

Consumer Electronics in Catalonia

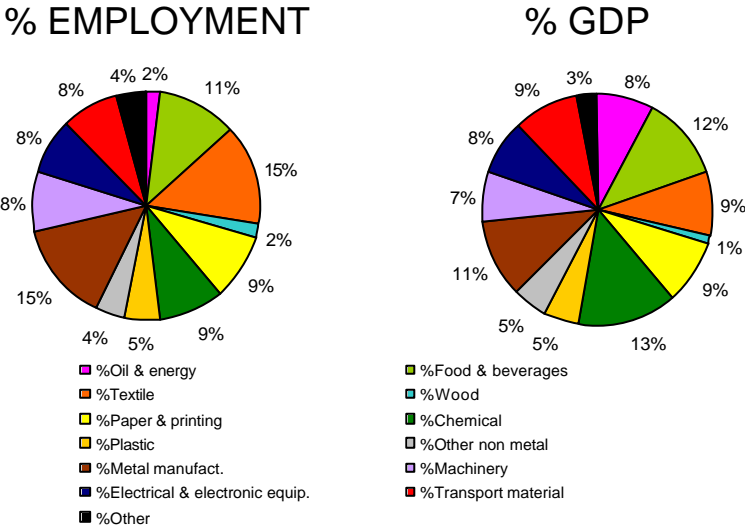
Background

The general business environment

Political and Macroeconomic Environment

Catalonia, one of the seventeen Spanish regions, enjoyed a high degree of autonomy since 1977, when it was reestablished the Generalitat, a political institution for the self government of the region.

With a population of around 6,5 M. inhabitants, approx. 15% of the Spanish population, Catalonia accounts for 19,3% of the Spanish GDP in 2001 (and 26% of Industrial GDP). Industry represented more than the 28% of the total both in term of GDP and in term of employment . Catalan exports is also near to 28% of total Spanish exports while industrial FDI (foreign direct investments) represent 14% of total. In term of sectorial composition of the industry chemical, metal manufacturing and food are the most relevant industry representing more than one third of the GDP. Electronics and electrical equipment accounts signify less than 10% both in term of employment and GDP share.



Source: IDESCAT, 2001

Exhibit n.1 – Sectorial composition of the industry in Catalonia. Source: IDESCAT.

At industry policy level Catalonia was one of the first pioneer regions in Spain and worldwide in promoting cluster centered development policies and by 1995, when the first consumer electronic cluster project, was started more than ten cluster reinforcement initiative were already carried out mainly in manufacturer industries (see exhibit 5).

In term of Research and Development (R&D) Catalonia presented a better situation than the rest of the Spain accounting for 20% of the total country's expenditure and with more than ¼ of the companies classified as "innovators" by the National and Regional Statistical Institutes (INE and Idescat).

In term of education offer, Catalonia hosted three main universities (*Universitat de Barcelona - UB, Universitat Autònoma de Barcelona - UAB and Universitat Politècnica de Catalunya – UPC*). The UPC and another smaller university, University Ramón Llull , had Bachelor degrees in Engineering and Telecommunications. Both universities maintained fluid relations with the industry and their students were offered work in practice and projects in many of the electronic companies of the cluster

The cluster

Historically Catalonia was the first manufacturing centre of an incipient consumer electronic industry in Spain (first for radios and then for TVs). This created a first industrial base of electronic components suppliers (mainly valves, condensers, loudspeakers and some base components for radio receivers.) that also worked for other industries like automotive, motorbikes, rail, etc.....

The rapid growth of this industry and consequently of the consumer electronic cluster is reflected by the increase of TVs production: from 40.000 units in 1960 to 350.000 in 1963. The current consumer electronics cluster has, however, its origin in 80's when several companies (mainly Japanese and Korean like Sony, Panasonic, Sharp, Pioneer, Samsung with the exception of one American company, Hewlett Packard) decided to invest in the Vallés county close to Barcelona (see exhibit 2 below)

Thanks a strong investment attraction policy (supported by different action at environmental level such as, for example the creation of a Japanese School, to low salary costs and to an active and targeted marketing of the Catalan Government), in 1995 the consumer electronics clusters in the Vallés area included more than 50 companies whose revenues had reached 600 mill.€ employed around 5.000 workers and accounted for 78% of the consumer electronics production in Spain. Additionally, the cluster included other agents like: associations, educational centers, laboratories. A brief description of these agents is outlined below.

