# "ITALIAN EXPERIENCE ABOUT SCIENCE TECHNOLOGY PARKS"

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## ABSTRACT

*In this work there are discussed importance, possibilities and advantages of applying Science and Technology Parks (STP) as a support to development of Small and Medium-sized Business.*
*Italy is home to numerous cooperative initiatives between universities, firms, research institutions and other sector operators. Some are especially noteworthy for their capacity to bring a variety of skills together, the innovativeness of their approach and the development opportunities they offer the local area. In Italy there is a growing number of Science and Technology Parks which perform many activities, such as R&D, incubation, technology brokerage and innovation support. The first Science Park was established in 1982; a national program in the 1990's extended presence of these intermediaries across the whole country, giving particular momentum to their diffusion in the economically depressed areas. Twenty-nine Science and Technology Parks are now part of the Association of Italian Science and Technology Parks (APSTI), which was founded in 1989.*
*An overview of Science and Technology Parks and other Innovation Centres in Italy is presented, including the goals set before them, the reasons for their foundation, as well as their structure. Basic information about knowledge based incubator is also given, with special emphasis given to Incubator I3P. The Italian Incubator I3P Scpa-Incubator of Turin Technical University has won the annual international award for "Best Science Based Incubator 2004. During 2003., author of this article was hosted there as participant of international project "Integra".*

**Key words:** Science-Technology Park (STP), Incubator, Small and Medium-sized Enterprise (SME),

## 1.INTRODUCTION

Science and Technology Parks (STP) are one of the best-known and worldwide diffused "intermediary structures" in the field of knowledge, innovation and technology transfer to SME's. In this context, other examples of intermediaries that can be found in Italy are service centers, innovation centers, agencies for regional development, government research and innovation organizations, service points linking end-users to other service providers (such as Chamber of Commerce), business association, etc [2].
In line with the importance of SME's in the Italian industrial system, a recent survey done by the Italian Institute for the Industrial Promotion (IPI) in the framework of the RIDITT project, showed the presence of about 800 intermediaries that supports SME in their creation, development and innovation processes, and among these about 40 are directly referable as science and technology parks, most of them grouped in the Italian Association of Science and Technology Parks (APSTI).
Differently to other countries, several models of STP can be found in Italy and this variability is mainly linked to a lack of a coordinated legislation programs, at national and regional level during the creation phase, as well as the social objective of the initiative (i.e.: job creation, re-qualification of dismissed areas, delocalization, development of lagging regions, etc.).

In general, a start-up of a STP in Italy has been leaded by four classes of main actors: the local or regional government, a group of enterprises, a university /research centre or a composition of these. However, STP's in Italy are characterized by a three common words: innovations, competitiveness and territory, i.e. enhance the competitiveness of a territory using the leverage of innovation.

## 2. BASIC ECONOMIC INDICATORS OF ITALIAN ECONOMY

Italy is home to numerous cooperative initiatives between universities, firms, research institutions and other sector operators.
Industrial districts in the Italian economy are described by the following indicators [3]:

- 200 industrial districts;
- 25% of Italian population;
- 32% of workforce;
- 45% of manufacturing job in Italy;
- 43% of manufacturing exports;
- top positions in annual ranking of ¨Quality of life¨ in Italy.

