



Future trends and Italian SMEs

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Abstract: The stagnation of the domestic market has brought the majority of the small and medium-sized enterprises (SME) to their knees, leading them to reinvent their way of doing business and find new strategies in order to survive and grow when the environmental conditions are deeply changing. On the one hand, new trends create a strong disruption on a structural level among the productive fabrics, but on the other hand, they represent also an opportunity, which opens new scenarios and new possibilities for the relaunch of SMEs.

Among the most important challenges for Italian SMEs is internationalization, which is the possibility for enterprises to trade their goods not only on the domestic market but also on the foreign markets trying to find new opportunities to obtain some advantages. This is a very complicated process, traumatic and challenging in term of resources, but the possibility to have a genetic patrimony and a productive value, as the ones of the "Made in Italy", gives to the products of Italian enterprises a high level of competition and strong differentiation, making this process more accessible.

The growth and competitiveness of enterprises, in particular SMEs, increasingly depend on the ability to apply new knowledge, working methods, and technologies as well as on the opportunity to participate in the commercialization of research developments in order to create new products, services or processes. Therefore, companies should strive to benefit from the opportunities and competitive advantages that innovation brings. SMEs play an important role in economic growth and provide most of the new jobs in Italy.

Within the framework of this paper, the insight into the SMEs internationalization process is presented. The article provides an analysis of SMEs in the process of internationalization. Besides it concentrates on the new threats and opportunities represented by the new industrial revolution - Industry 4.0. Analyzing the impact of Industry 4.0 on the internationalization of Italian SMEs, the authors explain the solutions that are being used and the ones that should be taken.

Keywords: SME, Industry 4.0, digitalization, investment, reshoring, manufacturing, customization, innovation.

1. Introduction

The international economic context in which the Italian enterprises are working is strongly integrated and inter-dependent. The nature of the competition is radically changing due to the crisis of 2008 which managed to destabilize the Western economies, speeding a process that was already started - the expansion of their presence in the foreign markets. Taking into consideration this scenario of irreversible globalization, internationalization does not represent only a possibility, but a necessity.

The concept of internationalization can be defined as the union of those processes acted in order to ensure the company the possibility of being present and participate on an international level [1]. It is important to point out that this term refers in the first place to entering into foreign markets in order to take the opportunity that the new country proposes from the sales point of view. On the other hand, the penetration into a new market with the aim of exploiting the cost advantages cannot be defined as internationalization, otherwise, it can be defined delocalization. This concept rose especially in the last few years, due to the directions taken by the small and medium-sized enterprises with the purpose to fight the crisis, which hit the economy in 2008. [2]

2. Insight into the SMEs internationalization process

One primary problem that is broadly being discussed is that SMEs seem not to be ready to face the difficulties of internationalization due to the lack of a solid structure and accessible resources. However, in the last few years, they

demonstrate good adaptability to the difficult phases of economy, answering efficiently to mutable and differentiated demand.

From this point of view, it is necessary to analyze the strengths and weaknesses of this type of enterprise in the process of internationalization (Table 1).

Table 1 – SMEs going international

Advantages of SME	Disadvantages of SME
Flexibility: ability to modify the strategy and the organization when facing changes. The small but highly movable structure allows the SME to obtain prompt answers to the market new needs	Low level of resources: SME does not have a wide range of resources to use in the acquirement of information, personnel formation and further investments
Specialized and innovative knowledge of the product: the possibility to develop particularly innovative and suitable solutions, positioning themselves in those market segments where elements as creativity, differentiation and personalization prevail	Lack of organizational and strategic competences: the organizational asset in many enterprises is characterized by basic structures in which the management is mostly under the owner's control. This leads to the centralization of all the decisions in the hand of the owner, which most of the times lacks knowledge from the strategic and management point of view
Union of family and enterprise: this factor influences the entire work of the small enterprise because everything revolves around the choices and condition of the family who owns the business. This characteristic is useful in order to realize a more rapid in the decision-making processes and in their implementation, even if in some cases it can also represent a restriction toward the development.	Limited internationalization culture: in this small entrepreneurial realities, the geographical horizon tends to match with the cultural horizon of the leadership

Since most of Italian SMEs' businesses are based on the export activities, it has come the moment to rethink and reengineer the productive processes if they want to survive in the international context and keep their primacy and relationship created with international partners. They need to build a new culture of the enterprise that puts the person at the center of the company because he is a very flexible element in a production such as the Italian one where the main word is "flexibility". According to the Italian Minister of Economic Development Carlo Calenda, Industry 4.0 is coming with not only technological but also organizational changes and of the approach towards the client. If in the past the industrial revolution enhanced the economies of scale, now the Italian panorama will cross a phase where the knowledge becomes crucial [3].