LGAI (General Test and Research Laboratory)

Its main functions were the following:

- Test and analysis of industrial products and materials (certifications, official approvals, ...)
- Cooperation in training of technical workforce, through the organization of courses and seminars
- Research and studies in cooperation with educational centers

ANIEL (National Association of Electronic Industries)

This organization, founded in 1973, had the mission of protecting the interests of the affiliated companies and promote the development of the electronic industry, acting as intermediary with the Administration. The association had its headquarters in Madrid, although had also local offices in Barcelona.

ASCAMM

The association of Mould and Die Manufacturers of Catalonia had as its mission increasing the competitiveness of companies and organizations in the metal and plastic processing sectors as a whole and particularly within the mould and die industry. ASCAMM provided training, assessment and certifications and conducted significant research in its Technology Centre, created in 1987.

TV3

The regional television channel played a double role in the electronic sector: as a catalyst of new technologies and as a user of them. As a catalyst, it established some cooperation with manufacturers for the development of new standards. In this sense, TV3 was going to work with Hitachi and Pioneer for the introduction of dolby surround. However, they had not established a structured framework for cooperation with the companies in the cluster, and the lack of a fluid dialogue had prevented the coordination of new standards and the availability of the product in the market.

A diamond analysis of the business environment (with reference to year 1995 when the first initiative of cluster reinforcement were launched) of the Consumer Electronic Cluster can be summarized in the following points:

Context for Firm Strategy & Rivalry

A relevant number of manufacturers (including Sony, Pioneer, Samsung, Sharp, HP, etc.) that operated in the cluster addressed global markets with general products. Very scarce level of cooperation among manufacturers in the cluster. There was no association and periodic meetings were not promoted.

Demand Conditions

There was no optimal connection between market and manufacturers, and no association to promote this relationship. Cooperation with TV3 was fundamental for these companies, and had helped many developments, but it did not count with a formal structure and was not fluent.

Factor Conditions

Initial conditions were good even the cluster competitiveness was too based on cost advantages that will be rapidly disappear in the context of business globalization. The personnel working on the cluster, especially technical staff was quite qualified also for the presence of technical universities, nevertheless their mindset was not enough global and engineers with English proficiency were too scarce.

Related and supporting Industries

Despite a diffused network of suppliers one of the main problems for the manufacturers in the cluster was their inefficient logistics and the time of delivery. This was also caused by the fact that suppliers (i.e. mould makers) were not focused on this. Too fragmented and too small suppliers didn't respond to the need of the severe requirement of global manufactures like those present in the cluster.

Finally the certification and technological institutes present in the cluster and the industry associations were not able to give adequate responses to the cluster needs.

