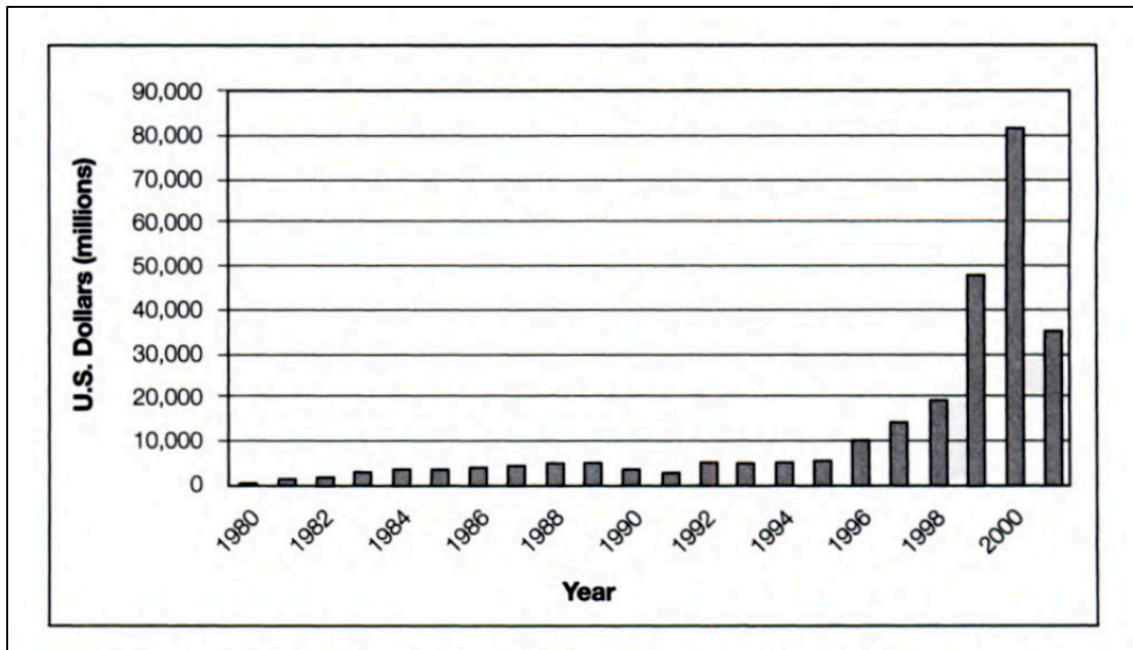


Figure 4 - Total investment in U.S. Venture capital, 1980-2001<sup>17</sup>

In 1979 there have been some changes in Employee Retirement Income Security Act (ERISA) called “prudent man” rule and this justified an increase in money flowing into venture capital sector. Prior to 1979, pension funds were severely limited by ERISA in the amount of money they could allocate to high-risk assets including venture capital. The 1979 change explicitly allowed fund managers to invest up to 10% of their capital in venture funds. Pension fund commitments to venture capital rose dramatically increasing annual new contributions to venture capital funds from \$100-200 during the 1970s to in excess of \$4 billion by the end of the 1980s<sup>18</sup>. Many successful firms received venture capital financing and created tremendous growth in

<sup>17</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology.*, MA: Harvard Business School Press, Boston, 2003

<sup>18</sup> Gompers P. A., *The rise and fall of venture capital*, University of Chicago, 1994

both technological development and jobs. This large and growing pool of venture capital created real hazards for the companies that made significant commitments and investments to internal R&D. The knowledge that they created inside their own knowledge silos and stored in their buffers between research and development was now at much greater risk. Individual personnel from their laboratories had been lured away by reward compensation packages to join new start-up firms.

The *third* problem that led to failure of closed innovation paradigm was the problem between the research group and the development team.

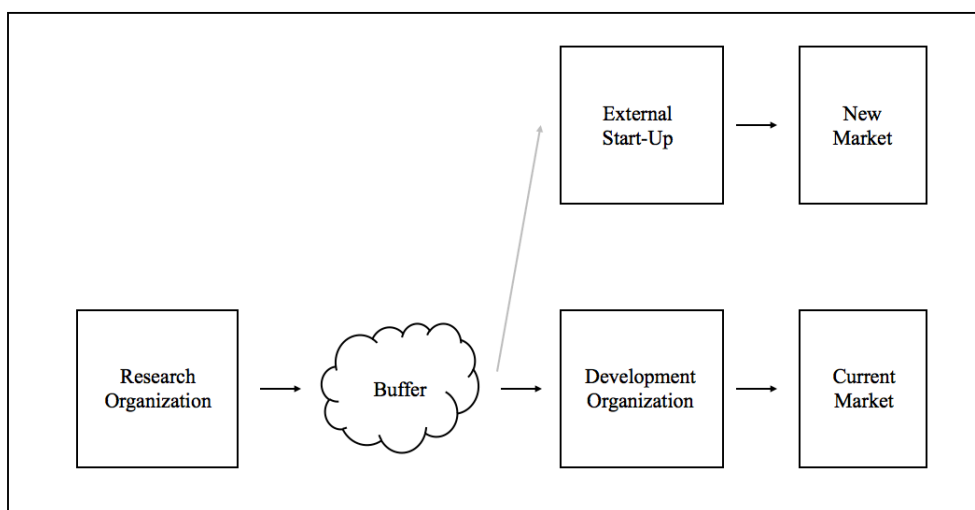


Figure 5 - The outside option for ideas on the shelf<sup>19</sup>

As a result of the combination of the first two erosion factors it was formed an outside path to market for many ideas.

As shown in figure five, if these ideas were left on a steady state situation waiting that the development group works in them, they might follow an outside route.

Instead if the development department was not ready to apply and use the new research result, it was impossible to assume that these ideas could be always sit *on the shelf* and moreover the authors of these innovations could not find other ways to commercialize them.

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<sup>19</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology.*, MA: *Harvard Business School Press*, Boston, 2003

To these three erosion factors identified by H. Chesbrough it is possible to add two others, which amplify and accelerate the effect of the previous ones, and which are the consequences of internet development: the acceleration of the speed of information exchange, given both by the availability of advanced search engines, and by increasingly faster internet connections; the simultaneous reduction of the cost to be incurred to exchange information, given both by low-cost internet access and by the availability of public scientific databases and online newspaper articles.

In conclusion, these erosion factors have rearranged the landscape of knowledge. The distribution of knowledge has shifted away from the tall towers of central R&D facilities, toward variegated pools of knowledge distributed across the landscape. Company can find vital knowledge in customers, suppliers, universities, national labs, consortia, consultants and even start-up firms. Companies must structure themselves to leverage these distributed pools, instead of ignoring them in the pursuit of their internal R&D agendas. In this new contest companies should benefit from a different innovation model with a different logic about the sources and uses of idea: the open innovation model.

### 1.3 Open Innovation

The term *Open Innovation* is defined for the first time in a work by Henry Chesbrough considered to all effects the father of this model. Although the first literature on the subject was developed by Chesbrough in 2003, examples were already present in the practice of "how to capture ideas from the world" (such as the P&G "Connect + Develop" project launched in 1999). The erosion factors expressed in paragraph 1.2.1 have undermined the Closed Innovation approach, breaking the virtuous circle, which self-perpetuating the sustainability of the model, thus leading to the new Open Innovation paradigm.

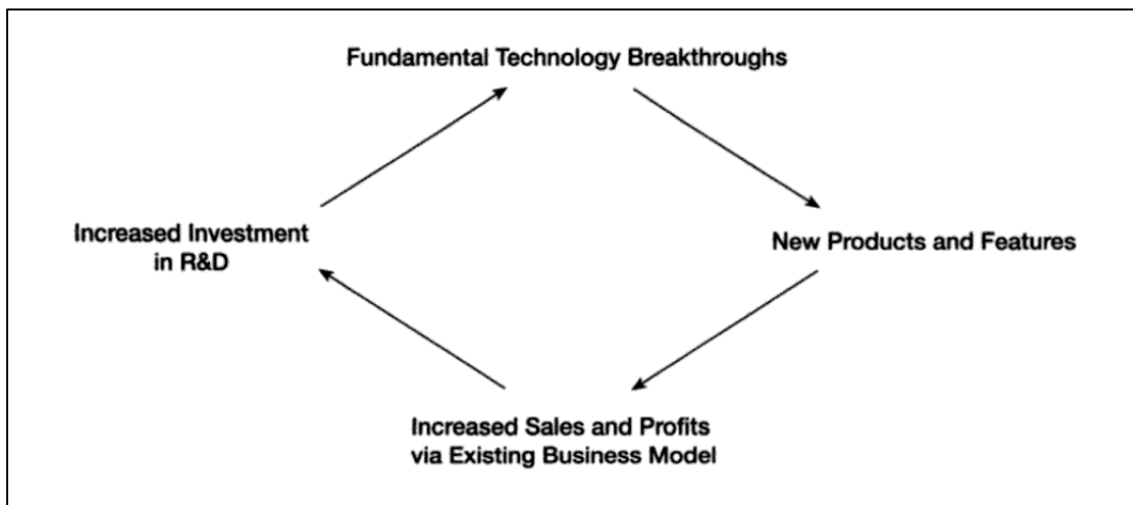


Figure 6 - The virtuous circle<sup>20</sup>

As shown in the figure above the virtuous circle has broken because in the new paradigm, companies continuing to operate with highly integrated vertical structures leaving some ideas on the shelf, are likely to get them stolen from other established companies or start-ups, which realizing new products or services, capitalize the investments made by the original company. As it is natural, many of these start-ups fail, while others are acquired by larger companies by capitalizing the investment of Venture Capitalists and investors who started the start-up. In the best case, start-ups do not reinvest their profits in further research projects, as they prefer to look for other start-ups to finance outside, thus breaking the virtuous circle that kept the Closed Innovation model in place. Moreover, given that the first big company in which the idea

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<sup>20</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology.*, MA: *Harvard Business School Press*, Boston, 2003

was born did not get returns from the invention that subsequently proved successful, it has no profit to invest in new development projects. Erosion factors have definitely changed the context in which businesses move, transforming a low diffusion of knowledge into a wide dissemination of knowledge that is now held by universities, consultancies, consortia, research centres, start-ups etc.

Therefore, the elements that underlie the Open Innovation paradigm are:

- The high diffusion of knowledge;
- The existence of alternative routes to the internal one, through which the ideas can reach the market;
- A faster life cycle of a product.

Chesbrough in his first work on Open Innovation defines the new paradigm in this way:

*“Open innovation is a paradigm that assume that firms can and should use external ideas as well as internal ideas into architectures and systems whose requirements are defined by a business model. The business model utilizes both external and internal ideas to create value, while defining internal mechanism to claim some portion of that value. Open innovation assumes that internal ideas can also be taken to market through external channels, outside the current business of the firm, to generate additional value.”<sup>21</sup>*

First of all, given the new context of dissemination of knowledge, companies must take advantage from peculiarities of the new environment by making organizational variations that change the approach to the innovative process by moving from a closed to outside to one as open as possible. Therefore, instead of creating large internal research centres to produce as many inventions as possible and drive the sector, companies should draw on external knowledge as more available and significantly less expensive and use these centres to capture knowledge from outside and then fill existing gaps in new

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<sup>21</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, MA: Harvard Business School Press, Boston, 2003



knowledge, applying it in the creation of new products or services (these operations are defined by Chesbrough activities of "*outside-in Open Innovation*"). On the other hand, the company, always to take full advantage of the new context, should try to make its knowledge as most profitable as possible, so it becomes clear that it is no longer believable to leave ideas on the *shelf*. Now the company, also through its internal research centre, should look for new external uses for inoperative inventions that could lead to new products or services if used by other companies or start-ups.

The latter with a different business model can conduct innovative ideas to the market, transforming innovations that the company had on the shelf, into new revenue. By bringing out the idle ideas from the company to license them through partnerships or by investing in new start-ups, a company could get a profit from what was previously considered a cost (these activities lead internal ideas to follow external development paths giving rise to "*inside-out Open Innovation*" activities).