3. Industry 4.0 – Are we ready?

To illustrate the perception of new World 4.0, a research conducted by McKinsey over 300 companies of the USA, Germany and Japan will be presented.

The research points out the presence of big expectations from the companies towards the Industry 4.0: Germany is the most faithful country with 92% of the companies which retain this revolution as an opportunity, followed by the USA and Japan (Figure 1).

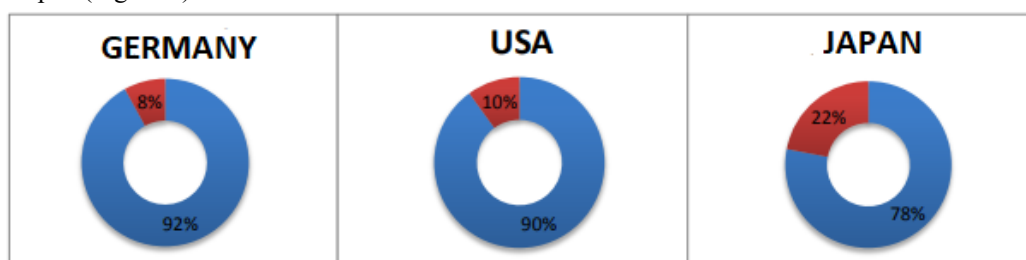


Fig.1. Companies with a positive perception of Industry 4.0

Source: [4]

This faith is reflected also in the investment acted in terms of Research and Development from the companies interviewed: the USA and Germany invest more than Japan, reaching the pick of 45% of the budget invested in Industry 4.0 by 10-19% of the enterprises, a little lower than the USA, with 32%. Japan, less faithful, sees only few companies (4%) investing only 33% of their budget.

Nowadays everybody around the world is talking about Industry 4.0, trying to analyze and understand which can be the benefits and the risks. There are many different opinions among the experts about the impact that Industry 4.0 can have on the Italian SMEs.

A study conducted by Padua University depicts the reaction of the companies to adapt to this change (Fig. 2). The research is done among 5421 manufacturing companies belonging to the North of Italy and to the sector of Made in Italy.

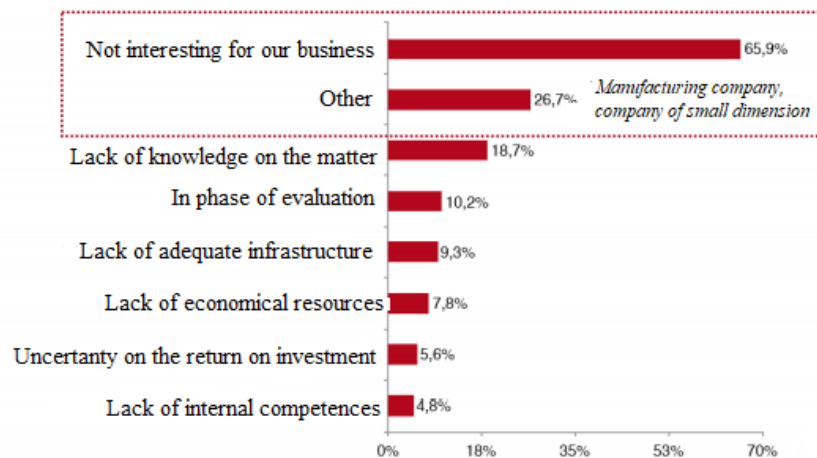


Fig.2. The readiness of SMEs for Industry 4.0

Source: [5]

As can be seen from Fig. 2, the majority of the enterprises think that the new technologies are not of interest for their business. Besides, SMEs are slowed down in the use of these technologies due to the lack of ability and knowledge in the 4.0, in addition to the difficulties in getting fundings from the banks.