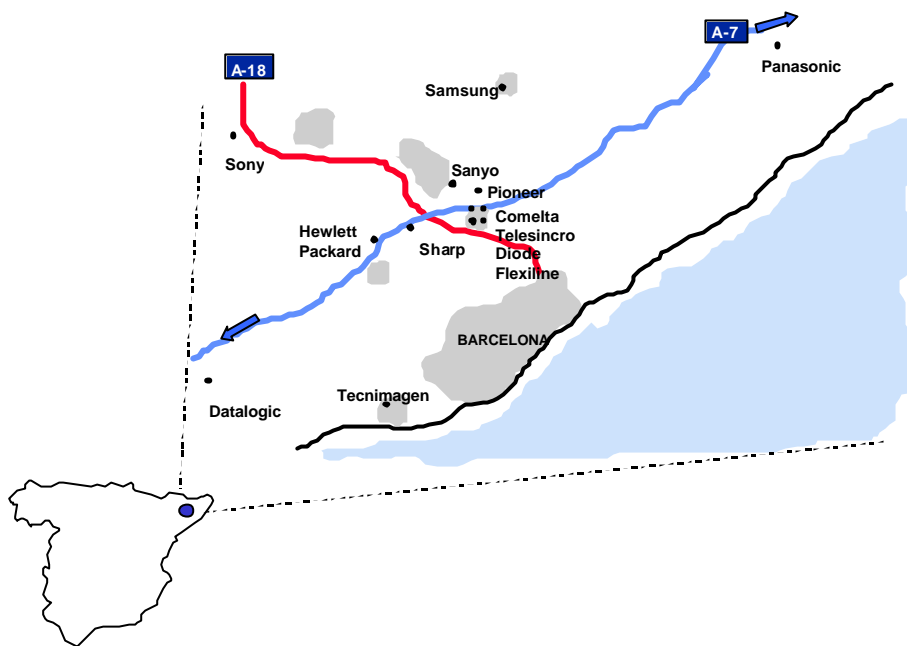


Exhibit n.2 – Location of manufacturers in the Consumer Electronic Industry in Catalonia. Source: Competitiveness

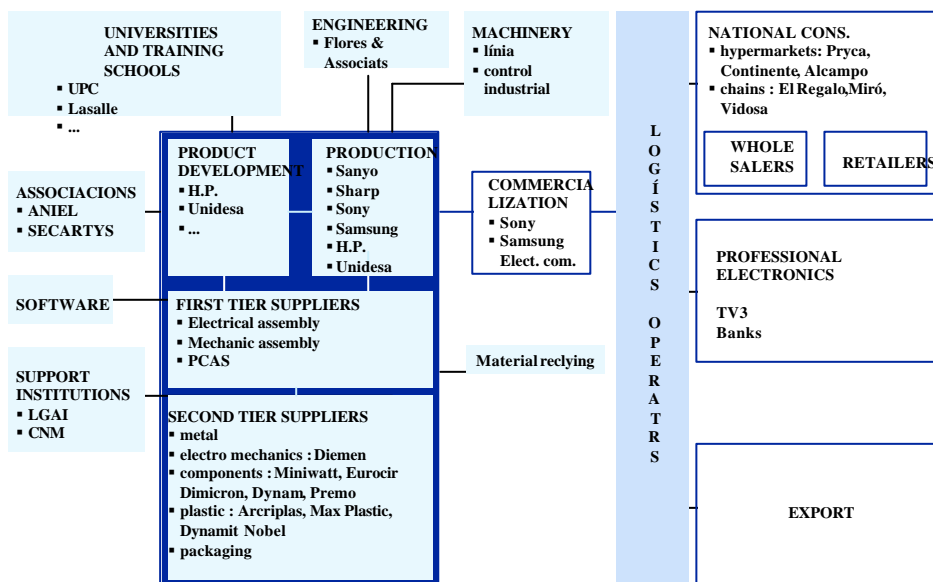


Exhibit n. 3 – Main agents of the Consumer Electronic Industry in Catalonia. Source: Competitiveness

Objectives of the initiative

The overall purpose of the initiative was, according to the industrial policy approach carried out by the *Generalitat de Catalunya*, to improve competitiveness of cluster. In particular this initiative was centered in the reinforcement of cluster's supply chain. In fact as OEMs were forced to reduce their time to market for new products they needed faster and more reactive suppliers.

The initiative was, therefore, mainly addressed to the supplier's networks present in the cluster and was focused on giving them a strategic vision about the evolution of the business and the new challenges ahead. Nevertheless, the OEMs present in the cluster strictly collaborated with the Government by assuring their involvement in the project especially through a direct participation of people from technical and R+D centers and purchasing departments.

The cluster reinforcement process was carried out in this particular cluster in different phases each one with precise objectives linked to the specific domains to be strengthen.