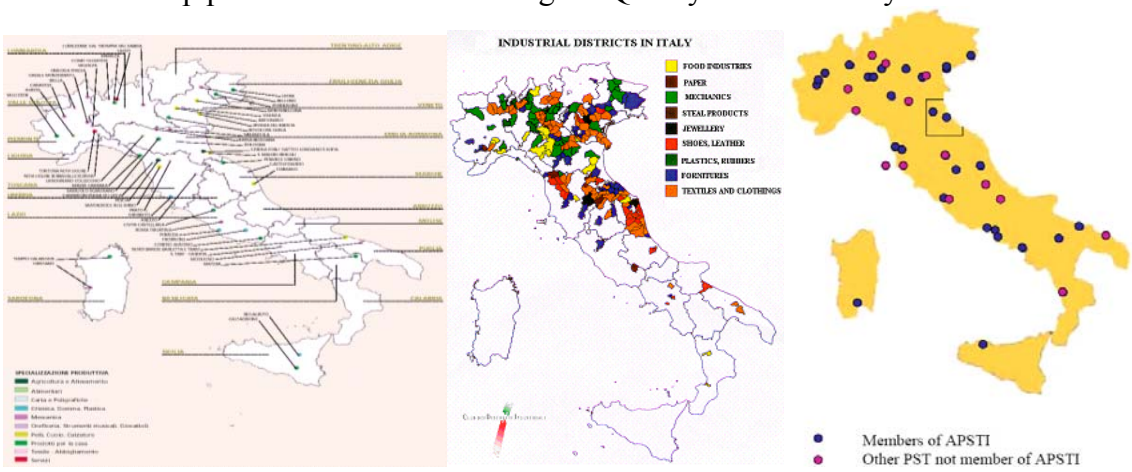


*Figure 1. Industrial districts in Italy and members of apsti (source: simest, 2004) [4].*

*Table 1. Italy in world markets (source: SIMEST, 2004) [4].*

| At the forefront among exporting countries | Increasing rank among inesting countries (FDI) | Share of SME's in the Itralian Economy |
|---|---|---|
| 4% of world exports | 3,5% of FDI stock in the world | 90% of all Italian businesses |
| 4th place in Europe | 7th place in Europe | 70% of Italian export |
| 8th place in world | 11th place in world | 45% of foreign industrial shareholdings by Italian enterprises |

*Table 2. Italian companies in manufacturing sectors by the number of employees (Source:SIMEST, 2004) [4].*

| | No. of firms | % of firms | No. of workers | % of workers |
|---|---|---|---|---|
| Micro (1-9) | 456.832 | 82,9 | 1.183.301 | 24,2 |
| Small (10-50) | 82.984 | 15,1 | 1.510.909 | 30,9 |
| Medium (50-250) | 10.014 | 1,8 | 953.486 | 19,5 |
| Big (>250) | 1.444 | 0,3 | 1.241.997 | 25,4 |
| Total | 551.274 | 100,0 | 4.889.693 | 100,0 |

*Table 3. Employment in manufacturing sector (companies with 1-49 employees) divided by countries (Source:SIMEST, 2004) [4].*

| | Italy | Germany | France | U.K |
|---|---|---|---|---|
| share | 52,5% | 21,7% | 25,8% | 22,8% |

*Table 4. Italy's share of g7 export (Source:SIMEST, 2004) [4].*

| Total | Footwear | Leather | Tiles | Gold Jewellery | Men's Clothing | Furniture | Women's Clothing | Lighting fixtures |
|---|---|---|---|---|---|---|---|---|
| 9% | 66% | 55% | 54% | 54% | 38% | 37% | 34% | 32% |

*Table 5. Rank of "made in italy" in world markets (Source:SIMEST, 2004) [4].*

| | Export ranking (in US$) | Trade balance ranking (export-import) |
|---|---|---|
| Leather goods | 1° | 1° |
| Wool fabrics | 1° | 1° |
| Men's outwear | 3° | 3° |
| Ladies' outwear | 3° | 3° |
| Knitwear | 2° | 1° |
| Ties | 1° | 1° |
| Shoes | 1° | 1° |
| Eyewear frame | 1° | 1° |
| Jewellery | 1° | 1° |

## 3. OVERVIEW OF TRANSFER TECHNOLOGY SYSTEM IN ITALY

In the framework of the activities of innovation promotion and technology transfer for SME's, the public bodies are supported by many actors. Some of them act at National level and play an important role in the linking between institutions and productive system, operating directly (Confindustria, Unioncamere, Institute for Industrial Promotion, etc.) or via specialized companies (Specialized Agencies of the Chamber of Commerce, Agitec-Agency of Innovation Technology, etc.). Other bodies work and provide services at local level.
At this point in time there is no official National register which collects all the service structures specialized in technology transfer. According to an SIMEST survey, there are around 300 active structures in this area. According to definition from IASP (International Association of Science Parks), Science and Technology Park is:
„*A Science Park is an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge based institutions.*
*To enable these goals to be meet, a Science Park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities*".

*Table 6. The main public bodies in italy involved in transfer technology system.*

| Working level of body | The main public bodies |
|---|---|
| At central level | a) The Ministry of Productive Activities (MAP);<br>b) The Ministry of Instruction, of University and Research (MIUR);<br>c) The Ministry of Technological Innovation (MIT). |
| At local level | The twenty Italian Regions, which already provide or are beginning to provide tools for innovation and technology transfer support. |

Italian intermediaries involved in Innovation and Technology Transfer has been divided in the four ways which you can see from table 7.