Fig. 3 outlines the most common challenges for adoption of new technologies 4.0 by SMEs.

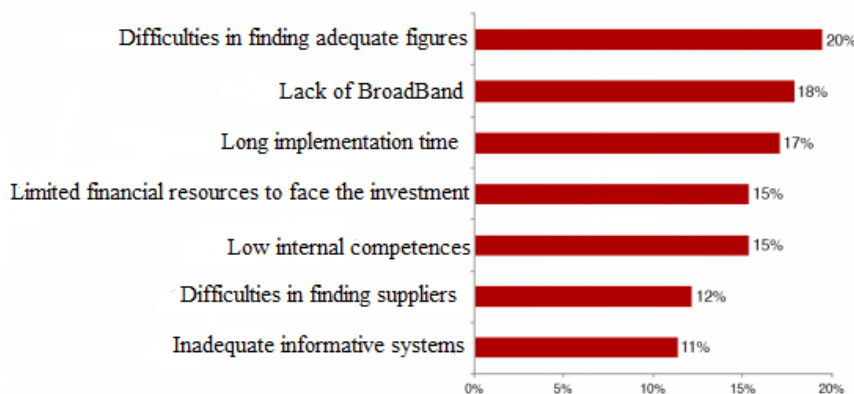


Fig. 3. Challenges for adoption of Industry 4.0 by SMEs

Source: [5]

Some previous studies indicate that Italy and its SMEs are not ready to embrace such a radical change yet and that this transformation can lead to the disruption of the entities both nationally and internationally. But on the other hand, there are those experts which put the accent on the Italian SME's point of strengths that with Industry 4.0 can improve their supply chain and strengthen their relationship with the foreign market and increase their export volume. The conducted analysis is presented in the Table 2.

Table 2 – Italian SMEs in Industry 4.0

Strengths of the Italian SMEs in internationalization process	Weaknesses of the Italian SMEs in internationalization process
Flexible specialization and the high level of know-how	Lack of player of a global-dimension system and a national vendor software (as for example in Germany where Bosh and Siemens represent the driver of the 4.0)
University system which gives access to high-quality resources	Limited development of the communication infrastructures. (Despite the Government launched a financial program of 6 billion in order to cover all the nation, less than the 40% of the Italian population has the optical fiber whereas the European average is 68%)
Strong manufacturing industrial system and high competences inside the productive supply chain	Limited managerial culture of Italian SMEs (the Italian enterprises are mostly run by families and are reluctant to any change and innovation, leading to a consistent retard on the digitalization respect to their transnational competitors and peers)
Favorable and advanced cultural approach from the entrepreneurial system toward the integration	
Enterprises full of vitality	
"Made in Italy" good reputation	

4. Industry 4.0: an opportunity for Italian SMEs

The strategy of Industry 4.0 sees the introduction of some enabling technologies, digital and interconnected, not only with the aim of increasing the productivity and the value but also for the promotion of new business models, to increase the number of highly-trained jobs, for the possibility of modernizing, strengthen and integrate our industrial system and the value chain, to increase the competitiveness of the product, to promote reshoring activities and to redesign the productive and organizational processes in order to increase the efficiency and maintain their international position in order not to be destroyed [6].

The strategy that the Italian SMEs should apply is a mix of the European and American models: both have the goal to integrate machinery, objects and people in the new cyber-physic concept that is present in the supply chain and in the entire society. The difference between the two models is: while Europe aims to optimize the manufacturing sector, the USA aims to improve also the service activities, meaning the entire economic complex [7]. So, the strategy should have the attention for the manufacturing sector and also the services: specific technologies allow to increase the ability to realize customized productions where the product can be even rent because the real value is the service and the remuneration based on its performance.

It is clear as the implementation of a place-based strategy, based on competitive advantages of the industrial system, leads, undoubtedly, to new challenges and big opportunities that the national enterprises should take in order to be the protagonists on the international scene in the next years.

