

# Technological Parks Play Licensing Role

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Technological parks can be important in technology transfer, especially to small and medium businesses.

In the last several years the EEC Commission has initiated actions to encourage the transfer of technology in Europe, to promote the establishment of high-tech industries and to strengthen the cooperation among European companies.

These actions could be viewed as some kind of "Industrial Policy" sponsored by the EEC bodies oriented to benefits from the externalities due to the incentive efforts in the universities, research and development centers, and the innovative industries. Professor Richard E. Caves of Harvard University has pointed out that the opportunity for public policy comes when the research spending of domestic (or European) firms have externalities for other domestic (or European) firms, but lesser externalities for firms located abroad.

The appearance of several industrial, science and technological Parks in Europe is a significant issue to enhance the diffusion of the new technologies and to set up new companies or to upgrade the whole industrial base. The European initiatives have been based on the American and Japanese experiences, which were oriented to introduce high technology generated in the most innovative companies and the universities into industry.

This strategy is related to actions seeking the recovery of some particular regions affected by the industrial crisis. The purpose of the Business Innovation Centre (BIC), promoted by the EEC Directorate-General for Regional Policy, is "to mobilize the human, technical and intellectual potential of the region

within entrepreneurial networks."<sup>1</sup>

The arguments to explain the policies involving a public support for the diffusion of the new technologies or the regeneration of the declining areas are concentrated in two outstanding considerations.

1. **Market failure.** High risks concerning the development of advanced industries make it difficult to undertake large long-term investment in R&D activities that companies need to compete in the international markets. Despite the patent system and other institutions to protect investments, many small and medium companies find problems in avoiding the free replication of their R&D results by their competitors. The shrinkage of the product-life cycle, characteristic of capital-growth sectors, prevents the internalization in every private firm of its costs and benefits of the innovation process.

2. **Productivity Growth.** The new technologies, namely the information technologies, can transmit to the other sectors the goods and systems to improve the global rate of productivity. The way to improve industrial skills and to obtain more efficient companies is the dissemination of the new technologies and their reinsertion into the traditional industries.

## • Optimum Approach •

The optimum approach between private and public initiatives must take into account the different models arising in the industrialized countries. The experience of some American Science Parks shows that it is possible to have a synergy between the universities and the factories without a significant intervention from the public authorities. The European policies reveal the active role of the national

and regional organizations, whereas in the Japanese projects are based particularly on the joint efforts of local governments and big corporations.

Many medium companies have identical knowledge as the most strategic commodity to compete and are willing to cooperate with universities, research centers, big companies, etc. to get needed knowledge.

Indeed public intervention to facilitate the communication among economic agents could be an acceptable second-best solution allowing expansion of the learning activities. An example may be the SPINOFF program — Strategic Program for Innovation and Technology Transfer launched by the EEC Commission.

## FACTORS TO SET UP THE TECHNOPOLES

The "Technopole" is viewed as a particular space where different entities developing the different phases of the whole innovation process are located:

1. Basic Research
2. Industrial Research
3. Product and Process Development

more:

4. Early Prototype or Pilot Plant
5. Interim Manufacturing
6. Full Manufacturing
7. Commercialization

Furthermore, it provides the services to carry out the innovative activities.

1. Education and Training
2. Information
3. Patenting and Licensing
4. Entrepreneurial Services
5. Commercial Promotion
6. Financing and Venture Capital

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The locational criteria acquired from the existing experiences can be summarized as follows:

1. The scientific and technical infrastructure, mainly universities and research centers.
2. The existing industrial or economic base and the presence of some high-tech companies or conventional companies demanding high-tech products and systems.
3. Quality of life, related with the transport and communication network, cultural level, education and health capabilities and environment integration.
4. Labor skills and costs and productivity level.
5. Financial structure ready to enter into venture-capital agreements and to finance startup companies.
6. Access to regional, national and international markets.

The accumulation of these components induces the mechanisms known as cross-fertilization, ensuring the active interaction of the factory and the mobility of the material, information and human resources.

High-tech industries do not need large-scale plants or big investments and the products have a high price per unit. In consequence, they have a great potential to diffuse the knowledge embodied in their products and systems.

The technological park could be a framework to develop small areas or to create unemployment in the regions with heavy and bulky manufacturing industries shifting to more qualified industries hiring more qualified people.

The Economist magazine published a very interesting report titled "A Tale of Two Rivers." It describes initiatives to transform the economic structure along the Ohio and the Rhine Rivers. The article contained examples of cross fertilization between knowledge-suppliers and knowledge users plus a successful partnership between business and local government.

## THE SPANISH CASE

During the past few years its projects to set up technological parks have arisen in Spain following pat-

terns from the United States, Europe, and Japan. After some attempts, very close to the job creation initiatives located in the industrialized and developed northern regions, public and private policies have been oriented to catch up with the new technologies aiming to reach the modernization of the industrial and service network.