The gain that the company can derive through Open Innovation inside-out paths is both of economic nature and social nature. In the first case the company can realize an economic gain through royalties using license, and moreover can get other types of advantages realizing partnerships or capital gains if the investment is made in start-up. In this way, companies focusing few resources on these projects avoid losing any future possibility of gaining from these ideas. In the second case the gain has a social nature, as it increases the satisfaction of the inventors who work in the company who see an outlet for their ideas.

Starting from this R&D centres have new role that must:

- On the one hand to seek, find and acquire knowledge available outside of which it is needed and integrate it with internal knowledge;
- On the other hand, look for ways to use ideas on the shelf, trying to turn a cost into a profit for the company.

So, the internal research centres, in the new paradigm, play the role of innovation intermediaries managing the intellectual property(IP) both inbound and outbound. In this way, IP management becomes a fundamental process of the open innovation process because, in a rapidly evolving environment in which knowledge is widespread, businesses must operate in the awareness that their innovations will soon or later be imitated and disseminated by other

companies. In this context, companies that come to new discoveries must, rather than keep them at their disposal, sell them to other organizations with the aim of reaching the widest possible market. This is why the IP manage is a strategic choice that need fundamental support of internal research centres. Precisely in the Open Innovation approach the company must be an active buyer of IP, this means that different business units will have different ideas to draw from (both internal and external). It follows that the development function will no longer depend solely on what derives from internal research. This leads to a competition of ideas inside and outside the company, thanks to which a process of continuous improvement of the internal research activity will be activated. On the other hand, the new paradigm envisages that IP is also managed outgoing, with consequence that research findings must not be brought to the market by the Development function but can follow external ways. Therefore, the company will evaluate each time the most opportune way to follow in order to bring ideas to the market.

The figure summarizes the approach to the innovative process suggested by the new Open Innovation paradigm:

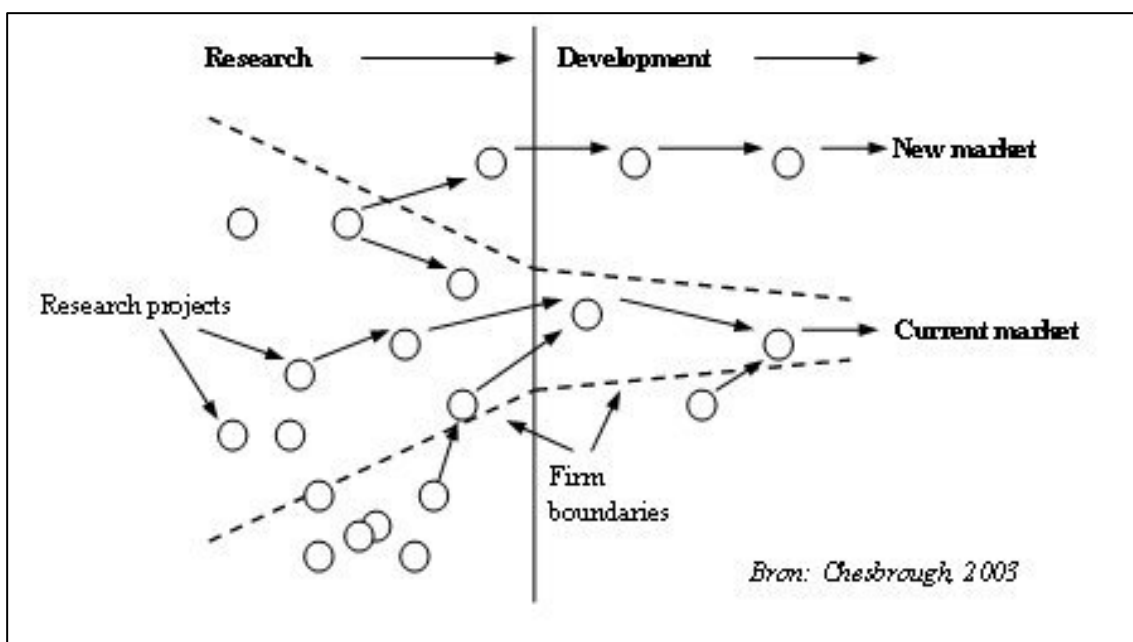


Figure 7 - New company's structure

As shown in figure above, the company boundaries are no longer as rigid as in the old paradigm and allow:

- On the one hand, the ideas that arise in the company to follow the external development paths that can lead to new markets (inbound process);

- On the other hand, external innovations enter the company at different stages of their development path (outbound process).

Following the scheme suggested by the figure, the ideas moving from left to right are selected avoiding bringing false positives on the market, but not only the model also allows to detect false negatives. The latter are given by those ideas that at first seem to have little value, revealing themselves only afterwards of great value and that according to the approach suggested by the old paradigm it would not have been possible to recover. In this way, the Open Innovation approach offers different paths to development, giving value to ideas that would not be immediately visible.

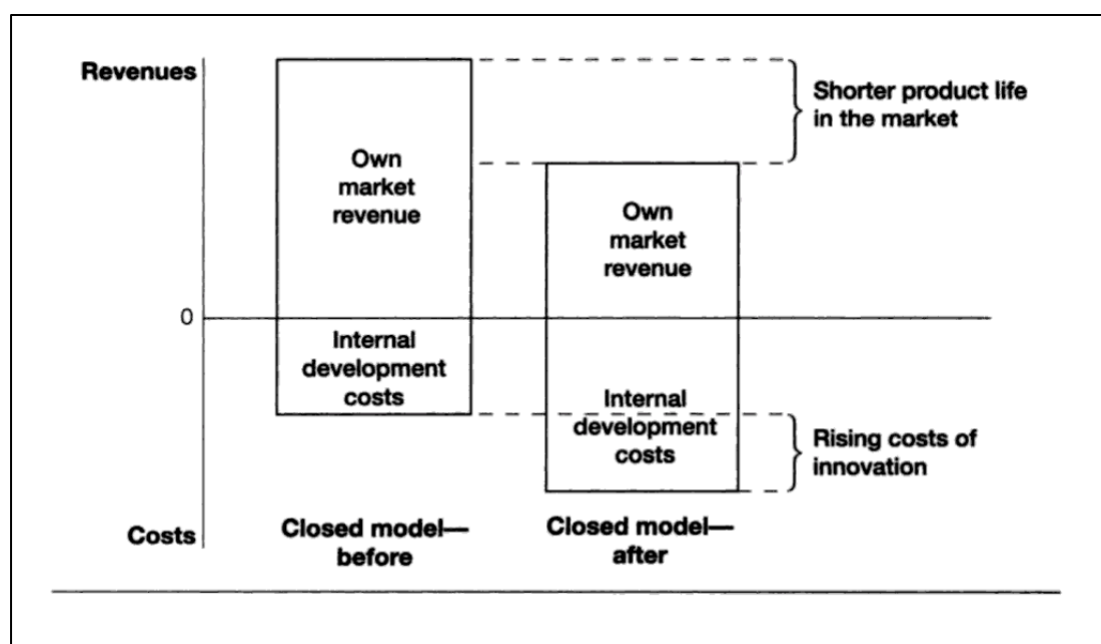


Figure 8 - New business model: Open innovation<sup>22</sup>

The figure number eight shows a comparison between closed innovation model and open innovation model. The open innovation model allows companies to increase the ability to adapt to new markets, and brings benefits in terms of new profit opportunities thanks to the reduction of development costs, of which they also charge the other parties involved, and decrease the time to market.

In order to let it happens, it has to keep in mind a series of considerations that it could be defined as conditions for the success of the paradigm.

<sup>22</sup> Serio D., Quarantino L., L'innovazione aperta, la prospettiva dell'innovazione aperta e le nuove logiche organizzative e manageriali, *Sviluppo & Organizzazione*, 2009

Firstly, it is necessary to ensure at the same time "flexibility in the processes of Research and Development and control of critical knowledge"<sup>23</sup>. If, on one hand, the success of the open innovation model is based on the integration of internal competences and know-how and assets coming from outside, on the other hand the principle of "open but controlled"<sup>24</sup> is valid. In other words, the company that decides to transfer and integrate new knowledge into the research and development processes must, in any case, be able to exercise control over the results obtained and to appropriate the advantages of shared innovation.

Secondly, special attention must be paid to the strategic management of human resources involved in the innovation process, whether these are internal to the company, whether they are part of external communities. Since the open innovation model is based on knowledge sharing, this knowledge must be continually enriched and refined, which is why it is necessary to invest in training and motivate staff to participate in knowledge enrichment activities.

Finally, it is necessary to work towards an adequate cultural and organizational alignment with the consequences that derive from the implementation of an open structure, objectively difficult and risky. In light of the significant contaminations that arise from the adoption of the open innovation paradigm, organizational culture must be aware and open to change, in which all company actors share the principles of inter-functional and inter-organizational cooperation. Because the innovative process uses contribution made by different people, placed inside and outside the organizational boundaries, it is necessary for everyone to accept and manage cultural and professional differences.

The introduction of the new system generates notable consequences also from an *organizational-structural* point of view. In fact, due to the increase in the complexity of the operation of the system, the growth of coordination costs

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<sup>23</sup> De Marco C., Marullo C., *Manager ai tempi dell'ecosistema - Nòva, IlSole24ore*, 2016

<sup>24</sup> Di Minin A., *L'impresa è un'opera aperta, Il sole 24 ore*, 2016

and the creation of an extremely complex relational network<sup>25</sup> there is a difficulty in control activities.

In order to highlight this organizational change, it is considered a Cartesian plan where on the X axis there is the locus of innovation process (internal locus and external locus) and on the vertical axis there is the number of people involved in the process. The closed innovation model is written near the origin of Cartesian plan where the number of subjects involved in the innovation process is very small and the innovation locus is bounded by the walls of the Research and Development department. Instead with open innovation, the process now moves outwards causing an increase in the degree of complexity. And in fact, where the iterations increase and the centre of the innovative process is increasingly decentralized, the need arises to design a control system for the coordination of new networks of relationships.

In conclusion, the innovative process inspired by the open innovation paradigm concerns the whole organization, and it is not limited to the decisions and activities carried out within the research and development laboratories alone. On the contrary, it implies a series of adjustments, above all, of a strategic, cultural and organizational nature, which must be adopted so that companies can obtain the greatest number of competitive benefits. In fact, in the definition of Henry Chesbrough of the new paradigm, he highlights the role of the *business model*, which serves to define the requirements of the system and of the architecture that the company must have in order to combine profitably internal and external ideas.

### **1.3.1 Business models for innovation**

As already mentioned, in the transition from closed to open innovation, the company will also have to change the structure itself in order to be able to integrate external and internal flows of ideas. The business model defined by Henry Chesbrough and Richard Rosenbloom has the following functions:

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<sup>25</sup> Serio D., Quarantino L., L'innovazione aperta, la prospettiva dell'innovazione aperta e le nuove logiche organizzative e manageriali, *Sviluppo & Organizzazione*, 2009

1. “To articulate the *value proposition*, that is, the value created for users by the offering based on the technology;
2. To identify a *market segment*, that is, the users to whom the technology is useful and the purpose for which it will be used;
3. To define the structure of the firm’s *value chain*, which is required to create and distribute the offering, and to determine the complementary assets needed to support the firm’s position in this chain;
4. To specify the revenue generation mechanisms for the firm, and estimate the *cost structure* and *target margins* of producing the offering, given the value proposition and value chain structure chosen;
5. To describe the position of the firm within the *value network* linking suppliers and customers, including identification of potential complementary firms and competitors;
6. To formulate the *competitive strategy* by which the innovating firm will gain and hold advantage over rivals.<sup>26</sup>”

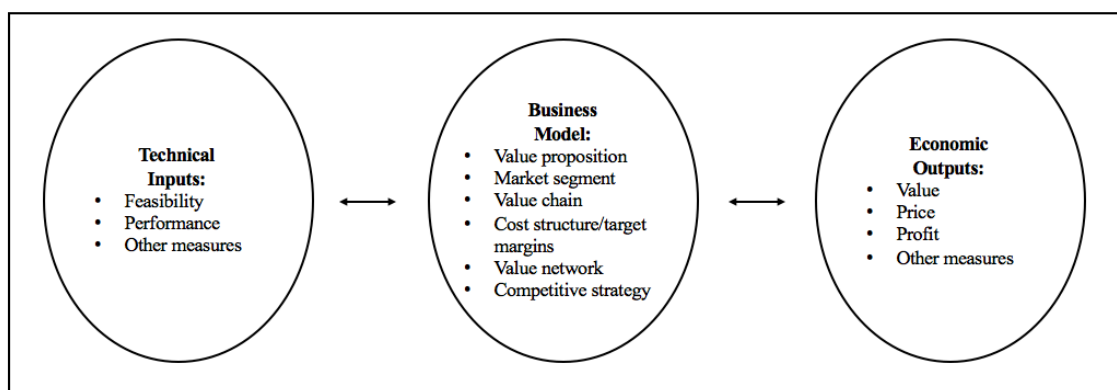


Figure 9 - From Technical Inputs to Economic Outputs<sup>27</sup>

The business model is therefore a tool that is able to transform technical inputs into economic outputs. But how? Through the synergistic combination of all the variables.