- A first cluster reinforcement initiative was launched in 1995. This initiative was mainly addressed to reinforce the overall competitiveness of the cluster and particularly in improving the companies' capabilities in design and product development from a technical point of view. Another major objective of this project was to analyze the suppliers' key competitiveness levers in the mid term (i.e. in the next 3-5 years) regarding quality and cost of the output. This first initiative was a sort of strategic reflection mainly address to suppliers and, taking advantage of the cluster dimension, carried in group instead of individually
- A second initiative, carried out in 1997 in coherence with the lines of action defined in the original project of 1995, was specifically addressed to train a restricted group of suppliers in order to improve their competitiveness. A selected group of mould makers suppliers belonging to the Consumer Electronic clusters participated in a tailor-made training program addressed to improve the cost and quality of their products and, overall, to reduce the time of development of new products. The program included a benchmarking trip to a more competitive cluster in Far-East (Singapore).
- A third initiative launched in 2000, was mainly addressed to update the strategic analysis made in the first project. In fact, since globalization and liberalization forced the relocation of the production in low-cost countries (and is this specific case in Eastern Europe). This facilitate the development of new players in the industry such as Contract Manufacturing that developed not only manufacturing and assembly abilities, but also logistic and post-manufacturing ones. This new situation forced the producers to concentrate on added value activities like R&D, design or marketing.

DIFFERENT INITIATIVES OF CONSUMER ELECTRONIC CLUSTER REINFORCEMENT

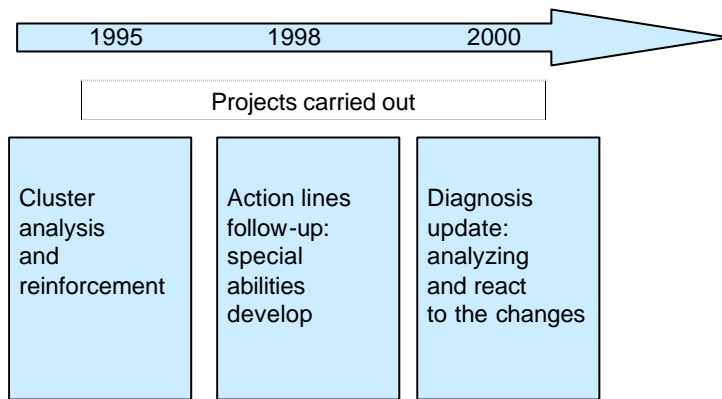


Exhibit n. 4 – Different initiatives carried out the CE cluster from 1995 to 2000

Other horizontal objectives like innovation promotion, technology diffusion or technical training were, of course, promoted and searched along all the process.

Process issues

Initiative and governance

The initiative was taken in all cases by the Regional Government of Catalonia (*Generalitat de Catalunya*) and particularly by the Department of Industry that led the initiative together with the OEMs involved in all the process that, through their dialogue with the Administration, expressed an interest toward the implementation of an initiative of this type.

The overall framework of the project was financed by the Regional Government. However, some specific follow-up actions (and particularly the training initiative) were co-financed also by the suppliers companies, the OEMs and a technological institute.

This initiative was the 12th cluster reinforcement initiative carried out by Regional Government with the same methodology in a wide array of industries (see exhibit 5 below).

CLUSTER REINFORCEMENT POLICY CARRIED IN CATALONIA (1993-2003):

24 MICRO-CLUSTERS

MORE THAN 3.000 COMPANIES INVOLVED

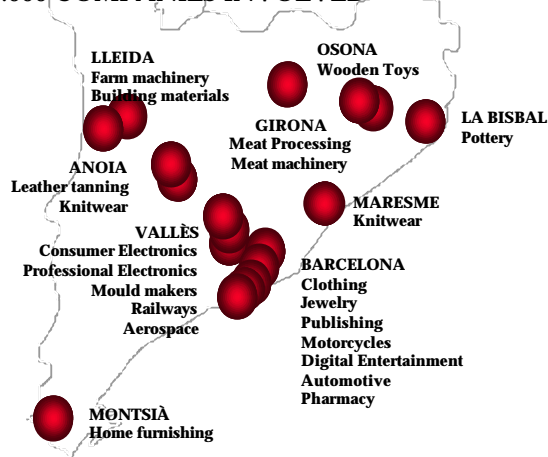


Exhibit n. 5 – Cluster reinforcement initiatives carried in Catalonia (1993-2003)

Delimitation of membership

The overall initiative involved a very wide range of actors. In fact, despite the main target of the initiative were the suppliers of the consumer electronic industry, a variety of other subjects belonging to the cluster played an active role in the initiative: OEMs, that collaborate directly in the initiative, assist the dialogue at technical level and facilitate the global scope of the analysis; technological and testing centers, universities, engineering companies, industry associations, etc.). The consumer electronic cluster is mainly located in the Vallès county located in the northern environs of Barcelona.