At present, the Spanish parks projects are:

- Andalusia (Malaga)
- País Vasco (Euzkadi)
- Asturias (Llanes)
- País Valenciano (Valencia)
- Catalunya (El Yaller)
- Madrid (Cerro Gaitano)

These parks are conceived as a space to gather R&D facilities, Higher Education Centres and Industrial Parks to get the settlement of the technical-based companies. The long-term target will be the diffusion of the technology throughout the region, by means of successive steps involving many transfers of technology and licensing activities.

I would like to draw attention to the Andalusia Park case because of my own involvement in the first phase and to emphasize the possible profile of that park. Up to now, AP is the only project situated in a less developed region, whose economy was traditionally supported by agriculture and tourism.

Nevertheless, other considerations can shed light on the convenience to choose the Malaga location.

1. Despite the economic lag, Malaga concentrates leading high-tech industries or information technology such as: Fujitsu, Alcatel, Siemens, Isotelco, etc. that may be used as a first core group to prepare a park specialized in electronics, communications and information technology.

2. The Park is established next to "Costa del Sol," a good land open to the international world, with a high proportion of English speaking people, advanced infrastructure, transportation, international airport, leisure and cultural facilities and, finally, significant academic strengths.

A selected group of foreign researchers from the most developed

countries was studied and evaluated "in place" to define the elements and the layout of the future park.

In Europe, the AP promoters visited and considered the French Sophia Antipolis Park next to Nice, with almost 20 years of continuous activity; the Italian Technopoli (United founded by Agnelli Foundation at the urban environment of Torino, and Marine Center Park (Genova) developed by DITEL; Centre Ligero per la diffusion della tecnologia (Liguria) Center to diffuse technology) over the Corona Institute; the French project of Haute Science Park (Birmingham sponsored by the City of Birmingham in association with the University of Aston and Lloyd Bank.

Other Italian projects, such as Bari, Technopoli, Technologia Pistoia di Milano, Torino International Foundation were analyzed by means of secondary information.

The Japanese Technopoli has been a relevant pattern to manage the AP implementation. The explanation lies in the far-reaching Japanese plan to create more than 20 Technological Parks, many of them sited into backward regions. The experience was critical for the Spanish challenge, because it was also seeking some successful models set up in rural regions belonging to a industrialized nation.

## ► Complete Analysis ►

A complete analysis of five outstanding Technological Parks selected in function of their ability for the Andalusian Park was carried out:

- Kamamoto Technopoli (Kiyokuchi)
- Nagasaki Technopoli (Shimizu River TechnoValley)
- Kobe Plains Technopoli (Kobe Life Science Community)
- Kawasaki Kanazawa Technopoli (Saito Airport Area)
- New Academic Town of Saitama (linked to Tsukuba National Exhibition)

The Japanese view of a technopole is a high-technology integrated city, constructed with "cluster cities" using the latest technologies but keeping the tradition and culture

that enhances the quality of life of that area.

Two different issues were taken into account from the United States.

The Silicon Valley perspective, only possible in an over-researched region surrounding the most creative academic centers in the world, SV is an almost spontaneous technology able to spawn a cluster of fast-growing companies by means of the transfer of science and technology accumulated during 30 years in the universities and national laboratories.

The trouble regions activities, through the approval of the Business Technology Centres (BTC) was developed in Columbus (Ohio) by the Thomas A. Edison Partnership Program in alliance with The Ohio State University. BTC is targeted toward the provision of technical information and seed capital to the BTC tenants of clients, to generate new companies and activities. Like the Business Innovation Centres (BIC) in Europe, BTC is established to encourage the potential start-up and to promote high-tech based partnerships.

#### MAIN COMPONENTS OF THE PARK

The Preliminary Study to set up the A.P. according to the evaluation of the European, Japanese and American projects, outlined the park as a Technology Transfer Plaza (TTP), combining the capacities of public and private entities to make up an innovative space, able to release the technical innovation out of their physical limits, contributing to modernize the whole Andalusian economy.

TTP reviews and disseminates the scientific and technical flows from:

1. Universities and Research Centres, existing in the vicinity or to build up in the next future. Because the park is concentrated in the field of information technology the new research facilities are related to:

- Advanced Software Systems.
- Laser Industrial Applications.
- Robotics and Automations.
- Advanced Communications and

Millimetric Waves.

2. Big Companies like core groups and New Ventures generating or embodying the innovative technologies, now more supplied by foreign entities through licensing joint-venture or equity-investment agreements. The relationship with the IBC holder is a priority to profit from the benefits of some IBC sides, and to connect with the European Business Network (EBN), the association linking the Business European Centres in operation, i.e. Newcastle Upon Tyne or Swansea.

The promoters of the Andalusian Park must cope with some difficulties due to the lack of a previous sound industrial infrastructure. To encourage the establishment of big companies or to achieve efficient start up ventures, the critical factor is the fund raising policies to obtain the financial resources to support the innovative projects or to launch the spin-offs from the big corporations.