<sup>26</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, MA: Harvard Business School Press, Boston, 2003

<sup>27</sup> Chesbrough, H. W., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, MA: Harvard Business School Press, Boston, 2003

The six elements described above must therefore be intersected together in order to outline the right business model for a company. By delineating a *market segment* then it is possible therefore proceed with the definition of the *value proposition*. The first two points are therefore extremely linked: “What market segment are you going to cover? What customer problem are you solving?” After that it should be define the company *value chain*. Generally speaking it is as a set of activities that the company carries out in order to develop the product or service and distribute it to the consumer.

Therefore, the company, through the value chain, creates a bidirectional value: on one hand, it creates value for consumers, and on the other hand it creates value, called *margin*, for itself.

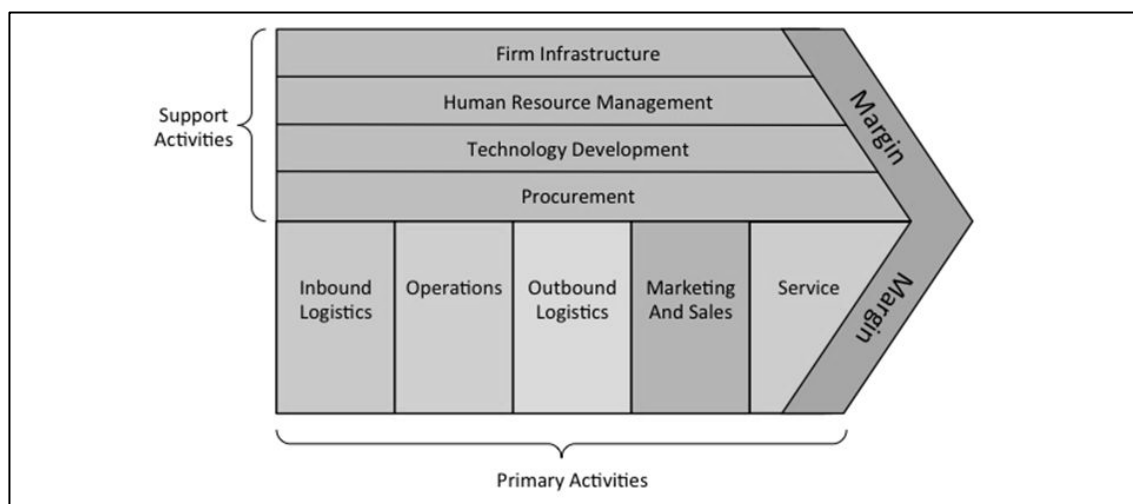


Figure 10 - Porter's value chain<sup>28</sup>

Following Michael Porter's theory, the value chain activities are divided between primary activities and support activities, which, subtracted from the cost to sustain their performance, create margin. To establish the setting of the value chain, the exploitation of the *network value* and the relative distribution of the value created among the subjects that are part of it, the company must know the *cost structure*, evaluating efforts and being able to determine *target margin* levels, or the returns to be recognized to the various subjects. The key concept of the open innovation paradigm is that knowledge is widespread also outside the company and it highlights how fundamental it is for the company to create a *network* that involves the external agents

<sup>28</sup> Yun J. J., Editorial open innovation in value chain for sustainability of firms, *Sustainability*, 2017

implicated with the creation of value. The more value a company creates, the more profitable it is likely to be. And when it provides more value to its customers, the company builds *competitive advantage*.

Business models not only must be developed: they also must be managed once they are developed.<sup>29</sup> As suggested by Henry Chesbrough it can be found different levels of business model in relation to investment made by a company in order to sustain any change across time and in relation to the openness degree of that company. These levels are six:

1. Company has an undifferentiated business model. The vast majority of companies do not specify a particular business model and do not have a structured process to manage it, these companies apply the type 1 business model. The company that uses this business model is aimed at the market in ways that they don't differ from those of many other companies, often falling into the commodity trap ("*commoditization*"). Usually these companies have enormous difficulties in maintaining a competitive advantage in their business for a long time. Sometimes they change strategy, copying an idea put in place by some other competing company perhaps by hiring staff from those companies. Because they rely largely on emulation, these companies are never on the cutting edge of innovations. When a superior technology takes over, companies that apply the business model of type one, can't react and when the market becomes saturated, they tend to disappear. The benefits of the Type 1 business model are primarily the costs, being the least expensive business model.
2. Other companies create a certain differentiation in products or services, also differentiating the business model, addressing customers, who do not buy only on the basis of price and availability but also, for example, depending on the performance. This type of company differs from the previously expressed model and exerts a certain *ad hoc innovation activity* where the actions are not well planned and the budgets are

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<sup>29</sup> Chesbrough H. W., *Open: modelli di business per l'innovazione*, Egea, 2006



dictated by what can be afforded and not by what is needed. This type is characteristic of many start-ups that promote a new technology in the initial development phase.

3. Many investments are needed to support this business model. These companies are able to better plan the future because they have a business model that allows them to segment their market. The price segment ensures high volume production and low costs. On the other hand, the performance segment ensures high margins. In a type 3 company innovation is no longer a random fact but becomes a planned activity, supported by constant financial and organizational resources; often there is a research and development laboratory followed by a specialized team. One of the main problems of the type 3 company is that it has a tendency to think of innovation only in terms of product or process, without taking into account its commercial dimensions.
4. In the type 4 business model, the company has an external-oriented model, opening up to ideas and technologies from other agents. What differentiates it from the type 3 business model is that for the process of market segmentation and the introduction of innovative processes, it relies on external sources of technology that are added to internal sources. This external innovation lowers the cost of operating activities and reduces the time required to bring new offers to the market and shares risks with the development of new products and processes with other parties. At an organizational level, the innovation process includes a more systematic analysis of current and potential customers in current and potential markets.
5. In the type 5 model there is a clear and shared perception of the business model that serves as a glue for business functions and helps them solve complex problems. This prospect also extends beyond the company, because external partners know what innovations the company is pursuing. Suppliers and customers are explicitly authorized to participate in the company's innovation process, which in turn is allowed to participate in their innovation process. In the model number

- 5, for the first time the introduction of the inbound and outbound process has been introduced. In organizational terms, innovation is considered a function of the business.
6. In the business model number 6 the concept of innovation also extends to the model itself which, on the one hand, can modify the market, but on the other has the ability to be modified by the market. This requires a willingness to invest large sums; some companies use venture capital made available by management to explore alternative business models in small start-ups; others use spin-offs and joint ventures to market technologies unrelated to the business model. In the type 6 business model, customers and suppliers become business partners as they participate in relationships in which both technical and business risks are shared. This allows the company to make its model a platform to drive the industry, including suppliers and customers; a platform that effectively organizes and coordinates the work of many others who support the business model.

In conclusion, in an open innovation model, company's business model drives innovation research, both from internal sources and from external sources. Companies need to look for useful technologies that can advance their business model from all sources that can offer appropriate opportunities at the right time. To manage internal and external innovations in an open business model it is necessary to build and support a rich network of innovation, connected to an external and diversified community. To integrate an open business model, it is clear that a huge commitment is fundamental both from an organizational and an economic point of view.

Given the newness of the open innovation paradigm, scholars are providing wide literature on the link between this concept and large corporations, while excluding from the study a smaller but widespread reality, small and medium enterprises. In the last years, however, some researchers are trying to fill this gap by analysing the feasibility of open innovation to smaller businesses that have very different characteristics from large companies analysed by Henry Chesbrough.

## **Innovation and SMEs**

“Innovation never came through bureaucracy or hierarchy. It has always come from individuals”

*John Sculley*

### **2.1 SMEs**

Micro, small and medium enterprises (SMEs) are defined as the engine of the European economy. They are essential for job creation and economic growth and ensure social stability. In 2013, more than 21 million SMEs offered 88.8 million jobs across the European Union (EU). Nine out of ten companies are SMEs and SMEs create 2 out of 3 jobs<sup>30</sup>.

The definition of SME takes into account the following three criteria:

- Staff headcount;
- Turnover or;
- Balance sheet total.

The category of micro, small and medium enterprises is therefore made up of companies that have less than 250 employees and a turnover less than 50 millions of euro or balance sheet total less than 43 millions of euro.

Activities of small and medium enterprises are often characterized by a strong local component and, while they are able to compete in the national and local market, they usually manage difficulty the international panorama because they are exposed to harsher competition and rapid and sudden changes.

Through the analysis of the small businesses value proposition, it was highlighted how there is a propensity towards creativity, innovation, and ideas, this may be due to a management approach based more on instinct and flexibility<sup>31</sup>. On the opposite, these are instead precluded to larger companies due to a more formal hierarchy, a more rigid corporate culture and the constant

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<sup>30</sup> User Guide to the SME definition, European commission, Luxembourg, 2015

<sup>31</sup> Zoltan J. A., Innovation in large and small firms, *Economics Letter*, 1987

pursuit of efficiency. It is also not statistically evident<sup>32</sup> that larger firms are better than SMEs in innovation, meaning that SMEs may well have capacity for innovation, especially radical innovation<sup>33</sup>. The key concept is that the innovation in SMEs is different from that in large firms because innovation processes are different.

SMEs have also a lot of disadvantages in the innovation process compared to large corporation in fact they often lack suitably qualified technical specialists because they don't have the great ability to attract employee because of the reduced career prospects, compared to large companies. Also, they have less resources and economic means compared to large firms but it is important to say that SMEs are generally able to leverage their limited R&D more efficiently than large firms using their R&D expenditure in collaboration with other external sources but even if they can reduce costs in this way constraints due to limits on resources remain. It can be said that SMEs have a *behavioural advantage* while large corporations have *material advantage*. As concern a finance point of view SMEs can experience great difficulty in attracting capital, especially risk capital, they have inability to spread risk over a portfolio of projects. Moreover, they can experience difficulty in acquiring external capital necessary for rapid growth and entrepreneurial managers sometimes unable to cope with increasingly complex organisations.

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<sup>32</sup> Laursen, K., Salter, A.J., Searching high and low: what type of firms use universities as a source of innovation? *Research Policy*, 2004

<sup>33</sup> Ettlie J. E., Bridges W. P., O'keefe R. D., Organization strategy and structural differences for radical versus incremental innovation, *Management Science*, 1984

## 2.2 SMEs and innovation

SMEs are increasingly seen as a factor of great value for the economy and society and therefore have the attention of policy-makers. Of particular interest is the way in which the SMEs innovate and recently they have started to support these activities. For example, in the EU<sup>34</sup> there is now a large innovation support infrastructure for SMEs and many individual countries manage direct support policies<sup>35</sup>. But despite the commitment to supporting SMEs, the main problem is that the innovation process undertaken is still a fairly unknown topic. The question then becomes how to facilitate innovation in SMEs, trying to discover which factors contributed to the success (or failure) of their innovation efforts. Scholars have collected little information, including the number of SMEs that undertake innovation activities and only a small part of the whole innovation world can be learned from statistics because SMEs do not necessarily innovate in formal and recognised ways. Studies show that SMEs are more likely to perform product rather than process innovations, targeting a niche market rather than a mass market<sup>36</sup>. In micro-companies, it was also noted how their peculiar structure is favourable to innovation, they are not hierarchically formalized and are more organized with respect to the project to be implemented. This allows them to be faster and quicker in terms of innovation times but also more responsive to direction changes in case of unsatisfactory answers from market in which they operate. Their narrowness in terms of resources and their small size means that, by

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<sup>34</sup> It has been created an *Enterprise Europe network*, it helps small companies make the most out of business opportunities in the EU. It is a one-stop-shop for all business needs. It provides support on access to market information, overcoming legal obstacles, and identifying potential business partners across Europe. <https://een.ec.europa.eu>

<sup>35</sup> For example the “Small Business Enterprise and Employment Act” of 2015 and the “Exporting is GREAT” initiative in the United Kingdom. 2017 SBA fact sheet, European commission, Luxembourg, 2017

<sup>36</sup> Hoffman, K., Parejo, M., Bessant, J., Perren, L., Small firms R&D, technology and innovation in the UK: a literature review, *Technovation*, 1998

nature, they apply an *external focus innovation* made of strongly embedded in social and personal ties. In fact, strategic and multi-actor alliances are critical drivers of innovation and help them to access critical resources, to extend their technological competencies, and to build legitimacy and reputation.

