

**PROMOTING COOPERATION TO ENHANCE COMPETITIVENESS IN A HIGH-TECH CLUSTER – THE INITIATIVE OF ENTREPRENEURS.**

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**ABSTRACT**

This work presents the case of the high technology cluster promotion of São Carlos, Brazil, the initiative to improve the companies competitiveness is based on the cooperation promotion. The difference of this case with the majority of the initiatives is that the idea of the cooperation promotion appeared among the entrepreneurial without the direct interference of an external institution, or government. The objectives of this project are: to develop the brand "São Carlos technology" and to increase the cooperation among companies.

**1. INTRODUCTION**

Encouraging the growth of small and medium enterprises (SMEs) is widely seen as being an important plank of industrial policy in many developing countries. The emphasis that has been placed on SMEs is also associated with the failure of the large scale manufacturing sector in meeting the aims to create jobs, improve welfare, alleviate poverty, raise incomes, enhance technical and entrepreneurial capacities as well as fostering key constituencies in civil society. The decline of the "gold age of the capitalism" set into motion various forms of economic restructuring (NADVI, 1995).

In the process of productive reorganization, great attention has been given to interconnections among companies in both, horizontal and vertical forms. International experience has shown that the strategies for promoting success in SMEs is based on collective incentive thus reaching not only company survival, but also a sustainable competitive growth.

This work presents the case of the promotion of a high technology cluster in São Carlos, Brazil, where the initiative to improve the companies competitiveness is based on the cooperation of promotion. The difference of this case is that the idea of cooperation promotion appeared among the entrepreneurial without the direct interference of an external institution, or government. The objectives of this project are: to develop the brand "São Carlos technology" and to increase cooperation among companies. The methods used are based on the experiences of other countries: Italy and Denmark.

**2. STRATEGY TO STIMULATE COOPERATION AMONG COMPANIES**

More and more companies are establishing close relations (formal or informal) with other companies in order to reach scale and scope economies, to be competitive in the market and to explore new markets. To improve inter-firms cooperation much effort has been made by the local, and national government, the institutions of support and the companies themselves.

The pioneering experience of inter-firms cooperation was in the North of Italy. The entrepreneurs in that region recognize that the success of these companies was reached

because of interdependence, collective vision, infrastructure, and support institutions. In the 70s and 80s governmental policy encouraged the cooperation, however the basic and social conditions necessary for the cooperation already existed (ROSENFELD, 1996).

With the great performance of the Italian companies, other countries tried to re-create the success, but most of them had a total different environment. Denmark, does not have a great concentration of small companies in one place, and the entrepreneurs do not have the family ties that are characteristic of the Italian companies. So they developed a new form to stimulate the cooperation between companies. Therefore, two models, developed in different environments appear:

- Italian Model - culture allows for the cooperation. Local State was important in institution-building and in the development of collective service centers. The support services are important to the dynamic of the cluster.
- Danish Model - external incentives to generate collective activities between companies. Networks of "brokers" are formed, and incentives are granted for companies, in groups of three or more that engaged in collective activities that lead to expansion or to reach new markets.

Both models became reference worldwide and some countries are implementing strategies based in these experiences. Following is a brief description of these models to be compared with the experience that is being developed in São Carlos.

## 2.1 ITALIAN MODEL

HUMPHREY & SCHMITZ (1995) highlight that the literature about the Italian experience emphasizes the role of the local and regional government in providing a framework in which clusters can flourish, supporting the building of institutions and developing collective service centers. However they also affirm that Italian clusters not appeared as a result of a consciously pursued local or regional industrial strategy, but through a process of two stages: spontaneous growth with accumulation of companies and institutionally enhanced growth. Thus, the policy implications in the Italian experience had not resulted in the emergency of clusters, but with the path they took once they existed.

Therefore, the policy adopted had emphasis to improve the performance and the dynamism of clusters and to improve the responses to new challenges. In this case, there was already a strong basis on which policy could work. A vertically disaggregated yet linked production system was already in place. Policy was built on these linkages. It supported or enhanced the dynamism of the district, but it did not create it.

The example of CITER (Centro Informazione Tessile Emilia-Romagna) illustrates what occurs there. The center provides five major services: it edits a mid-year periodic report on international market trends and on activities of competitors at home and abroad; it informs artisans about the prices and nature of yarns which are available on the market; it keeps members informed on technological developments, by preparing technical notes on relevant machinery and by collecting relevant literature; it has a CAD/CAM station for use by its members; its informs the local business community about the fashion trends.

Therefore, the role of the CITER is to collect, analyze and distribute all relevant information to this community. Initially, in 1980, the CITER was financed with public funds, and after one decade of functioning only 30% of its budget came from governmental. Now the members are the responsible ones for the functioning of the center, that is made through subscriptions or payment for jobs (HUMPHREY & SCHMITZ, 1995).