While the initiative's main target were small and medium companies (mould makers), the project involved also the local plant of the biggest OEMs of the industry with plants in Catalonia including Sony, Hewlett-Packard, Sharp and Samsung among others.

Resources and organization

The initiative were financed at different stages. The initial project, designed as a more typical cluster reinforcement initiative was carried out in six months with an overall budget of € 90.000.

The main activities implemented during the project included strategic and environmental analysis, an international benchmarking trip and a series of working group by topics. The initiative, as almost all carried in Catalonia, did not rely on any physical structure nor on a cluster manager. Each of the involved actors (Regional Government, suppliers and OEMs)

took the leadership for the implementation and follow-up of the different actions defined at the end of the project.

This approach allowed the launching of a relevant number of working groups responsible for different lines of actions using only a very limited budget. Concrete and more targeted projects identified as a result of this initial work were, in some case, financed with more funds by the Regional Government with a separate budget.

A summary of the main phases of the initiative is outlined below.

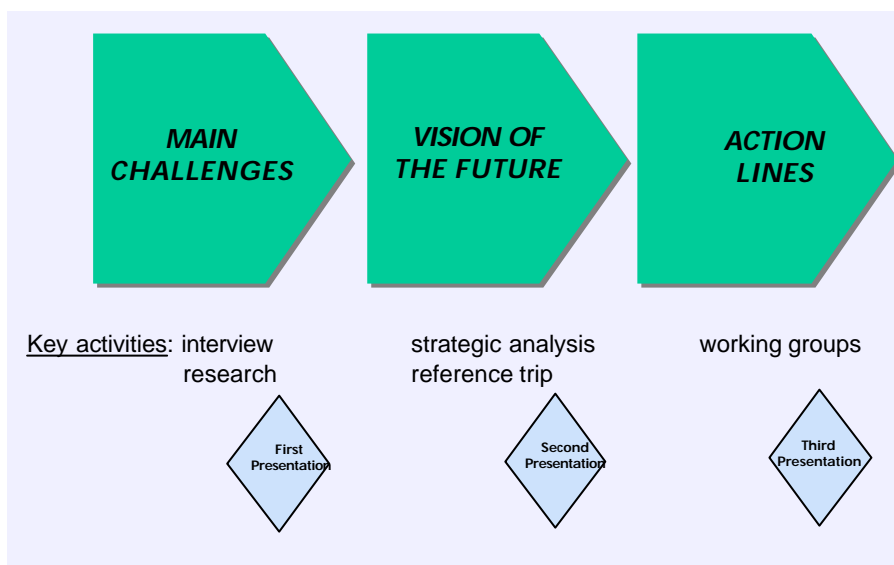


Exhibit n.6 – Main phases of the cluster initiative. Source: Competitiveness

Facilitators

The entire process was driven by the Regional Government through the involvement of its personnel. A consultancy, specialized in cluster reinforcement, and hired by the Regional Government acted as facilitator during the entire process.

The consultant company, Cluster Competitiveness, handle the entire initiative both in term of analysis and of facilitation and networking process (meetings, work groups, identification of leaders for each action line). Mr. Montagut, Deputy General Director of Industry, supervise the entire process often with his direct involvement in presentations, workshops and benchmarking trips.

Cluster Competitiveness' consultants responsible for the implementation of this initiative were MBAs graduates with relevant experience in industry and cluster strategic change methodology while there had no specific experience in the industry.

Technological and specific industry expertise was provided by technological institutes or by the same OEMs.