Despite this natural propensity to openness, SMEs were mostly excluded from the open innovation discussion for three main reasons:

1. Generally speaking, open innovation is easier to study if companies are large, SMEs have less access to external resources and few technological resources that can be exchanged compared to large companies.
2. SMEs apply a non-internal innovation much more than large companies, which means that innovation already has an external focus for them.
3. SMEs exploit external resources mainly to access sales and marketing channels, especially at the *commercialization* level, while open innovation generally focuses on the initial stages, as regards the creation of a technological network between companies that generate innovations.

SMEs often lack the capacity in terms of manufacturing facilities, marketing channels and global contacts. Success in the market is essential to determine if an innovation is triumphant or not and therefore implies successful commercialization, so SMEs get enormous benefits from support in this sense<sup>37</sup>.

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<sup>37</sup> Vanhaverbeke, W., Cloudt, M., Open innovation in value networks, *Oxford University Press*, NY, 2006

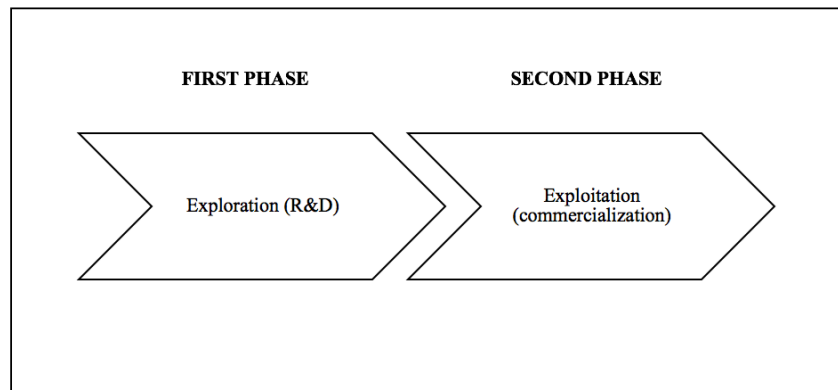


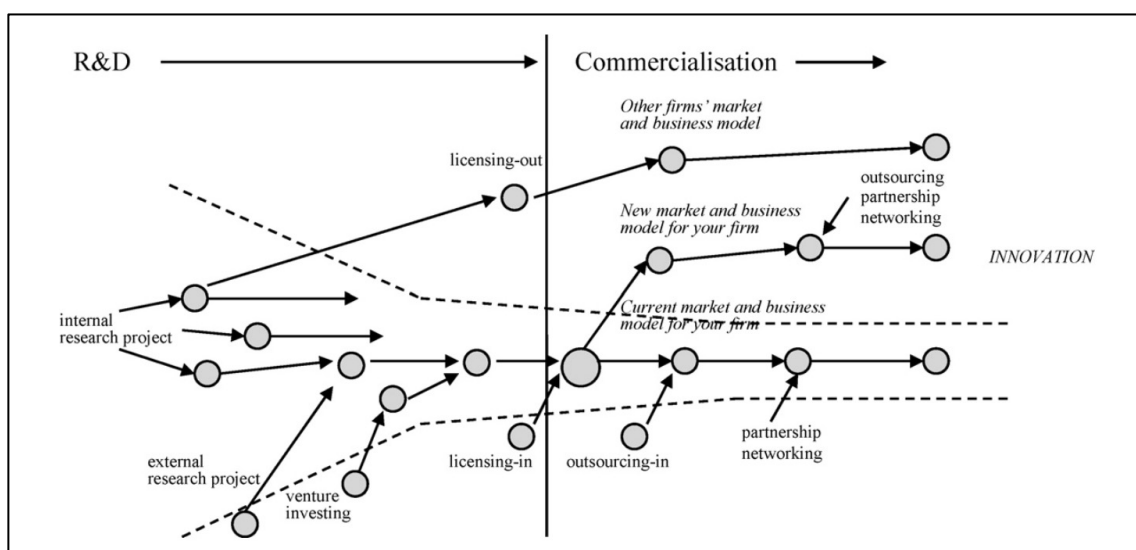
Figure 11 - Innovation process<sup>38</sup>

The innovation process can be divided into two parts:

- Technology exploration;
- Technology exploitation.

The first phase is generally applied to large corporations, while the second phase is the most applied by SMEs.

This is based on the fact that there are many more low-to-medium technology SMEs rather than high technology SME. The first in fact focus mainly on processes and services ranking on the second part of the process while it is obvious that SMEs that base their business model on technological innovations will apply the first phase. At this point, therefore, as mentioned above, precise networks are created based on how the company operates and therefore if it is exploration technology (R&D and HT-SMEs) or exploitation technology (commercialization and LTM-SMEs).



<sup>38</sup> Lee, S., Park G., Yoon B., Park J., Open innovation in SMEs - An intermediated network model, *Elsevier*, 2010

Figure 12 - Open innovation in SMEs

As summarized in the figure above, at the *exploration stage*, SMEs are more willing to implement internal research project, where it is possible, and also using external partnerships in order to maintain a high level of expertise in selected technological areas. As concern non-internal choices, they gladly create networks with institutions like universities because they feel more protected, fearing the possible dispersion of their discoveries to competitors. However, it is important to point out that some research has shown that not all companies can obtain good and same results from collaboration with universities. An analysis conducted on 2655 UK manufacturing firms has shown that companies prefer to proceed internally, wherever possible, without the involvement of external agents. As a second choice, the SMEs, whether equipped with R&D laboratories or without them, prefer to create external relations with suppliers of equipment, with clients and customers.

The number of companies that proceed with universities relationships are 27% and among them only 2% consider knowledge of great importance. Analysing in detail the industrial sector, and dividing the 2655 industries into 13 categories, it emerged as the chemical sector draw most heavily on universities in their innovative activities; in the electrical/electronic around 40% draw from universities<sup>39</sup>.

Given the uniqueness of each firm, it is important to remember how ties that are created with external agents must be unique and must be decided in such a way as to match perfectly with the proper characteristics of the firm. There is therefore no "general rule" that suggests the right way to go as the agents involved can be different also going from one country to another (just think to universities that provide different levels of teaching within the same country).

At this stage, considering the interdependence that exists between small and large companies, called "*dynamic complementarities*", also relations with big corporations are implemented. The non-internal R&D activities are therefore born to maintain the company's position regarding the technological areas.

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<sup>39</sup> Laursen K., Salter A., Searching High and Low: What Types of Firms Use Universities as a Source of Innovation?, *Research Policy* 33, 2004



The term non-internal, intends to include both external activities (licensing, R&D contracts, outsourcing) and quasi-external activity (strategic alliances). Non-internal activities, apart from the obvious benefit of exploring new areas and stimulating radical innovation, have the advantage of being a “reversible” investment<sup>40</sup>. In fact, the invested capital is smaller and therefore the risks are reduced. The outsourcing of R&D means that the company only gets the results and not the skills of the people involved in the job. Given their size, as said before, SMEs are very cautious about proceeding with external relationships and prefer to proceed with internal R&D wherever possible. But when they choose to work with others, they tend to act with a great deal of care.

A manager said:

“We use more than one supplier; our products are based on several boards. Each supplier produces only one board, because we don’t want any supplier to have access to our complete product. We might be able to get a lower price, but we don’t want to be in a position that the supplier is able to become a competitor. Non-disclosure agreements aren’t enough.”

So, if the benefits of openness are clear, it is also evident that this is not an easy and risk-free process. However, this does not discourage SMEs, which despite suffering more of this type of risk, they invest more than large firms in non-internal ties.

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<sup>40</sup> Narula R., R&D collaboration by SMEs: new opportunities and limitations in the face of globalisation. *Technovation*, 2004

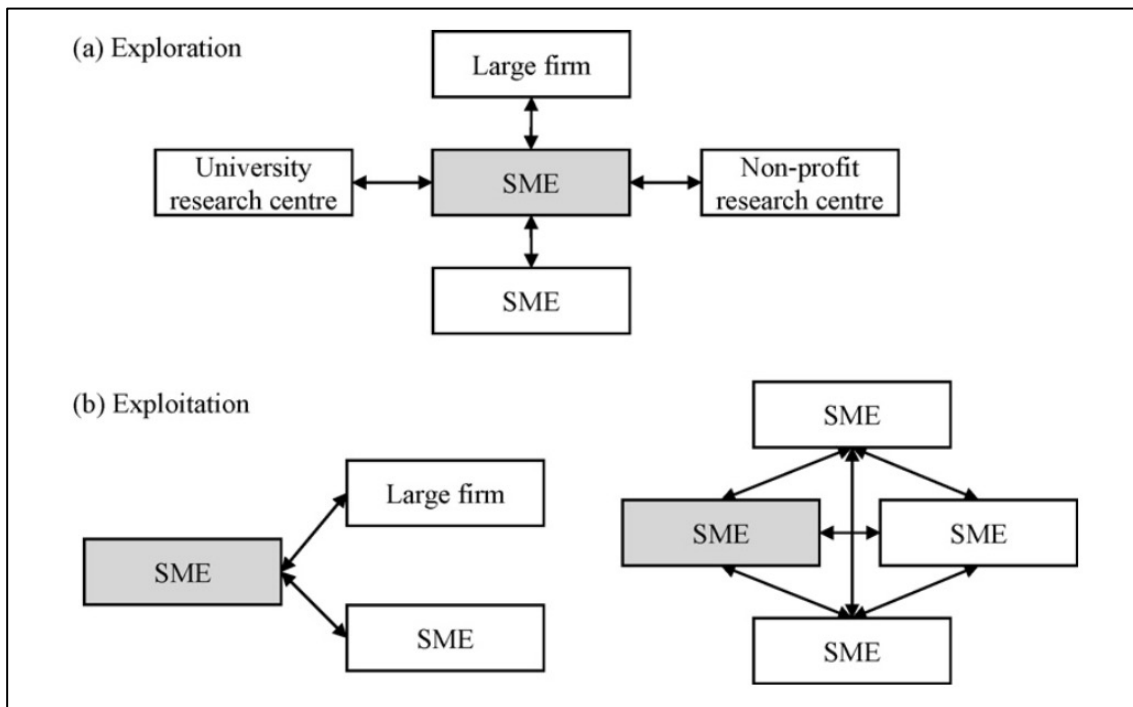


Figure 13 - Relationships of SMEs<sup>41</sup>

As regards the *exploitation stage*, many studies have highlighted the positive correlation between performance and strategic alliances confirming how SMEs can profit from valuable networks. The strategic alliances can be done with large companies but as shown by some researches this type of choice can be a double-edged sword: on one hand SMEs are attracted by the availability, both in economic and resources terms, by large companies, on the other hand this relationship can lead to a reduction in opportunities as they are led to share their knowledge. Furthermore, the relationship with large companies can help them become more flexible and thus to corrode the main advantage factor enjoyed by SMEs<sup>42</sup>.

An alternative model is to create a *network*.

It is defined as a specific type of tie that connect a group of person, objects or events. A network, if well-built and managed, can give many benefits to SMEs: it can reinforce the competitive advantage through the appropriation of information flows such as technology changes, market demands or strategic choices, from other firms. Moreover, network members, through the shared

<sup>41</sup> Lee, S., Park G., Yoon B., Park J., Open innovation in SMEs - An intermediated network model, *Elsevier*, 2010

<sup>42</sup> Narula, R., R&D collaboration by SMEs: some analytical issues and evidence, *Cooperative Strategies and Alliances*, Pergamon Press, 2002

development of innovation products or services can be positively influenced by the experience of others, appropriating useful information for future innovations. Usually the SMEs are specialised in small and specific areas with precise technologies and thanks to networks can thus widen their boundaries by successfully entering the wider markets and acquiring complementary resources, increasing core competencies and increasing the chances to compete with the biggest competitors.