If we look at the issue from a technology-pull logic, the challenge of Industry 4.0 is referring to technological solutions aimed to optimize the production processes, support the processes in the industrial automatization, enhance the collaboration among enterprises. In this way, it is clear that Industry 4.0 represents an unmissable opportunity to reposition and to make the competitive factor of the Italian SMEs more sustainable.

So, the SMEs can use this new challenge to gain many advantages such as:

- Increase productivity through less set-up time, reduce mistakes and machine downs and, at the same time, increase the quality and reduce the waste through sensors that monitor the production in real time.
- Give value to the Big Data as an independent production factor and as the roots for a new competitive value, avoiding that the digitalization is acted only as the "electrification" of some processes, but it should become an enabling factor in order to use the big availability of data to improve the processes, redesign the products according to a smart key, and renew the business processes.
- Formalize their own "informal knowledge" that represents the advantage of SMEs of the country, through its translation into data and its use through suitable analysis models.
- Use the flexibility of the Italian SMEs to promote the interconnections and the clustering of district, networks, supply chain and the passage from a supply-client logic to an industrial partnership in a competitive ecosystem, interconnected and integrated.
- Create a more thigh integration of the supply chain and compact the value chain between suppliers and sub-suppliers, able to give to the productive system a better dimensional scale. The advantage of Italian SMEs becomes less connected with the enterprise dimension but more dependent on the strategic positioning and the interconnections along the whole value chain.

- Create the condition for a more developed dialogue with the financial world: the enterprises are not referring to the financial world in an atomistic way, they are talking as real integrated systems, acquiring higher visibility on the capital markets, more negotiating power with the banks, reducing the informative asymmetries, the need for circulating capital inside the integrated ecosystems and, consequently, increasing the financial paces in order to sustain the investments needed [8].

From a market-pull logic, the manufacturing digitalization is creating a new productive paradigm in which the international and national competition is playing on many different aspects. The competition on the markets is not only about the product and the production process or the brand anymore, but it is based on the aspect as the manufacturing, the design, the customization, the authenticity and services [9].

It is also important to consider the transformations from the consumers' point of view. In fact, it is clear as the consumer is willing to recognize the value of the variety and diversity, they do not settle for a mass product. In order to meet the need of modern costumers, who express always more and more the need for sophisticated and niche products, the new manufacturing, should develop two main characteristics: variety and customization. It is about aspects perfectly combinable to those factors which have always distinguished the growth of Italian SMEs since the first years of 2000, contributing to the diffusion of the Made in Italy in the world.

SMEs in Italy have a high productive specialization, high flexibility and limited vertical extension that allow them to adapt rapidly to the market demand. They act especially in those sectors with low technology that allow the specialization in phases with high added value, where the competitive game is not based on prices, but mostly on the quality and on the services aimed at the satisfaction of the client. The success of many of these enterprises is based on the wide range of products offered, with a high design content, really appreciated on an international level as shown from the Global Competitiveness Index (GCI), elaborated by the Edison Foundation, which shows as on 5.117 products, Italy figures for 932 cases, on the first three places between the exporting countries [10].

Another effect of Industry 4.0 is the "reshoring", meaning the return of the production lines inside the national borders. In fact, the reduction of costs and logistic times, the effect "Made in", the attention to customer service are the main factors that motivated the re-localization. According to [11], 121 companies returned their production back to Italy and they belong mostly to the sector of fashion (41%), electronics (25%), mechanics (16%). It appears necessary to take this opportunity and start a strategy of return of the productions that in the last few years were decentered in countries with lower labor costs, enhancing this phenomenon and creating new opportunities of investments and growth from the presence of competitive and high-quality manufacturing.

We should point out that it is necessary to invest not only on the technological dimension but also on the educational one and on the offer for competences that the territory cannot offer also in the light of the flexible model of work organization that offers the regional productive structure, represented by the SMEs [12].

Thus, investment in advanced technologies needs new competencies. It requires the presence in the labor market of new skills, both relational and technological advances. Technological abilities and knowledge in this context appear as a fundamental requirement not only for the employee but also for the company itself that intends to keep a dominant position on the market.