*Table 7. Italian intermediaries involved in technology transfer system [2].*

| Intermediaries involved in Technology Transfer | Definition |
|---|---|
| Science and Technology Parks (STP) | Structures supporting local development through cooperation between the research and business contexts (science and technology parks, technology poles, etc.) |
| Structures for Start-up Business Support | Structures supporting the creation of innovative enterprises or their modernisation (incubators, members of BIS and CIS networks, etc.) |
| Sectoral Service Centres | Structures providing innovation and technology transfer services related to a specific productive sector (textile, agro-food, etc.) or to a specific technology (laser, microelectronics, etc.) |
| Non-specialised Service Centres | Structures providing innovation and technology transfer services without a specific sectoral or technological focus. |

In Italy there is a growing number of Science and Technology Parks which perform many activities, such as R&D, incubation, technology brokerage and innovation support. The first Science Park was established in 1982. and a national program in the 1990's extended presence of these intermediaries across the whole country, giving particular momentum to their diffusion in the economically depressed areas. Twenty-nine Science and Technology Parks are now part of the Association of Italian Science and Technology Parks (APSTI), which was founded in 1989.
The figure 2 shows the typical internal services provided by APSTI and the existing relationship flows between the network and the single participants.

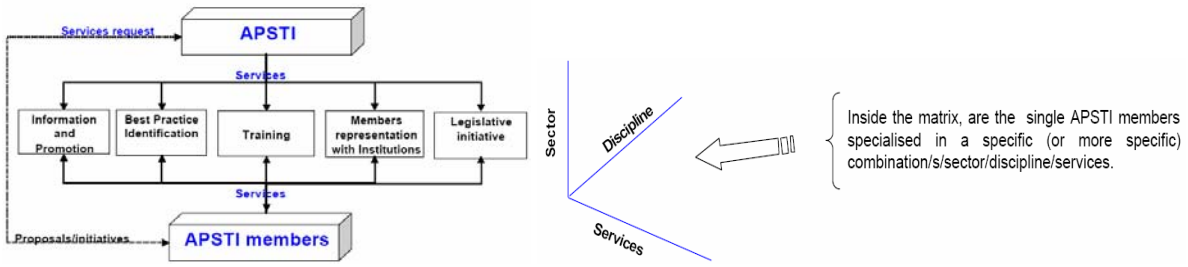


*Figure 2. Internal services provided by APSTI and external activities of STP members involved in APSTI.*

*Table 8. The list of the supply set for every macro-variable, used directly by single APSTI members.*

| Services | Disciplines | Sectors |
|---|---|---|
| Enterprise incubation | Biology | Agro-food |
| Project management | Chemistry | Environment |
| R&D | Economy and Finance | Industrial Automation |
| Venture Capital | Electronics | Biomedical |
| Technology Transfer | Industrial and business data-processing | Chemitry |
| Information search | Structural Engineering | Energy |
| Training | Management | Pharmacy |
| Business connection | Marketing | ICT |
| Consultancies | Mechanics | Metal mechanics |
| E-commerce | Medicine | Public Administration |
| Human resources search | Design | Wood furniture |
| Telematic Networks | E-business | Leather, footwear |
| Certification | Microelectronics | Textile |
| Meting organisation | Environmental engineering | Tourism |

## 4. SOME EXAMPLES OF ITALIAN SCIENCE AND TECHNOLOGY CENTERS

The National Interuniversity Tellecommunications Consortium (CNIT) is a non-profit consortium of 27 Italian universities in the telecommunication fields. It is open to other universities and institutions. The CNIT has about 450 members divided among university instructors and researchers, as well as 23 employees, 20 of whom are researchers.
The National Interuniversity Information Technology Consortium (CINI) as non-profit interuniversity consortium, established on 6 December 1989, currently embraces the following universities: Rome "La Sapienza", Genoa, Bologna, Pavia, Palermo, Bari, Turin, Naples "Federico II", Pisa, Lecce, Milan, together with the Milan and Turin Polytechnic Institutes. CINI has 504 university researchers from the departments of engineering and science. Its budget for 2004 was more than 5 million EUR.
The consortium's structures consist of the research units of the member universities, the seven thematic sections into which the consortium researchers grouped, and the research laboratories.
"Politecnico Innovazione" aims to facilitate the transfer of the technical and scientific skills and innovative advances developed in the research units and laboratories of the Milan Polytechnical Institute to industry, especially innovative small and medium-sized enterprises. The technology transfer division offers firms following services:

- information on the technical/scientific initiatives,
- activities and skills developed by the Milan Polytechnical Institute,
- identification of appropriate experts and laboratories within the Institute that can meet firms' needs;
- development of joint university/industry projects financed by national or EU research funds;
- organizational, financial and marketing consultancy services;
- demonstration and experimentation of innovative technologies;
- collaboration in launching "advanced internships" (in cooperation with the Internship Service).