But how is a network built? Resource-based theory suggests finding partners among those who can provide additional resources for mutual benefits. But it is obvious to consider how this process requires many skills and costs.

SMEs, unlike the large companies, have limited information sources and do not have the financial resources to obtain important information in order to make the proper choice. In fact, large companies can count on professional processes for scanning and monitoring technological environment in which they operate in order to find competitors and customers for their technology. Because of these difficulties, SMEs tend to build deep and exchange relationships only once they have set up a network.

It is therefore clear that is important to establish a role that can adjust this disadvantage. Some researchers, thus, suggests importance of the intermediary role.

The role of *intermediaries* is in fact fundamental in order to support SMEs skills in finding partners and eventually helping them to work better together. An intermediary is used to enable SMEs to maximize their chances of success in innovation processes, whether they are products or processes. Once it is consolidated the important role of the intermediary many policies and programs have been developed in order to support innovation for SMEs.

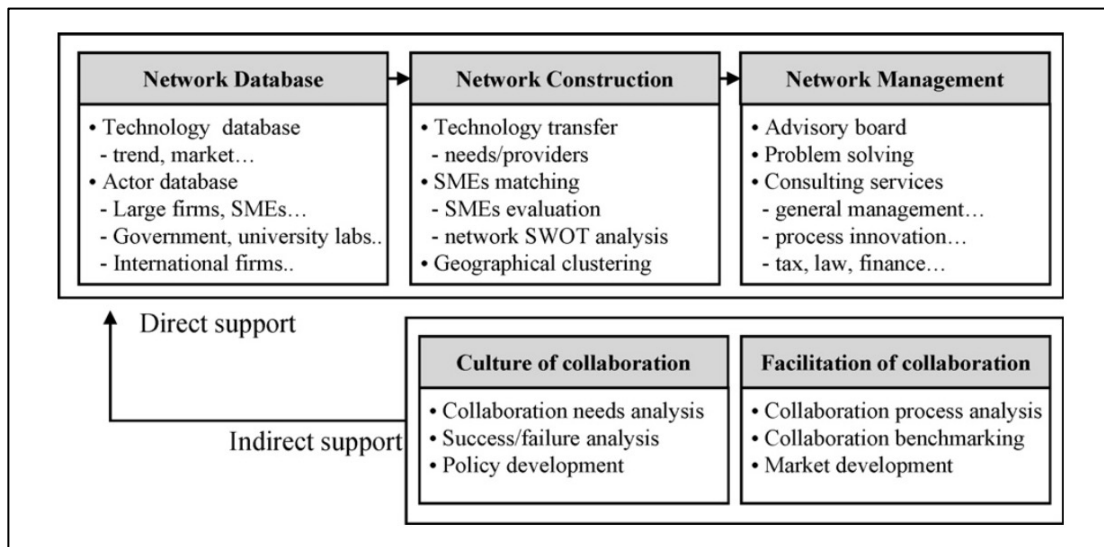


Figure 14 - The role of intermediary<sup>43</sup>

As can be seen from the figure above the role of the intermediary consists in three direct activities and two indirect actions.

The first role is to find the most suitable partners to work with. The intermediary then, after collecting and analysing information on technologies, markets and competitors, can therefore help SMEs in the research process.

Once partners have been identified, the second role of intermediary is of support. The intermediary helps the transfer of technology and helps to organize the technological management strategies, proposing a real network structure. At this stage, the SMEs usually show some resistance in revealing to their competitors the detailed information concerning R&D and at the same time the partners struggle to work if they do not have all the information necessary to evaluate the potential of the company in question. In this situation, the intermediary can have important information to evaluate each SME objectively and provide the other SME with the results of their analysis instead of the original technological information.

The third activity is the network management that supports the collaboration process acting as a consultant and helping companies to solve any problems. Finally, indirectly, the intermediary helps the development of the culture of collaboration and then facilitates its development<sup>44</sup>.

<sup>43</sup> Lee, S., Park G., Yoon B., Park J., Open innovation in SMEs - An intermediated network model, *Elsevier*, 2010

<sup>44</sup> Lee, S., Park G., Yoon B., Park J., Open innovation in SMEs - An

Through the presence of an intermediary, the traditional model based on the dependence of SMEs on large companies can be replaced by a more open, dynamic and flexible model with a positive influence on innovative performance. Large firm needs its own sources of innovation upstream of the innovative process. In this phase, large company is focused on the processes of internalization of technologies, *outside-in*. SMEs, on the other hand, act with the reverse perspective, they are interested in marketing their own technology, therefore with *inside-out* logic. Once a technology is produced, an SME then has a *sell* or *keep* decision in front of it. The first option is to sell the product on the final market. This leads the SME to have to support various complementary functions linked to production, marketing and sales. The second option is to cooperate with other companies becoming a supplier with a relationship perspective. In this case, the vision of complementarity between partners is strengthened. The inside-out processes can be realized through *out-licensing* or *revealing*. Through out-licensing processes, SMEs guarantee a direct economic return due to the sale of a technology. The disadvantage of this method is linked to a *paradox disclosure* for which a licensor who wants to sell a technology, rather than a simple product, must provide various sensitive information. Empirical evidence shows that most of these processes are successfully managed only by a minority of small and medium-sized enterprises. The second type of inside-out process is the revealing thanks to which the company reveals its innovation in the external environment without an immediate economic return, but with the objective of obtaining indirect benefits. Sometimes SMEs opt for a selective revealing activity by their own innovation to the public, in order to encourage a possible collaboration with other companies. The obvious disadvantage of activating these processes is linked to the difficulty of capturing the sought after benefits and that a competitor with better positioning, or with better assets, is able to appropriate the innovation.

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intermediated network model, *Elsevier*, 2010

It is good to remember that intermediate markets have existed for several decades, but initially they did not have a great development because they showed a high rate of inefficiency, while today there is evidence of their growth.

The causes of the inefficiency of these markets were represented by:

- Lack of information regarding the extent of the activity and the terms of exchange in these markets, which determined a great difficulty in assessing the technology available;
- The existence of pre-established schemes, which would have allowed to create a standard in the sector, within which to carry out these exchanges;
- The lack of information on available technology, which in turn determined the inability of companies to say what they might need.

This inefficiency has been attenuated thanks to the important activity carried out by the innovation intermediaries and the knowledge of the causes of this inefficiency serves to understand how the innovation intermediaries can favour the development of the *secondary market*. Secondary markets are markets within which the IP is exchanged. These secondary innovation markets allow the exploitation of each technology in multiple sectors through a multitude of companies, which by applying different business models successfully bring the idea to market.

In this case it is appropriate to report the example of Korea, a rich country in SMEs with high competitive technology and involved in many innovation activities, in which KICMS<sup>45</sup> was set up, an association established to facilitate collaboration among the Korean SMEs.

Research	Structuring	Consulting	Marketing
<ul style="list-style-type: none"> <li>• Needs analysis</li> <li>• Policy analysis</li> <li>• Supporting systems</li> <li>• Success/failure cases</li> <li>• Policy development</li> <li>• Process development</li> <li>• Benchmarking</li> </ul>	<ul style="list-style-type: none"> <li>• DB maintenance</li> <li>• Expansion of basis</li> <li>• International network</li> <li>• Geographical clustering</li> <li>• Training staffs</li> <li>• Session for policy</li> <li>• Presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Advisory board</li> <li>• Matching</li> <li>• SWOT analysis</li> <li>• General management, law, and finance</li> <li>• Production and process innovation</li> <li>• Funding and tax</li> <li>• Control and role</li> <li>• Conflict and resolution</li> </ul>	<ul style="list-style-type: none"> <li>• Market research group dispatch</li> <li>• Promotion</li> <li>• E-marking</li> <li>• Niche market</li> <li>• Overseas market analysis</li> <li>• International and domestic exhibition</li> <li>• Overseas buyers</li> </ul>

Figure 15 - KICMS's activities<sup>46</sup>

<sup>45</sup> KICMS was established in 2004, it counts 4415 firms in 2007.

<sup>46</sup> Lee, S., Park G., Yoon B., Park J., Open innovation in SMEs - An intermediated network model, *Elsevier*, 2010

An ICMS is a business model based on a horizontal structure of specialized SMEs. Instead of reproducing the entire innovative process as a whole, a firm that adopts this model deals only with steps where it enjoys a competitive advantage, leaving other parts of the process to the other SMEs with it collaborates.

SMEs thus enter into a mutual trust contract forming *CF<sup>2</sup>s* (Cross-Functional Consortium Families) and maximizing synergies and competing with large companies. The KICMS' activities are: 1) *collaboration research* in order to understand how to facilitate the collaboration; 2) support the creation of *collaboration structures* by collecting data; 3) provide *consulting* service during ties; 4) and finally, the hard part for SMEs, which is the *commercialization* of innovative technologies in the proper market.

In developing countries, such as India, there are no intermediaries because of institutional underdevelopment so there are groups that support innovation activities. These business groups often replicate the function of the intermediary institutions in developed markets in order to let that the group-affiliated Indian SMEs can obtain access to “internal capital markets” for funds and utilise group reputation for other essential external resources for innovation activities<sup>47</sup>.

The opportunities and benefits of a network are therefore clear. However, they can only be reached if accompanied by an internal change that can accommodate and amplify the resources that come from outside. In fact, it is particularly important to study the facilitation role of integrative managerial practices that involve strategic and operational actions in order to make innovative objectives effective and efficient. These integrative organizational practices intervene at different stages of the innovation process and refer to different stages of external knowledge sourcing. In the early stages, they identify future areas of innovation and support activities to access external knowledge; in the final stages, however, they allow the company to launch the individual innovation process, allowing the integration of internal and external knowledge flows.

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<sup>47</sup> Lodh S., Nandy M., Chen J., Innovation and Family Ownership: Empirical Evidence from India, *Corporate governance: an international review*, 2014

There are four internal organizational practices for innovation that help to support and enable the identification and alignment of external knowledge and which direct the procurement of external knowledge at a strategic and operational level: long-term investment activities, innovation strategy processes, innovation development processes, and innovation project control.

- 1) *Long-Term Innovation Investment.* The investment of long-term innovation is very explanatory of the company's character, in fact it gives an idea of its internal learning activities but also and above all of the desire to explore. It is important for a company to focus on long-term innovation with the development of projects whose purpose is to build long-term knowledge rather than producing short-term results. The long-term investment of a company is an important organizational tool for acquiring external knowledge, allowing SMEs to build sufficient internal knowledge and motivate companies to open up to external sources of knowledge;
- 2) *Innovation Strategy Processes.* An innovation strategy allows to find future business opportunities and permits the exploration of new technologies or solution principles or market functions. Of course, the ability to development an innovation strategy suggests the importance of strategic processes and managerial action. For innovation strategy making there are some skills that are more important than others like the ability to identify future business opportunities and also mapping them to internal competencies and capabilities. Innovation strategy processes help to classify and distinguish the value of new external information and knowledge and drive internal innovation activities such as idea management and innovation project management related to it.
- 3) *Innovation Development Processes.* Formal systems and procedures have become central in innovation management. The benefits of methodical procedures have been well documented in radical innovation examination. Such processes help managers organise and



integrate the elaboration of innovations in a structured way. The absorptive ability supports in integrating technological information, helps development, simplifies external and internal innovation flows management.

- 4) *Innovation Project Control*. To turn possible innovations into real value-creating results, SMEs need to focus on management that can measure innovation processes in an efficient way, with a strategic goal oriented. It basically means that some practical actions have to be done like: clearly define measures and targets for timing, resources, and ensuring the quality of individual innovation projects. Setting operational deadline and target for innovation plans is fundamental when introducing innovations. It is also important a great dose of project supervision in order to reconfigure activities and guarantees that innovation measures are within budget, or programme at a suitable level of performance. Thus, innovation project control can supervise and manage both external and internal knowledge also facilitating external knowledge sourcing<sup>48</sup>.