Industry 4.0 is going to lead to the change in the roles covered by people. SMEs 4.0 are going to look for people able to work together in a social-technical system, where there is the passage from a manual production to the supervision of the automatized process in real time. So, with the introduction of IoT, for example, the supply chain would not need the action of the person for the mechanical operations, but only setting activities of the machinery and problem-solving. This is going to have strong implications not only on the occupational impact through the possible creation of new jobs, but also on the professional specialization and on the digital formation of the employees and on their skills. In fact, the smart factory is going to influence strongly the blue-collars that in this way are becoming communicative, cooperative and polyvalent: it will emerge a new dimension inside the smart factory, of an "augmented" worker, digitalized, with a high level of secondary instruction, where knowing the English language is fundamental. Besides, the white-collar would guarantee the integration between production and function that gives the intelligence to the machinery: setting and engineering.

As underlined in the report, the growth of the value of the additional products that can arise from a technological upgrade can be measured with an amount of 8.6 billion euro per year. The planned growth will not only generate positive effects on the production activities but also it will have expansionary effects on the occupation sphere with and improvement of around 39 thousand units per year. In the document, it is also stated that the technological upgrade through 3D and robotics can generate a value of 4.3 billion euros per year. A strengthening operation of the technological equipment would also allow the Made in Italy manufacturing network to create more value and generate more resources to sustain the investments and the competition [13].

5. Industry 4.0: Rising Problems for Italian SMEs

The foremost problem that the Italian SMEs meet is the risk of being wiped away by the national and international competitors which understood the importance of the new technologies. Besides, along with these new technologies,

a new generation of problems appears such as the inability to rebuild the system, the cyberattacks, and the occupation.

As for the first one, the risk of failing is in the inability of the national industrial structure to build the system enhancing a real and concrete cultural jump. The innovation is about all the productive sectors, mature or not, indifferently from the geographical localization. It is about the contamination and convergence among the different world that nowadays have to create a system toward the 4.0 limiting their individualistic feature characterizing the majority of the Italian manufacturing SMEs. The risk is high, the lack of an innovation-driver big player mines the goal of creating a common vision based on a synergic work among the actors, from the industrial world to the financial and institutional one.

Another problem is about the management of risks, which cannot be managed in relation to a single industrial plant, or to a single commercial activity. In fact, with the 4.0 the industrial production becomes automatized and interconnected, while the value chain becomes always more and more integrated. In this context, the enterprises, the subsidiaries and national productive districts are more exposed to cyberattacks. It is possible to have access to sensitive information or to the know-how representing the competitive advantage of the company, with disruptive effects that can involve and damage the entire value-chain.

The problem is very actual in today's Italian SMEs because they have a very low level of cybersecurity: only a company out of six has a pluriennial plan for their defense from the cyber attacks. The Italian SMEs are still undervaluing the risks connected with the cyber crimes in respect to other countries. The percentage of Italian companies that is afraid of future data robbery of the clients is almost the half of the percentage of Irish companies (21% vs 41%), while the fear to be a victim of identity theft is more undervalued by the Italian companies in respect to the Swiss ones (8% vs 19%) [14].

Another rising problem that worries the whole society is that the change in the digitalization can be disruptive for the jobs. It is clear as the adoption of automatized technologies in the productive processes will lead inevitably to the substitution of the human capital with artificial intelligence [15]. The consequence is the extinction of numerous professional profiles and, consequently, a disruptive effect on the occupation with a particular reference to the labor operating in the primary and secondary sectors.

Furthermore, the "FabbricaDigitale" has analyzed as the jobs lost during the crisis would not be recovered because it would be about a position that has already been substituted by new technologies, configuring these workers as the first victim of the crisis of the Industry 4.0 [16].

For this reason, the only solution is to be prepared to face a future where a few will generate resources for the many, where the richness will be generated in a completely different way and the quantity of the capital needed for each unit of product will be significantly lower.

extent of high resource utilization, amassing, essentialness and computational capacity [4].

6. Solutions

The help of the Government

Italy is a manufacturing country and it is one of its essential point of strength that has always enabled it to survive in an international context during the past. In this context of innovation of the Italian manufacturing, Industry 4.0 is connected with an important part of the research and innovation issues indicated as priorities for the future of the national manufacturing and address a significant number of priority lines of action.