## 2.2 Danish Model

Denmark became a political reference stimulating SMEs with a governmental program that began in 1993 in order to stimulate the formation of company networks. The program started because they recognized that the SMEs are the back-bone of the Danish economy, and they are badly equipped to face global competition.

Company networks were thought to be the definitive reply to increase the competitiveness of companies and to create new business opportunities. The main problem was that on that country the cooperation was not part of the industrial culture. The program had to surpass the resistance to cooperation. With the aim to increase the interest of the entrepreneurs in relation to the networks, some examples of excellent initiatives for the local companies had been told. Another critical point was to identify viable ideas of networks. A third point was to convince group firms to implement an idea and develop it, and also to convince the companies to carry through a feasibility study before the implementation (HUMPHREY & SCHMITZ, 1995).

The main actors of this program were "brokers", people who had been trained to identify a group of companies with similar growth restrictions and features. With the identification of business threats and chances for the companies, it is possible to trace designs for common development. The broker has to identify potential companies for an networks formation, following the formularization of the program design, implement the action plan and actively participate in the contact with institutions for credit and training supply (CEGLINE & DINI, 1999). The design has limited time to be implemented, and after this time the network has to be self-managed, it will no longer count with the "broker" nor with the government subsidy. Therefore, in the program design the process of "network privatization", must be clear when the entrepreneurs of the network assume the role of "brokers" and which will be the sources to continue the network jobs.

The United Nation for Industrial Development Organization (UNIDO) has promoted programs to stimulate cooperation between SMEs in some developing countries, and they use the Danish model. The programs are, according with CEGLIE & DINI (1999), for the promotion of efficient relation systems between companies, and companies/institutions, that allow the companies to surpass the isolation and to reach collective competitive advantages. The methodology consists of four steps that will be detailed as follow:

1. The promotion of networks
2. The restructuring at the firm level
3. The improvement of the institutional environment
4. The improvement of dialogue between the public and private sector

### 1. The promotion of networks

Initiate and develop effective relationships among independent entrepreneurs based on collaboration and production integration. The central element for the development of a network is the creation of sufficient trust through a process of mutual learning which can be suitably stimulated and guided by an external agent (the network broker) trained to perform such a function.

In order to create a relationship based on trust, entrepreneurs need to be exposed to an interactive process stating with a "role assignment", leading to "criticisms based on an analysis of results" and, finally, to a "reassignment of responsibilities" within which they can assess empirically the capability and commitment of their partners.

## 2. The restructuring at the firm level

In addition to engendering a collective advantage, network creation often also brings about a transformation within the individual member enterprises aimed at adapting their production and organizational capabilities to the requirements of the common objectives. Group pressure will stimulate individual enterprises to fully commit to implementing the necessary improvements and will sanction members for failing to accomplish common objectives.

The enterprise restructuring can also contribute to improve network prospects.

## 3. Improving the institutional environment

The external institutions play a pivotal role at the level of direct assistance to the enterprises. They are agents who facilitate the generation of the networks.

The external institutions support the realization of the network's work plans requiring a wide range of technical and financial services. It is the task of the networking unit to ensure that networks can draw the assistance they require from within the environment that surrounds them. In a relatively weak environment, this task often implies upgrading the capacity of specialized service centres or, in some cases, even bringing about their establishment.

## 4 Improving the Dialogue between Public and Private Sector

An fundamental component of a cluster project concerns the establishment of cooperative relations between the public and the private sector. The aim of such relations is to promote the emergence of a coordinated industrial policy and identify, develop and implement coherent actions to support the entrepreneurial effort.

### 2.3 LESSONS LEARNED

The authors - HUMPHREY & SCHMITZ (1995), CEGLIE & DINI (1999), NADVI (1995) - point out conclusions about the European experiences that may prove useful in designing future network/cluster projects, the main advice are below.

An important principle in the project and provision of networking development services is demand orientation. The projects must be flexible and vary from network to network and from cluster to cluster, depending on the nature of the constraints/objectives of the client base. One important requirement is that the intervention must be designed after an analysis of the needs of the client base and the surrounding economic environment from which resources can be tapped to satisfy those needs. Furthermore, the actions must be:

- Business orientation – refers essentially to two components: the networking must aim at visible improvements in the economic situation, and it must grant the group a new competitive advantage which the enterprises alone could not reach, and these advantages do not be short term, but involving a process of continuous improvement.
- Focus on production – points to the importance of process and product innovation and structural improvement as opposed to and increase of sales resulting from an occasional participation in a fair.

The best way to finance networking development services is a combination of private and public investment. The public financing is important mainly in the beginning of

the project, when the results are not so visible. However with the development of the project the public sector can diminish their financing share and private sector higher.