Concluding the network structure, which therefore provides intense relations and continuous exchanges between SMEs and other external agents, is the best solution to obtain benefits that would otherwise be out of reach for such small companies. However, this must also be combined with an internal structure that can fit internal knowledge flows with external ones.

In some situations, such as the Italian reality, these types of relationships do not occur spontaneously and naturally despite the theoretical advantages. Why? What are the brakes? Is the particular Italian structure an obstacle?

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<sup>48</sup> Brunswicker S., Vanhaverbeke W, Open innovation in small and medium-sized enterprises (SMEs): External knowledge sourcing strategies and internal organizational facilitators, *Journal of Small Business Management*, 2014



## Italian SMEs and Innovation

“The huge load of traditions, habits and customs that occupies most of our brain ballast impetuously the brightest and most innovative ideas.”

*Josè Saramago*

### 3.1 Picture of Italian SMEs

In the overwhelming majority of production systems, the PMI is numerically prevalent compared to large companies but in Italy this phenomenon takes on particular dimensions.

Italian small businesses are born from a very particular reality. After the Second World War, the United States through the *European Recovery Program*<sup>49</sup> supplied machinery and raw materials with the aim of helping Europe's economic recovery and creating a hostile environment for the possible expansion of the Soviet economy. In Italy, 1950-1970, there was a growth especially in the automotive, iron and steel and household appliances sectors. In these years the number of SMEs grows significantly because on the one hand, there was the generation of small production units from parts of large companies that after the sixties stopped the process of dimensional growth that occurred in the period between the two wars, and on the other hand there was the transformation of craft activities into autonomous enterprises. In this scenario, the model of the districts is established as an alternative to large companies.

From the beginning of the 90s, Italy differs with the other European countries by three fundamental characteristics:

- 1) *dimension*: where large companies are notably subdued compared to small businesses;

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<sup>49</sup> *Marshall plan*, it allocated over \$ 14 billion over a four-year period.

- 2) *specialisation*: where the companies were mostly specialised in traditional sectors, leaving out the most innovative ones, demonstrating a much lower competitiveness in this field than the European countries;
- 3) the presence of a model of *control based on families* and pyramid coalitions in the private sector.

In Italy, small and medium-sized enterprises are 99.9% with 99.4% made up of micro and small enterprises that employ 66.1% of workers. Mid-sized companies make up 0.5% in 2016 and employ 12.5% of employees. Large companies represent only 0.1% and employ 21.4% of employees<sup>50</sup>. In addition, the share of self-employed workers is among the highest among European countries, suffice it to say that almost one in three people is independent, three times the European average.

From the point of view of specialization, Italy shows a predominantly manufacturing inclination compared to other European countries. Among the services, transport and telecommunications are relatively more present, and Italy stands out for its marked specialization in durable consumer goods and intermediate goods. From the point of view of competitive performance, Italian SMEs have reached levels significantly lower than those of the major European countries, leaving out Spain. The overall lacklustre results of Italian production system are likely to be affected by the significant presence of micro-enterprises, characterized by lower capital intensity and consequently lower productivity.

As the number of employees increases, the performance of manufacturing companies improves compared to that of other European companies and for medium-sized companies, above-average productivity is also observed. However, the overall result remains strongly influenced by the overwhelming presence of the miracle enterprises.

The profile that emerges up to here is not of a strongly backward country, but it cannot deny the existence of some alarm signals that suggest to intervene so that the performance of the Italian productive system can be strengthened. The

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<sup>50</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

first sign of attention is the serious decrease in competitiveness. A second element of attention arises from the comparison with the more traditional Italian competitors where France, Germany and United Kingdom obtain more satisfactory performances. The most evident fact is the persistence of the specialization model. In fact, even in terms of exports, the Italian prevalence is evident in the footwear, furniture, household appliances, ceramic glass and non-metallic materials for metallurgical products. In short, on the one hand, the traditional *made in Italy* centred on style, design, fashion, quality and on the other hand of the instrumental mechanics. Moreover, Italy is not specialised both in sectors characterized by oligopolistic structures capable of guaranteeing economies of scale, and in sectors with a high level of research and development.

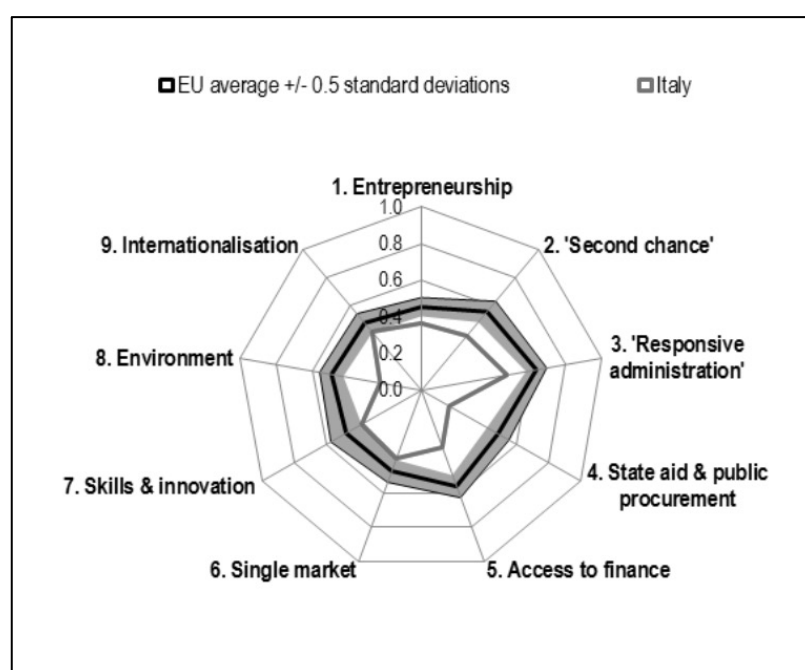


Figure 16 - Italian data about nine SBA areas<sup>51</sup>

These low performances are confirmed in Small business act sheet<sup>52</sup> where Italian SMEs prove to be below the European average on all nine areas: 1)

<sup>51</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

<sup>52</sup> The Small Business Act (SBA) is an overarching framework for the EU policy on Small and Medium Enterprises. It aims to improve the approach to entrepreneurship in Europe, simplify the regulatory and policy environment for SMEs, and remove the remaining barriers to their development. It is based on *think small first* principle. It is meant to be a guiding principle for all policy

entrepreneurship; 2) second chance, which is the possibility of a honest entrepreneur who have gone bankrupt to get a second chance; 3) responsive administration, which means that public administration is responsive to SMEs needs; 4) state aid and public procurement; 5) access to finance; 6) single markets; 7) skills and innovations; 8) environment and 9) internationalisation. The various points taken into consideration in the Small Business Act are closely linked each other but the next paragraphs of this thesis will focus mainly on the delay of Italian innovative performances and their causes.

### **3.2 Innovation and Italian SMEs**

As state in the first chapter, innovation is an important factor for progress and for an economic recovery. As reported in the Small Business Act sheet, Italian SMEs presents also a delay in many variables of *innovation areas* and this raises an important question: Is there innovation in Italian SMEs?

Like the European SMEs, even the Italian ones, lead what is called an "innovation without research"<sup>53</sup>.

The SMEs, as written in the second chapter, are in fact more inclined to implement *informal* rather than *formal* innovation activities for this reason an analysis based on R&D expenditure items could erroneously lead to say that the SMEs are not innovative, cutting out of the statistics all those daily innovative processes that the SMEs implement unconsciously. Looking at the Italian case, the production system is mainly specialized in traditional sectors characterized by a low innovation rate with low average levels of human capital and with insufficient organizational and managerial skills that justify the overall unsatisfactory data. The focus should be on the direction that should be taken and on the initiatives to be taken to favour a repositioning of the overall system, not by eliminating it but starting from the current conditions and the skills that the system has developed up to now.

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and law-making activities. It requires policymakers to take SME interests into account at the early stages of the policy-making process. The principle also calls for newly designed legislation, administrative rules and procedures to be made simple and easy to apply.

<sup>53</sup> Hall B.H., Lotti F., Mairesse J., Innovation and productivity in SMEs: empirical evidence for Italy, *Small Business Economics*, 2009

However, this does not imply that a company must compete in sectors that have nothing to do with its production history, but rather that the know-how must be oriented in such a way as to point towards other directions and innovative strategic objectives promoting a coherent development to this orientation.

The fact that small and medium-sized Italian companies are mainly active in the manufacturing sectors of furniture, clothing and automation is not considered an issue, but rather the problem is that the know-how developed is not directed towards innovation in these sectors. However, the revival of the Italian system must focus not only on research and development but also on improving the ability to translate innovations into real uses on the market and more generally on the search for economically relevant applications, including existing technologies. The case for example between Norway and Japan is explanatory of this. In recent years, Norway has seen a strong increase in labour productivity, a result obtained mainly by leveraging the application of technologies to the various sectors of the economy and by paying particular attention to the reorganization of the service sector. The interesting thing is that Norway's effort in R&D spending is at minimum levels but in this country the productivity of the hours worked is among the highest in the world. On the contrary, Japan has a high research and development intensity in many sectors, particularly in the field of information technology. However, the application of technological know-how and advances resulting from high R&D investment is very low particularly in services that is the sector that occupies the vast majority of the Japanese workforce. For the overall growth of a country it is therefore more important to increase the productivity of the weak sectors (*traditional* in the case of Italy) rather than moving ahead the frontier of the most advanced sectors; this consideration has a particular relevance for the decisions of competitive repositioning of the Italian production system<sup>54</sup>.

Over time link between SMEs and innovation has evolved giving rise to different configurations. At the beginning, there was the classic model centred on the traditional district, portrayed by a strong territorial characterization and by the dynamics of collaboration with local actors, then it was replaced by the

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<sup>54</sup> Gambardella A., *Innovazione e sviluppo. Miti da sfatare, realtà da costruire*, Egea, Milano, 2009

consolidation of models of innovation centred on the role played by leading companies. In this case, the innovative action of SMEs acted in the context of directions and flows imposed by some companies that assumed the role of integrators of the innovative contributions generated by a network of other companies. However, this configuration has two risky areas: the first area is to lose all contact with the final market and to not be able to catch the signs of change coming from the external environment in time; the second area of risk, on the other hand, is developing dependency on other companies and, in particular, on leading companies, losing the *dynamic capabilities* that characterize small and medium-sized enterprises. In general, these two configurations tend to develop, from the point of view of SMEs, a *reactive* approach (sometimes even limiting it) rather than pushing companies to take a *proactive* approach. With reactive capacity is meant the flexibility and the ability of SMEs to adapt according to market changes while proactive approach means an attitude that involves the SME in identifying and understanding first of all what is the new competitive game based on direct analysis of the external environment. This type of behaviour will allow the company to develop a commitment to innovation and to act with greater control of change by managing it in a conscious manner.

In light of this, the third and much more suitable configuration of the relationship between innovation and SMEs is the model of open innovation. This possibility depends on the company's ability to access innovation networks and to oversee innovation-oriented business models, not only on an operational but also a strategic level. As already mentioned, in these ways the SMEs can on one hand capitalize their innovative capacity on the other hand, sharing with others the risk linked to the innovation itself.