The purpose of the Business accelerator at Bovisa is to develop innovative entrepreneurship, especially through business incubators. It provides start-up assistance to firms operating in high-tech sectors and includes:

- the New Enterprise Office, which provides support services for high-tech start-ups;
- the Technology Transfer Office, which facilitates technology transfer from the university's research centers to firms, and includes the E-Commerce Demonstration Centre; and
- the Incubator, where fitted premises are available for a number of small business start-ups high-tech activities.

The Turin Polytechnical Institute developed numerous initiatives for the promotion of innovation in ICT. These include: The Advanced Institute for Information and Telecommunications Technologies and Incubator.
One of the few scientifically-oriented universities to be created in recent years is the University of Sannio, founded in 1991with the objective of creating an engineering program specializing in information science. It was subsequently extended to include economics and geology departments.
A public body called Consortium for the Trieste Science and Technology Research Park, worldwide known as AREA Science Park is one of the leading multisector science parks in Europe. Established in 1982 to link the worlds of research and business, it hosts over 60

firms, centers and institutes engaged in research and development, technology transfer and advanced services for private firms and public bodies. There are over 1900 staff, two third of whom are university graduates and three quarters of whom are engaged in research. The sectors of activity include biotechnology, biomedical engineering, physics and new materials, electronics and telecommunications, information technology and the environment.
The Economic and Social Engineering Centre (CIES) is a consortium promoted by the University of Calabria. It involves local institutions as well as leading national and international firms such as: Telecom Italia, Telespazio, Sistemi Informativi (IBM), Ericsson Telecomunicazioni, Alitalia.
The experience of Catania is a positive example of the way active cooperation between centers of excellence-universities, research laboratories, high-tech firms-and entrepreneurial initiative can transform a "marginal" area into a high-tech district. Close collaboration between ST Microelectronics, one of the largest multinationals in the semiconductor industry, and the local industry, and the local university gave rise to a virtuous circle of exchanges of technological skills and knowledge, generating real benefits for local enterprises.

## 5. GENERAL DESCRIPTION OF THE INNOVATIVE ENTERPRISE INCUBATOR TURIN -I3P

The Innovative Enterprise Incubator of the Polytechnic of Turin offers centralized services, consulting support for enterprise creation and management, a stimulating cultural environment and visibility towards the external worlds and market. The incubator has a private component, but it is mainly public. Main bodies involved are Polytechnic of Turin, Province of Turin, Chamber of Commerce of Industry and Handicraft and Finpiemonte S.p.a. I3P is a non-profit company with shared capital.
I3P consists of equipped premises able to host new enterprises during their initial take-off, for maximum of three years. I3P provides essential, centralized services, management consultancy, visibility in the external world and on the market, and a culturally stimulating environment, all at a convenient price.
Access to I3P is reserved for new-established companies of persons or capital which have existed for less than a year. To enter the Incubator, the enterprises must demonstrate that they are able to develop knowledge-based projects, on a correct entrepreneurial basis and which are deemed interesting for the market. I3'P activities can be placed within a global strategy for the Piedmont territory aimed at sustaining new entrepreneurship, and which includes the Mip project (Starting an own-business) of the Province of Torino, the "Create a Business" service of the Chamber of Commerce and the activities of the incubators of the Science and Technology Parks and the Incubator of the Incubator of the University of Torino. In the context, the activities of university incubators like I3P are still a poorly-explored avenue in Italy for the stimulation of new-entrepreneurship, however they have already been consolidated in the principal European and American universities, where they have behind them more than a decade of experimentation.
The objective of I3P is to encourage and give support in the creation of new enterprises to students, young graduates and the staff of the Polytechnic, the University and the various research centers in Piedmont, by offering assistance in their start-up years. The motivating hypothesis at the basis of I3P is the will to generate new knowledge-based entrepreneurship which can draw benefit from the close relationship held with the Polytechnic of Torino and the ability of the Incubator to catalyze, stimulate and assist cutting edge project initiatives. This close relationship between the Polytechnic and I3P has brought mutual advantages. The enterprises have been able to take advantage of the proximity, physical and not, of the Polytechnic in order to access knowledge developed in its research laboratories. The Polytechnic has found within I3P a

laboratory, also in a didactic sense, for cultural diffusion and for the concrete opportunity for the creation of enterprises, of advantage to students and researchers by assisting the transfer of technological innovation from the laboratory directly to the productive sphere.