The Financial Sector and Public Institutions provide the financing required and adapted to the various stages:

1. Seed Capital — needed in the first step to pass from the laboratory to the industry.

2. Venture Capital — to finance equity during the fast growing phase of the new ventures involving high risks.

3. Working Capital or Subordinated Loans — as ordinary financing in equity or subordinated loans in the period of fully developed companies.

On the other hand, public bodies cooperating with private Andalusian entities could provide the funding to build up the new Research Centres and the Technical Services Centres. Furthermore, public institutions are going to design the scheme to attract the industries in to the Park area, avoiding over-subsidizing the projects.

The high technical, commercial and industrial risks concerning the innovative process have led to preparation of strategies to reduce the risks involved. Professor Roberts of the Sloan School at M.I.T. has pointed out the importance of the entrepreneurial decisions to give access to the new technologies using

initiatives such as:

1. Licensing and joint venture, or limited partnership agreements.
2. Venture-capital actions.
3. Merge or acquisitions, to enter rapidly into a sophisticated marketplace or making "investments to learn" taking over the majority of the stock in a high-quality firm demanding equity financing.

In consequence, AP seems very relevant like training in management techniques to broaden the scope of the alternatives to obtain the innovation and to find the appropriate partner to match the most qualified markets.

The British Science Parks are a good model for establishment of the collaboration between universities and financial entities, such as Cambridge Science Park with the participation of Barclays Bank and the Industrial and Commercial Finance Corporation, or the Rotor Science Park case referred before.

One thing to point out is the importance of the financial regulations in the U.K. to boost the creation of new firms as a consequence of the Business Expansion Scheme (B.E.S.) consisting financial and tax incentives or the Management Buy-Out regulations that allow the access to ownership of very skillful management teams and the significant success of the over-the-valued market to deal with the stocks belonging to small and medium to resource corporations.

#### PRELIMINARY STRUCTURE OF THE PARK

The structure of the AP shows the operative units as a result from the previous conceptions of the Transfer of Technology Plaza. The Direct Technical Services to secure the transfer of technology among different agents involves some-critical activities:

3. Finding activities to look for appropriate advanced technologies to contact foreign partners to license or to invest in the Park. Currently, the managers of Andalusian Park are establishing preliminary initiatives to bring European leading firms into the Park. Among such initiatives are some serious contacts with relevant British core

panies.

3. **Licensing and Patenting** services to assist domestic companies or foreigners from abroad. Andalusia needs equity financing and technology, and the Park is the best way to reach agreements and contracts to license patents and know-how, to create new companies related with or using the information technology, and to establish commercial arrangements with local partners.

Andalusia has made a big effort to adapt its rules to the Common Market. The Patent Law and Intellectual Property Law was enacted in 1986, as well as the integration in the European Patent Convention. In 1988 the new law concerning the Semiconductor Layout Protection was approved in accordance with the EEC directives.

Attention must be given to the enforcement of the regulation about technology transfer contracts, that means the complete liberalization of the licensing agreements and the inclusion of the transferring activities as a subject of such regulation.

3. **International cooperation** is one of the key strategies to open the Park to the opportunities arising from the most advanced countries.

above all, the participation in the EEC Research and Development Programs such as ESPRIT, PACE, BRITE, or other European schemes such as EURIMA, and ESA (European Space Agency). It will give special importance to the programs to encourage the exchange of technologies, i.e. the SPIRENT, the strategic program for Innovation and Technology Transfer, to foster the transnational technical cooperation and to establish an European network of services for innovation.

The combination between the development of the Technopole and the SPIRENT potential could be very fruitful to disseminate the new technologies beyond the frontiers. Many of the most active institutions looking for SPIRENT partners are some British Business and Innovation Centre or local organizations to promote the regional economy:

- Barnaby Business and Innovation Centre.
- Lanchester Business and Innovation Centre.
- Sussex Productivity Association Ltd.
- Department of Planning and Economic Development (Trinidad District Council).
- NEDSIA (Aberdeen).

- Scottish Development Agency.
- At the beginning of 1988 a multinational group (PROMATESA) was set up under the rubric of the SPIRENT program, headed by a British firm operating in transfer of technology and innovative partnership, that includes a Spanish consultant company close to the Andalusian Park activities.

The Spanish perspective to build up several Technopoles, particularly Andalusian Park, is a practical framework to enhance the learning and joint-venture initiatives focusing on the next unique European Market in 1992.

By means of a realistic step-by-step methodology, Spanish Technopoles can become singular and harmonized areas including industrial facilities, academic and research institutions and sophisticated services related with the European programs to improve the dissemination of the applied knowledge throughout the whole of Europe. High technology industries may contribute significantly to the productivity and growth in the overall Spanish economy, increasing the efficiency of the traditional services and commercial services, helping to curb unemployment and training skilled people for new jobs.