The Government knows this, and for this reason, in order to limit the damage and help the smallest realities to keep their national and international positions, it has worked for a significant relaunch of the industry. While the main industrialized countries were already active or the support of the national industrial sectors, in order to take the opportunities, rose from 4.0, the answer from Italy came later.

The National Industry 4.0 Plan was presented for the years 2017-2020 [17]. This Plan is a collection of measures to favorite the investments in the innovation and the competitive ability of the enterprises and to empower those measures acted years ago that have revealed themselves as efficient. The Plan sees concrete measures based on three principal guidelines:

1. operate in a logic of technological neutrality;
2. intervene with horizontal actions and not vertical or sectorial;
3. act on enabling factors.

The Plan is divided into four strategies.

1. Innovative investments

The goal of this strategy is to stimulate the private investment in the adoption of enabling technologies of Industry 4.0 and increase the expenses in research, development and innovation.

Considering various tools, the most important ones are as follows:

Super depreciation: it sees a depreciation of the 140% on the purchase of machinery from the enterprises.

Iper depreciation: depreciation only for the investments in Industry 4.0, in the digitalization, with incentives of 250%.

The measure called “Nuova Sabatini”: it includes facilitated funding for the acquirement of new machinery, plants, tools from SMEs with the aim of the realization of investments in digital technologies.

2. Enabling infrastructures

Its mission is to ensure the adequate infrastructure of the network, the safety and protection of data, cooperate in order to define standards of international interoperability.

3. Competences and research

The Government is trying to create competences and stimulate the research through educational paths created ad hoc. In fact, it promoted the creation of competence center intended as a hub of the innovation that has to develop around four or five universities. The goal is to promote and realize the applied research project of technological transfer and formation on advanced technologies of Industry 4.0 [18].

4. Awareness and governance

This strategy aims to spread the knowledge and to raise awareness about the potential and the application of the technologies 4.0 guaranteeing the help by the Government to reach the goals fixed.

The plan aims to obtain in the first year an increase of private investments of 10 billion euros, 11.3 for the private research, development and innovation with the focus on the technologies of the new industrial paradigm and 2.6 billion euros for the private early-stage investments [12].

Investment in HR Department

The digital transformation of the Italian SMEs has to be done through technologies, which are the key elements of the path of Industry 4.0, but it is also necessary to adapt the technological innovation to the corporate reality: it means introducing new organizational procedures with the aim of optimizing the processes and the existing models. In order to do that inside an SME, an important role is played by the HR department, which has to facilitate the transformation through culture, people and system mediating between the past and future. Its function has, consequently, to operate for the research of increasing quality of the goods and services supplied and the productive efficiency.

Furthermore, it has to spread inside the company an active cultural approach toward the overcoming of the habits that sees the openness to innovations. This has to involve all the corporate areas: production, sales, marketing, administration, etc. [19]

The Innovation Manager

The Innovation Manager is a new figure rose during the last couple of years and created by the MISE, the Ministry of the Economic Development. They represent a consultant that aims to cover different corporate areas: from the innovative technology of the processes to the financial organization, always with the eye of the development toward the creation of an SME 4.0 [20]. In order to do that, the Government has given 25 billion euros per year (2018-2021) to finance the Vouchers for the Innovation Manager [19].

7. Conclusion

The society is currently living a historical period which is different from the others for the number of changes that are occurring in a very short period of time. The industrial revolutions have led to numerous changes that can be painful, most of the time, but that are necessary as never before. Industry 4.0 is generating new opportunities all over the world and who is not going to take them is the first one that is going to be outclassed. Entrepreneurs have to be ready to face new challenges if they want to survive and keep their position on the market.

The Italian institutions have to do their best to support the companies all over the territory and should take care of the break that seems to appear between them and the entrepreneurs' world. According to the data, only 8% on a national scale uses technologies 4.0 [19] and the early-adopters who have been the pioneers are having a big success, many have followed their example. Summing up the results, it can be concluded that the only way to promote the prosecution of the national process of industrialization is to find real support in the Government and keep on investing in this sector in order to maintain the primacy in all the sectors of the Made in Italy.

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