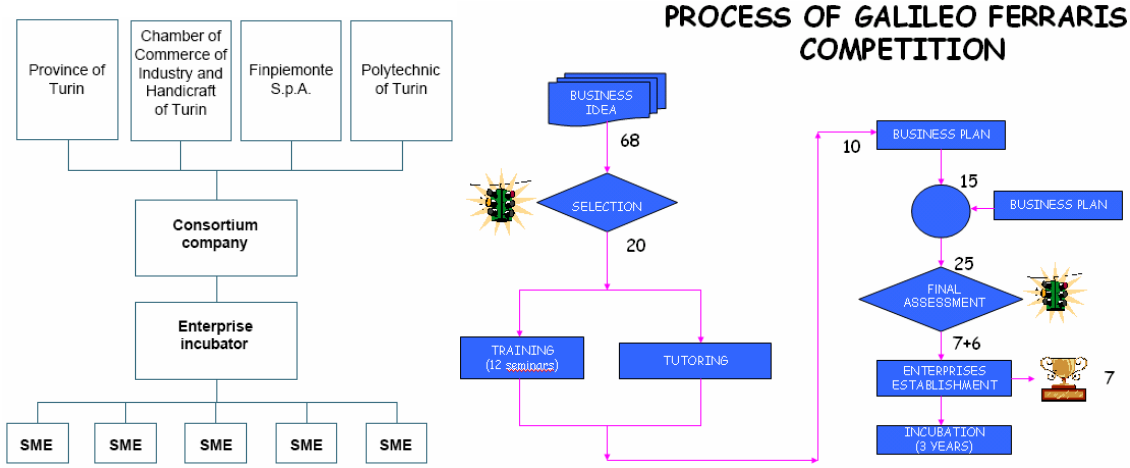


*Figure 3. Structure of the I3P incubator and process of competition at I3P.*

The enterprise incubator is in equipped space with advanced researches structures. It hosts, at reduced costs, start up enterprises during the first 3-5 years of their life cycle. The structure offers centralized and essential services, consulting management support, and visibility to the external market. A pre-incubation period is provided in which training seminars related to preparation of a business plan and support of experts are supplied. Basic services (consulting of first level including the access to public and private financings, library access, secretary, telephone, fax, internet access) and specific services (specialized consulting, administrative and financial supports, etc.). It is facilitated access to the laboratories of the Polytechnic and to the provider of funds.
Services offered include enterprise tutorials on marketing & sales, management and human resources.

SME's can join the initiatives of the incubator in the following ways:

- The start-ups must prepare, with the support of incubator, a convincing feasibility plan covering technical-innovative, financial and market aspects.
- Enterprises with less than a year of life can immediately apply to join the incubator.

Start ups and already existing enterprises can participate to:

- Workshops;
- Meetings on the Italian university incubators. The aim is to exchange points of view, information about of the activities and the policies developed by each institute regarding entrepreneurial promotion, to identify synergies and possible common actions in the future.

Customer profile of I3P is as follows:

- Employee, students and graduated at the polytechnic, external entrepreneur, enterprises with less than a year of life.
- The average number of enterprises incubated is 35.
- At the moment the incubator hosts 21 enterprises.

The Italian Incubator I3P Scpa has won the annual international award for "Best Science Based Incubator 2004.

## 5. CONCLUSION

Technology Park and Science Park are terms that apeared in Italy in the early 1980s. In those days the aim was to look new for new ways to overcome economic stagnation by learning from USA models and experience for industrial development such as agglomeration of technology based, SMEs close to University environment. The concept was to favour technology transfer from the public research community to the private sector as well as enhance entrepreneurship culture amongst the scientific sector.
According to the International Association of Science Park (IASP), a Technology Park is an organization managed by specialized professionals, whose main goal is to increase the wealth of its community, promoting the culture of innovation and the competitiveness of its associated business and knowledge-based institutions.

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