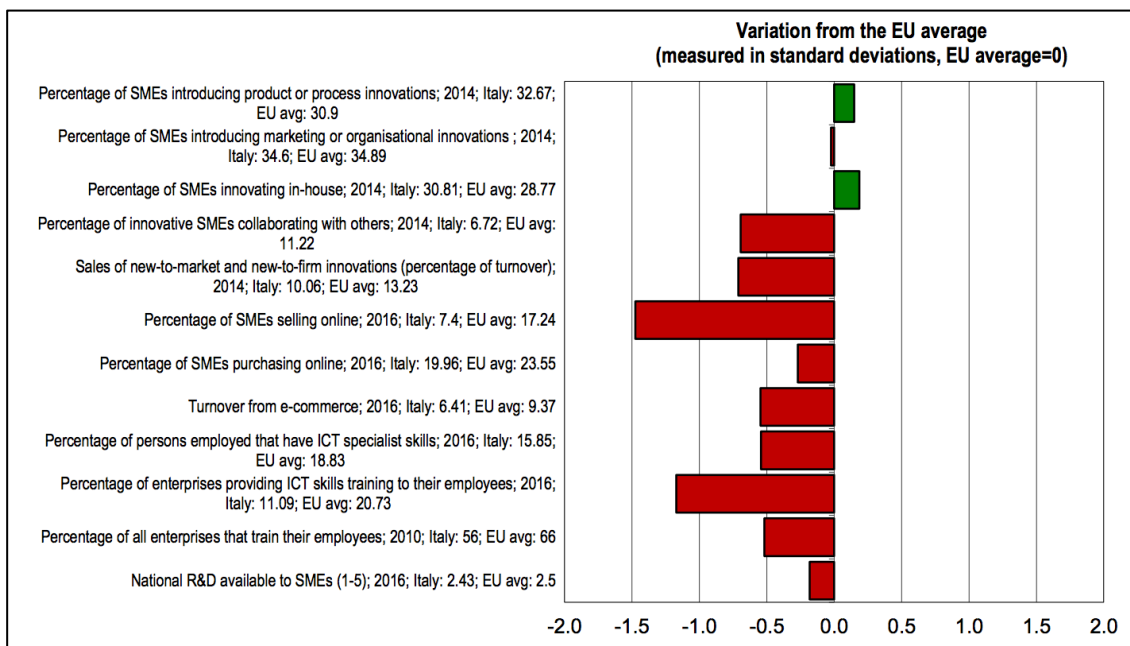


Figure 17 - Skills and Innovation<sup>55</sup>

The chart above shows the heading "*skills and innovation*" of the Small Business Act. It is curious to note that the values taken into consideration implicitly underline the importance of open innovation by highlighting some variables such as: "sales of new-to-market innovations", "percentage of innovative SMEs collaborating with others"<sup>56</sup>.

From the data, it is evident how the Italian SMEs show a lack of propensity for open innovation with a high percentage of in-house innovations and a lack of collaboration with other external agents. Since, as described in the second chapter, the open paradigm shows numerous benefits for SMEs, why does not this happen?

The fact that open innovation brings benefits depends on a series of factors that are scarce in the Italian reality: first of all, the centrality of the skills of the entrepreneur, his/her competence and the management culture.

### 3.2.1 Management culture: a family matter

In many small and medium-sized enterprises the owner is also the manager of the company and it is very likely that the degree of organizational formalization is rather low. Furthermore, the entrepreneur often finds himself

<sup>55</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

<sup>56</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

acting within a cognitive and emotional system that can strongly influence key decisions.

The strong connection between personal experience and company history, family ties and their active participation in the company are typical features of small and medium-sized Italian companies.

They are able to exert an important influence on the processes of analysis of the external environment and on the choices of strategic positioning in a very different way compared to large companies. In fact, in the latter the key decisions are taken in a more formal context and managerial roles are assumed by specialists with skills and experience; on the contrary, in the SMEs the decisions are taken by a single individual, to the limit supported by some family members, who centralizes on his person property and management<sup>57</sup>.

This enormous problem highlights the gap that exists between SMEs that are able to take a more strategic orientation and organize resources with a view to innovative goals and those SMEs that are too influenced by the personal characteristics of the owner and entrepreneur<sup>58</sup>.

An empirical study has put in relation the personality of the entrepreneur with the strategy, the structure, the decisional processes and the organizational performance<sup>59</sup>.

The dimensions of the personality taken into consideration were three:

- 1) *flexibility*: as the ability to adapt the individual's thought and behaviour. Flexible: adventurous, informal, confident; less flexible: thoughtful, cautious, industrious;
- 2) *need for achievement*: dimension for which people set challenging objectives and prefer to worry about a problem on their own.

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<sup>57</sup> Becht M., Roell A., Blockholdings in Europe: an international comparison, European economic review, 1999

<sup>58</sup> Hambrick D. C., Mason P. A., Upper echelons: the organization as a reflection of its top managers, *Academy of management review*, 1984

<sup>59</sup> Miller D., Toulouse J.M., Chief executive personality and corporate strategy and structure in small firms, *Management science*, 1986

- 3) *Locus of control*: dimension that distinguishes between internal control, propensity to consider itself able to influence events with its own actions, and external control, a tendency to feel at the mercy of forces that cannot be influenced.

What emerged from the intersection of these three dimensions of personality and the four organizational dimensions confirmed that there is a significant correlation between the entrepreneur and the characteristics of the organization. This becomes fundamental when it referred to innovation because it is a risky path and it led to a change not only for the company but also for the entrepreneur himself/herself.

The predisposition to an open innovation process derives not only from the weighting of costs and benefits but also from factors closely correlated with the personality of the entrepreneur.

Along with personality traits and motivation, it is also necessary to evaluate the skills that he/she is able to activate for the management of the company and of any growth. In fact, several studies highlight the challenges of competence development that lie ahead to the entrepreneur who decides to pursue an innovation-oriented upgrade and all converge in demonstrating the importance for the innovative SMEs of a professionally structured managerial approach<sup>60</sup>.

Organizational growth oriented towards innovation is therefore influenced on the one hand by the personality, motivations and skills of the entrepreneur and on the other by the management culture. Which are the areas to which it is necessary to orient the evolution of the management culture in the SMEs in order to create a propaedeutic environment for open innovation?

There are three areas:

- 1) the interpretation of the environment and the definition of the strategic fit: the external environment influences the performance of companies and offers them a mix of opportunities and challenges

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<sup>60</sup> Fernandez-Ortiz R., Lombardo G.F., Influence of the capacities of top management on the internationalization of SMEs, *Entrepreneurship & Regional development*, 2009

that need to be read and interpreted. On the basis of the environmental analysis, the entrepreneur is then responsible for defining the ways in which the company will have to deal with the environment itself. It is therefore important that the entrepreneur devotes himself to the analysis of the market, not neglecting this important factor;

- 2) Entrepreneurial Orientation (EO): the entrepreneurial orientation of the company defines its degree of engagement in innovations, of orientation to the assumption of risks, of proactivity and the extent to which it manages to keep the competitors under control<sup>61</sup>. Great models of EO refer to companies recognized in the market as innovators, able to express a proactivity that puts them in a competitive advantage over their competitors. In the case of SMEs, it is clear that the entrepreneur is the main (often the only one) responsible for setting up this aggregate indicator;
- 3) the creation, management and development of resources: It can be organized in three ways:
  - a) *Resource based view*: identifying the value in possession among the resources.
  - b) *human capital*: with reference to the qualities of the entrepreneur and the workforce of the company as key resources. Innovative SMEs know very well the importance of recruiting, motivating, retaining and developing highly qualified personnel in order to express innovation-oriented attitudes, nevertheless in Italy, looking at the SBA, it is seen how the companies that train workers are much less than the European average (Italy avg: 56; EU avg: 66);
  - c) *network*: resources that come from initiatives that create links between companies, institutions and even within the company itself. Inter-organizational networks are a strategic choice of

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<sup>61</sup> Miller D., The correlates of entrepreneurship in three types of firms, Management science, 1983

particular importance because it allows small and medium-sized enterprises to access resources that it would not be able to develop internally while ensuring considerable flexibility and significantly enhancing their capacity for growth<sup>62</sup>.

In most cases, however, the entrepreneur acts in a flow of family influence capable of generating effects on management processes. This is very common in the Italian reality as most of the SMEs show a "family business" structure. In general, this expression refers to cases in which one or a few families linked by kinship, affinity or solid alliances hold a share of risk capital sufficient to ensure control of the company. In these firms, the entrepreneur is therefore the leader of a coalition composed of members of his family (natural or extended). This composition can be considered as one of the characterizing elements of the Italian production system as a whole.

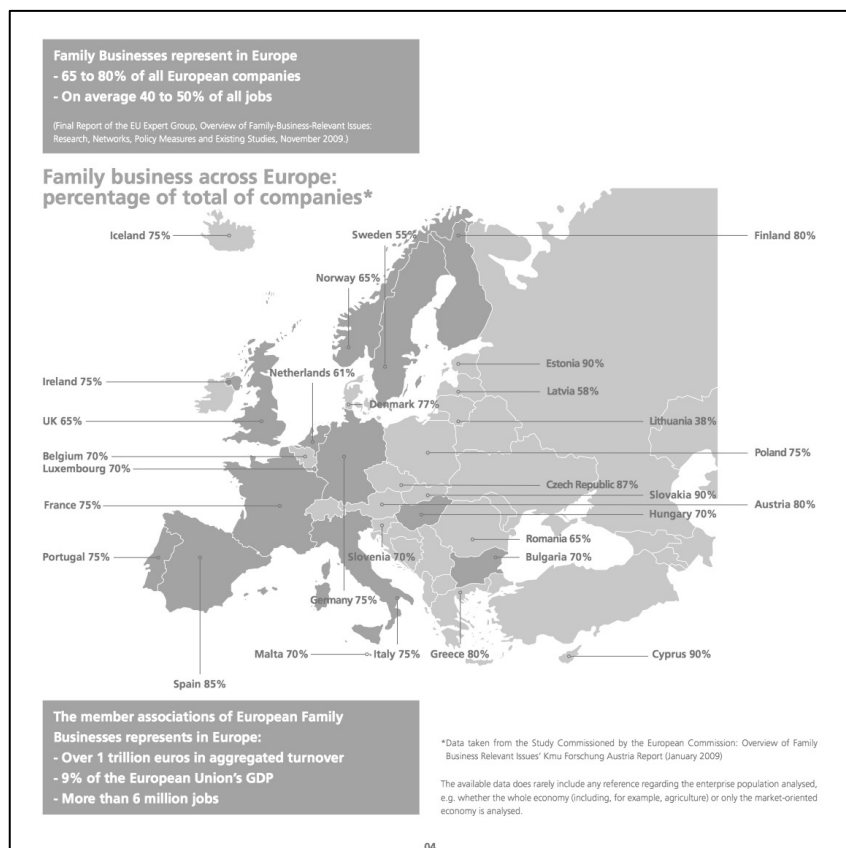


Figure 18 - European Family business: percentage of total companies<sup>63</sup>

<sup>62</sup> Powell W. W., Koput K. W., Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology, *Administrative science quarterly*, 1996

<sup>63</sup> Families in business for the long term, *European Family Business (EFB)*, 2008

As it is shown in the image above, about 75% of Italian companies are family businesses, almost in line with other European countries. It is therefore important to consider the influence of the family on entrepreneurial action, on management processes and decisions, on organizational development and on generational change. What is more characteristic of the Italian situation comparing with other countries is the composition of management, where in 66% of Italian companies are made up of members of the family, compared to 26% in France and 10% in the UK. In Italy, in fact, the link between business and family is much stronger than elsewhere, giving rise to a general aversion to transferring ownership outside the family. The prevailing orientation is in fact in the direction of a strong involvement of family members not only in the ownership structure but also and above all in the decision-making processes and in the composition of the workforce<sup>64</sup>. The significant degree of involvement of family members in the company is particularly evident in cases of company growth. The financing of growth and above all also the recruitment of personnel is sought in the family environment: on one hand this strengthens the bonds between business and family, with all the benefits of commitment that follow, but on the other hand makes it increasingly delicate to open the company to managers unrelated to the family. In fact, the higher the level of organizational idiosyncrasy, the more it will tend to favour the appointment of a family member even in cases where his/her competences are lower than those of an external manager<sup>65</sup>. It also generates a reverse phenomenon for which even qualified managers prefer to work for non-family companies for the greater opportunities they offer (career and personal growth).

Finally, a qualitative analysis of the Italian SMEs seems to confirm the thesis that the great gap between successful firms and those in difficulty is due to the correct evolution of managerial culture which foresees an open attitude and a propensity to functional analysis of the environment, an entrepreneurial

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<sup>64</sup> Corbetta G., Montemerlo D., Ownership, Governance and management issues in small and medium-size family business: A comparison of Italy and the United States, *Family business review*, 1999

<sup>65</sup> Lee K.S., Lim G.H., Lim W.S., Family business succession: appropriation risk and choice of successor, *Academy of management review*, 2003

innovation orientation and the creation, management and development of resources. It is therefore clear that the propensity to closeness by the Italian SMEs towards the introduction of an external manager is also reflected in a closure towards open innovation that provides links with external agents, including competitors.