Lastly, there is no single and pre-defined path to be followed in the implementation of cluster/network promotion initiatives that can be effortlessly replicated across countries, regions and industrial sectors. These initiatives need to be flexible and in tune with the characteristics of the environment where firms operate.

### **3. PROJECT PROMOTION OF HIGH TECHNOLOGY CLUSTER OF SÃO CARLOS**

São Carlos holds 70 high technology enterprises, agricultural instrumentation research center, 2 important universities that have research endeavors in engineering and exact and biological sciences, and an array of high technology companies. These high technology enterprises work on the most diverse sectors, from software producing companies that also participate in Internet, to companies that manufacture automated automobile industries.

#### **3.1 HIGH TECHNOLOGY ENTERPRISES**

High technology companies are understood as being enterprises that specialize in offering products and services that came about as *spin offs* or universities or large enterprises in the electronic, software, biotechnology and internet areas. They are companies specialized in supplies and normally maintain a strong bond with universities and laboratories for product/process development.

The administration of these companies face two strategic problems:

1. Long-term growth. Few companies based on high technology become large companies, because they supply specialized areas that do not hold synergies with other markets. Their life-time will depend on their transition ability from the first to the second product generation and in the support of administrative competence development.
2. The owners choice between maximizing the business' long-term value or increasing only the earnings and attain independency. Many owners sell their businesses after the initial success.

For the companies that choose long-term development, it is essential that they establish a link with new products and processes as well as an internal team that absorbs outside information and fits them in the organization as a whole.

#### **3.2 CLUSTER PROJECT – OBJECTIVES**

The project of high technology cluster promotion came about from an idea two company administrators had: one that develops web based software for corporations and the other that implements access control through smart cards. The administrators of these companies noticed that due to them being very specialized, lost business deals that needed other specialized services, and that in São Carlos the majority of the companies are not direct competitors among themselves because they complement each others in specialties, so, if there were a larger integration between companies, it would be possible to develop joint products so as to meet market gaps. As a result, not only the enterprises would benefit, but the entire region as well.

The São Carlos Cluster Project has two main objectives:

1. To promote the São Carlos label as being a region that generates high quality technology for the global and local market. The steps to follow are these:

- Company and public/private institution involvement for local production development.
  - Project joint ventures of companies and projects
  - Formalizing cluster
  - Development of continual market divulgation of cluster
2. Capacitate cluster for global competitiveness. The steps are the following:
- The making of an information center that will chart company competence within cluster, seeking out market opportunities, generating new business among companies that will achieve market opportunities
  - Development of common process of quality and certification for research, sales and post-sales
  - Development of a common training area.

It is important to describe what the information center is and how it will operate.

The objectives of the information centers must coordinate endeavors among companies, among enterprise/institution and among enterprises/market; acquire and divulge market information to enterprises/institutions. The functional structure of the information center is divided into several areas with specific objectives:

- Judicial: will subsidize actions among all institutions and in relation with the market with legal instruments
- Supplements: development of joint achievements to supply companies
- Marketing: will divulge company competence belonging to the São Carlos cluster
- Market intelligence: acquire and divulge opportunities that come up in the local and global market for companies in the region
- New Businesses: will support cooperative projects among companies coordinating integration between partners.

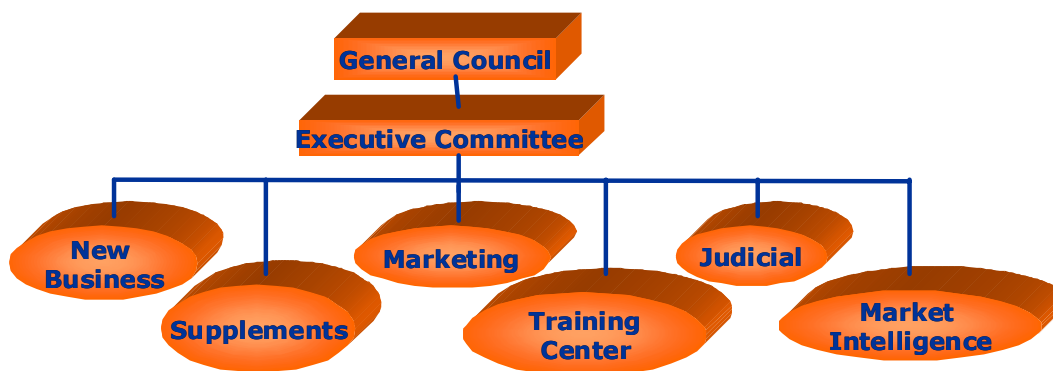


Figure 1 – Organization of Information Center

The information center is achieved from two financing sources: the companies that will adhere to the project and that will participate in cooperation projects in order to explore new business opportunities must give a percentage of the economical advantages for the maintenance of the information center; and through projects sent to financing agencies such as FAPESP, CNPq and etc.

### 3.3 PROJECT METHODOLOGY

This project will be developed based on some aspects of the Italian model as well as the Danish model, however, there are certain peculiarities that lead to develop their own methods.

The project has an implicit specificity in its conception. Normally, the promoting of cluster projects come from public institutions that seek a better regional development, in this case, the project was conceived and is being developed by private enterprise that aim to increase their businesses as well as those of the region so as to make the region and their businesses more exposed to the local and global market.

As in the Italian case, São Carlos has a group of enterprises that work with high technology and what it needs is to increase their dynamism and improve company response to market challenges, so it is necessary to strengthen communication among the productive echelons, or even create these means. A drawback for the project, as it was for the Danish, is to overcome cooperation resistance. However, in this project, there already exists an extremely relevant initiative of two enterprises that are heading the project and are developing it jointly in order to meet important clients.

The information center will be a service supplier for the cluster, acquiring market trends – technological, market-wise, financially, etc; operating cluster marketing; developing joint ventures, such as joint purchases; judicially supporting the participants of the project; supporting the contacts companies make with institutions in service search and financial agency support for the projects among companies of the cluster; carrying out training to increase qualification of companies in the cluster, but also selling training that may be offered by the participating companies of the project. The center will also act as a broker that will identify market opportunities, surveying company competence that could lead and help in the implementation of this plan. The information center would act as a facilitator between enterprises/institution/market.

The role of broker will be essential at the beginning of the project because the objective is to bring incentives for the companies to work jointly so as to create trust, and after this becomes a reality, the companies will be able to carry on the joint projects without a broker. In this manner, little by little, this function will be passed on to the enterprises.

The project also aims to improve the individual productive and organizational capacity of the companies. In order to achieve this a common process will be developed for quality and certifications, this way, SMEs will be compatible to develop joint works and be able to meet the demand for new businesses.

### 3.4 EXPECTED BENEFITS

The advantages of the São Carlos cluster project can be categorized for: enterprises, region and institutions.

1. *Enterprises* – Company expansion through complementary pursuit and economy with joint investments; productivity increase by means of improved information access, public products and specialties; improvement in market perspective view and market information, making better opportunities more visible; new businesses: due to better market comprehension, market faults, and complement competences.

2. *Region* – larger regional development with the increase of enterprise activities of the cluster (new businesses and innovation) increase of company “premium price” thus increasing regional wealth; improvement in quality of life; enhanced exposition of regional potentiality through marketing carried out by the cluster.

3. *Institutions* – the institutions in São Carlos (Municipality of São Carlos, USP, UFSCar, Fundação ParqTec, Fiesp/Ciesp, Embrapa, Núcleo Softex, Sebrae, Acisc, Work Unions) may benefit with the increase of enterprise activity.

### 3.5 CURRENT STATUS OF PROJECT

The objectives of the project were structured throughout many meetings among the administrators of the two enterprises that generated the idea ParqTec Fundação e Núcleo Softex. At the end of October the idea was presented to the Municipality, USP, UFSCar, Sebrae, Embrapa, Fiesp/Ciesp, and various companies of the city of São Carlos during an event that divulges products and services produced in the city.

During the presentation, other companies became interested in the project and will actively participate in the formation of the cluster and information center. The Municipality will also back-up the project, at first divulging and committing itself with the products and services produced in the region. ParqTec Fundação gave a place for the implementation of the information center, and a doctorate grant for a student to write projects to get the project started. The projects will be forwarded to financing agencies. The center will be easier to view after the initial pilot-project that is currently being studied and developed by the two pioneering companies of the project.

## 4. FINAL CONSIDERATIONS

The Italian and Danish cluster models are two good successful references for the implementation and promotion of SMEs based on cooperation. These models serve as basis for any country that aims to increase sustainable competitive capacity in companies.

In the Italian experience an important factor was to adopt policies for service improvement; while in the Danish model, there was an emphasis in direct interference by means of company relationships. Although the São Carlos project did not come about through regional politics, it came through the will of some entrepreneurs seeking to utilize these two tools jointly so as to stimulate cooperative works: an information center that will also act as a broker.

This model is being developed and becoming viable not only through public and private investment, but also through a combination of these two. Through public support – financing agencies – a center of information will initially be possible so as to allow the development of the first phase, from this experience the collection of private funds will be carried out, because a part of the benefits will be allotted to the center. With the success of the first project, it is easier to include more projects and enterprises that can participate in the project and thus the collection of private funds will increase. A drawback to this project is the non-existence cooperation culture among entrepreneurs, that is why it is important that the initial project bring beneficial results and thus show that cooperation brings excellent economical results.

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