### **3.2.2 Network**

In recent years the issue of the organization of SMEs has become of greater interest and it has been the subject of research due to the emergence of a new dimension of *supra-enterprise* or *inter-company*. The concept of *network-enterprise*, which today is widespread, has actually matured slowly with the evolution of the industrial production structure since the end of the 70s. Studies of Industrial Economics which focused on the aspects of small companies have the merit of having made known to the whole world a typical Italian production system in which smallest manage to challenge the biggest by affirming brands, products and styles such as *made in Italy*.

From the mid-Nineties until the crisis of 2008-2010 there has been a deep reorganization of industrial cycles that involved both the advanced and developing countries with the creation of global production networks. It follows that the SMEs are able to enter into large supply chains with low transaction and information exchange costs. These global production networks are the evolution of the districts and are organized by dividing the activities into three segments:

- 1) *Core activities*: which are the activities maintained under the direct control of the company because they are considered distinctive and a source of competitive advantage and are coordinated by *hierarchy*;
- 2) The most strategically relevant activities that can influence the success and competitive advantage that are distributed among those external suppliers or customers with whom they cooperate and are therefore coordinated by *network*;

- 3) Less significant activities because they are more standard and more accessible, which are sought from time to time on the market and are coordinated by *Market*.

The network is defined by a stable link between autonomous parts that, thanks to their good relationship, produce a value (a utility for the customer) greater than what they could achieve by acting on their own behalf, without the resource-network intervention<sup>66</sup>.

These new networks are based on a balance between common interests and the interest of individuals who are no longer governed by strong central decision-makers with powers of command but generates a balance that can very easily change. This is not a fragility, rather studies show how networks tend to persist for reasons linked to the return of specific network investments and that is all those investments that connect a company to the network. Overall, the network organization systems that derive from it appear to be endowed with more flexibility and adaptability.

Companies are brought into the network because they derive real economic benefits, they can in fact use the external relationship with the other members to improve the production of value for the end customer and to measure the competitive position. In addition, companies can derive numerous benefits precisely from the variety and differentiation typical of networks. The AIP research (Italian Association for Industrial Policies) shows how networks can be classified from different points of view: purpose, nature, content of relationships, etc. The variety of these points of view makes it impossible to construct theoretical typologies in order to classify them, limiting itself to providing a classification according to the “key idea around to which the network is born and organized in the course of time”.

Nowadays, network is a very recent concept, an original paradigm with considerable strengths, to enable Italian SMEs to compete effectively in the globalized world. The possibility of networking and leveraging external economies is a priority for SMEs that alone would not have the strength to fuel growth that now requires international dimensions both in sales networks and in production systems. It is therefore operating on the network relations,

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<sup>66</sup> *Associazione Italiana Politiche Industriali* (cit. anno 2008)



on the external economies and on the supports offered by the territory to the SMEs that it is possible to intervene with public policies to accelerate the industrial system. But it is also the context of Italian SMEs not to help access to innovation.

### **3.2.3 Institutional regulation and Italian SMEs support**

Among the causes that influence the low innovative performance of Italian SMEs we have the environment in which they operate. First of all, there are factors related to the demand and therefore the perceived market size and consumer preferences. Secondly, there are factors related to the support structures, referring to the institutional regulation system but also the direct and indirect costs related to the innovative activity that in Italy are higher than the other European countries and tend to discourage companies from investing in research and development activities.

This order of factors also includes the well-known problem of the capital market, which in Italy is strongly centred on the banking system. This feature does not constitute an incentive to invest in research and development. While in the other economic systems there are widespread specialized agents (first of all *venture capitalists*) able to intercept, evaluate and finance R&D projects, in Italy the rarity of these figures tends to generate less opportunities for access to credit, which has repercussions on the whole system of companies. In particular, however, for SMEs that, compared to larger ones, have an economic and financial structure that is not intelligible from the traditional rating tools adopted by the banking system.

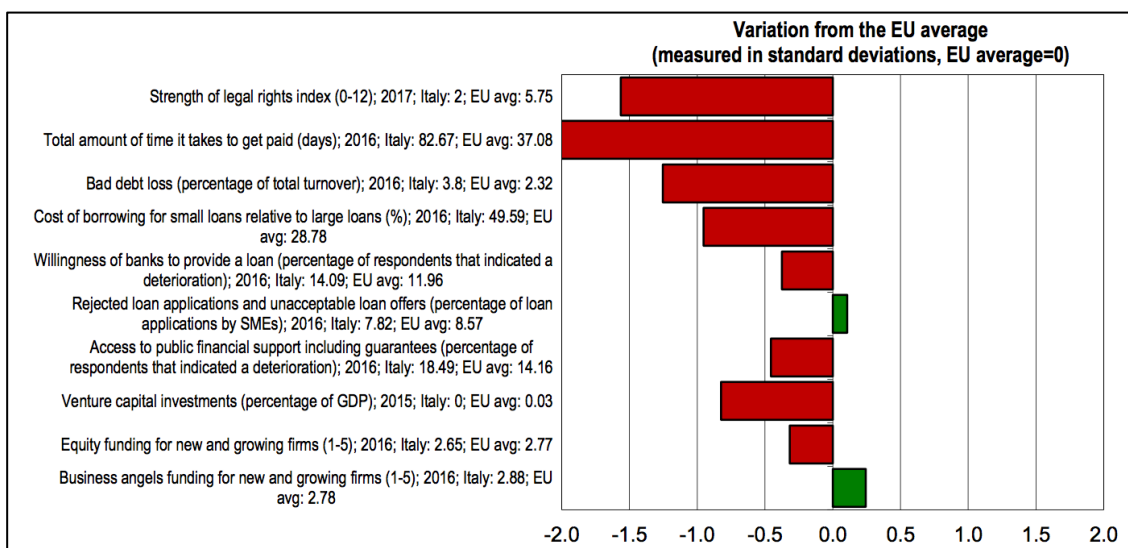


Figure 19 - Access to finance<sup>67</sup>

As confirmed in the graph, the difficulties in accessing credit and finance are still high in Italian companies, especially for smaller firms due to: restrictions on bank loans; low availability of private risk capital and a still small risk capital market. The cost ratio for small loans compared to large loans has been progressively diverging to small business disadvantage since 2008. In recent years, however, public policies have tried to improve the situation in the country through funding programs, facilitating access for SMEs to the credit and capital markets through dedicated funds<sup>68</sup> or incentives for investors (tax exemptions), improving liquidity flow situation (incentives for rapid asset depreciation and fiscal measures to increase investment), as well as to encourage the development of equity financing and free up resources for growth. A credit fund was also set up for SMEs that are lagging behind in payments.

In March 2013, the Ministry of Economic Development also reformed the corporate incentive system to drive innovation to competitiveness and support investments in technology. Business incentives are financed by the Sustainable Growth Fund<sup>69</sup>, including resources for technological innovation to promote strategic research projects and increase production.

The new strategy is based on three pillars:

<sup>67</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

<sup>68</sup> *Fondo Italiano di Investimento*

<sup>69</sup> *Fondo per la Crescita Sostenibile*

- 1) to promote investments;
- 2) to favour access to capital markets;
- 3) promoting innovative entrepreneurship.

In previous years, other techniques have been adopted to try to increase investment in research and development and innovation among companies, especially by turning to SMEs. Examples include tax credits to stimulate investment in machinery and capital goods, subsidized SME credits and micro businesses to invest in hardware and software and digital technologies<sup>70</sup>.

### **3.3 A global look**

Unfortunately, a large part of companies, around half of the exporting structures which have come to the crisis of 2008-2009, still operating on traditional products and markets and is still awaiting events. This large slice of the market therefore weighs on the production performance of the country, especially as regards innovative ones.

Innovation is certainly not only due to R&D expenditure and investment, since this type of investment is particularly important for the large multinational company. On the contrary, for a production structure like the Italian one, characterized by the dominance of SMEs, this parameter is only one of the indicators of effective innovation. Consequently, in order to evaluate and increase innovation, it is above all necessary to consider and act on applied research and product innovation linked to market and customer and therefore it is necessary to operate in at least two directions.

In the first place, the paradigm of *open innovation* is able to broaden the opportunities for exchange between companies and the external environment and therefore to suggest different ways to develop innovation.

Secondly, it is necessary to mobilize *resources*, mainly human but also organizational and process, indispensable for covering the various possible paths of innovation that are within the reach of Italian small and medium-sized enterprises of *made in Italy*. Therefore, if large expenses in R&D do not count, there is instead a great importance of SMEs ability to mobilize innovative

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<sup>70</sup> 2017 SBA fact sheet Italy, European Commission, Luxembourg, 2017

resources and to make available these resources or common assets to companies that are part of the territory. The issue of increasing the rate of innovation is therefore a matter of mobilization of resources both within the company and on the territory, to create those commodities that trigger and support the innovative process. In the case of SMEs, these resources are mainly linked to the people knowledge, technical-scientific and managerial skills and to availability of equipment and systems that are not too much expensive. Therefore, the costs of an adequate mobilization of resources could still be accessible to Italy despite the great financial crisis it is going through. In any case, the mobilization and the related investments must be partly activated by the companies and partly by the public system and it is therefore necessary to arrive at a convergence of opinions and decisions between public and private actors to identify lines of work and to activate necessary actions. It can therefore be concluded that the launch of a widespread innovation process in small medium-size enterprises requires a convergent set of efforts from both public actors (State and Regions) and private actors (companies and entrepreneurial families). In this last sense, it is asked to entrepreneur an expertise profile and areas of specialization that today are dramatically different from the configurations of entrepreneurship and management culture required by 70s and 80s.

In recent years, the need to evolve entrepreneurial culture and family ownership system become a priority matter for Italy. This evolution of internal management skills will allow application of network system which will contribute to the development of SMEs in "bigger" and more innovative companies. In fact, networks are better suited to companies with family culture and can bring a breath of innovation, despite the most backward part of SMEs showing a *wait-and-see* approach to both innovation and networks. It is therefore fundamental to aim at a common effort to build stronger networks, that should be more aware of their mutual relations and more committed to growing useful external economies.

## Conclusion

Numerous researches have emphasized the importance of innovative processes as they are relevant factors for growth and development of economic systems. For companies in particular, innovation is great path to create new products, new processes and new ways of organization and, ultimately, an opportunity to increase their profits and their market shares, in order to acquire a long lasting competitive advantage.

As described in the first chapter, the concept of innovation has evolved over time and it moved from *closed innovation* to *open innovation*.

Open innovation includes a series of practices that allow an organization to capture new knowledge and information outside the company boundaries.

This can greatly increase the innovative and learning potential, and also increase the company's competitiveness. Certainly, the implementation and management of an open innovation process is not a simple task for companies and poses particular challenges especially for SMEs.

In the second chapter the application of this paradigm to small and medium enterprises was studied, an issue still low on literature but still analysed during these years. Indeed, SMEs represent an important and often neglected actor in the global economy, particularly in the Italian context. Small and medium-sized enterprises, especially because of their small size, seem to be particularly suited to obtaining great advantages from the adoption of such practices, in particular the Italian reality could represent the ideal terrain for the practical application of open innovation. In fact, the creation of links with external agents would lead to *networks* creation which would seem more acceptable to Italian SMEs often characterized by a family business structure. In fact, the road of mergers and acquisitions, which is the main road for other economies growth, does not find fertile ground in Italian cultural reality.

In reality, however, the Italian SMEs show a low propensity to relate with external agents and therefore to open innovation, compared with other European countries and these results guide the search for possible causes.

As written in the third chapter, there are several causes both endogenous and exogenous. It therefore follows that in order to generate the start of a SMEs

widespread innovation process there must be a forces union both from public and private actors.

This means that on one hand policy-makers must make more effort to help SMEs effectively (for example, by helping to access of credit), on the other hand, even the family businesses themselves must evolve, mainly with regard to internal management culture.

We are therefore in a phase of evolution and major changes where, thanks to the constant increase of graduates people we expect a spread of skills even within smaller companies; on the other hand it is good to consider that if half of the Italian SMEs is crossing difficult phase and shows a wait and see approach, the other half is made up of excellent SMEs who have been able to maintain an innovative approach with a fair amount of risk that has allowed to keep the name of Made in Italy high all over the world.

The hope, therefore, is also that virtuous companies push most uncertain SMEs towards an opening that simultaneously generate an internal and external innovation flows that enrich firms and also the whole society.

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