A shared framework

The establishment of a shared framework has been certainly one of the main efforts made by the initiative's facilitators. This cluster reinforcement initiative, as all those carried out in Catalonia (and in other Spanish and European regions), is structured in three milestones (see exhibit 6 above) that end with public presentations to all the actors present in the cluster:

The first phase is dedicated to mapping the cluster and identifying the main actors (mainly the companies) and involving them in the project.

The second phase is focused on the strategic analysis of the cluster (it includes analysis of the industry, business segmentation and the evolution of the strategic options at cluster level). The output of this second phase normally shared in a public meeting should include a joint strategic vision of the industry.

The third phase is addressed to the definition of a series of action lines coherent with the shared visions (in this case, if reduction of time to market is the key issue for the competitiveness of the clusters, all the action lines should be oriented to reinforce this area: better coordination OEMs; development and tapping of new IT tools by suppliers, the design of a more focused training for engineers in 3D CAD workstations, facilitate investment in Rapid Tooling or Rapid prototyping machines, reduce time for testing moulds, and product certifications,...).

A government agenda

This project was part of a series of cluster reinforcement initiatives carried out by the Ministry of Industry of the Catalan Government starting from the beginning of the '90s. By 1995 a dozen of similar initiatives in different industries were already carried out with a similar methodological framework. Currently (July 2003) the number of cluster reinforcement initiatives carried out in Catalonia is 24.

Partially thanks to the continuous strategic reflection made at cluster level in a variety of industries, in more recent years the Regional Government of Catalonia has defined and launched a series of horizontal initiatives and areas of action (particularly: innovation management process, quality in manufacturing, exports promotion) addressed to respond to concrete needs and the main future challenges of its companies. It is interesting to observe how these tools and their definition have arisen more from a bottom up analysis rather than a top down approach.

Commitment

While the Catalan Regional Government hasn't changed its majority party in the last 15 years, its approach regarding industrial policy has been based on a very low degree of interventionism. The *leit-motiv* has been often the empowerment of companies and industry ("*if companies don't lead action lines we will not support them*").

Moreover, Catalonia cluster approach model has always been based on lean and flexible structures at cluster level and trying to avoid adding unnecessary actors in the cluster

environment. Practically, no cluster manager or cluster association have been appointed or created.

This approach that allow a great flexibility at industry level, present some inconvenient in terms of cluster monitoring or follow-up since private companies (especially if there are SMEs as it is the case in most of the clusters) didn't have enough time to follow up initiatives and unfortunately some of them could be abandoned for the lack of follow up.

Development over time

The consumer electronic cluster in Catalonia is a very clear example of dynamic initiative. The first cluster reinforcement initiative lunched in 1995 make a comprehensive analysis of the cluster, of its competitive advantages and of the main challenges of the industry in the mid term. Nevertheless, an important change in the industry made necessary a second intervention aimed to analyze new important actors appeared on the scene and how they were influencing the way of competing of the local companies.

In particular HP closed its manufacturing plant and transfer production to Hungary. However, HP decided to kept and even to reinforce its worldwide R+D plotters centre in Barcelona also thanks to the work carried out in 1995 at cluster level. In fact one the areas addressed by this first cluster initiative was precisely design and R+D capabilities improvement as well as time to market shorten rather than manufacturing excellence. Similarly Sony has established its European Digital TV centre in Barcelona with more than 100 engineers while in 1995 it has juts a manufacturing plant. The cluster has evolved from a just manufacturing cluster to a design and R&D one.

Additionally new players have invested in the cluster: contract manufacturers coming from US (Flextronics) or Singapore (Venture). Both these international players are producing for HP in Hungary and Singapore, but they should have design engineers in Barcelona.

Probably the current number of employees in the cluster is lower than in 1995, but certainly the average added value is significantly higher.

Performance

In general terms the overall process had a positive impact for the consumer electronic cluster.

The main goal of the initiative, to reinforce the competitiveness of the cluster supply-chain, was reached and, despite the delocalization of some production plants the cluster is still very active. Various OEMs has made new investment in their production plants (Sony, Samsung, etc.), while, as mentioned, a part of the cluster is concentrating in more added value activities like R&D and design.

In term of economic growth the cluster presents now a positive balance:

- the turnover is almost 1 billion € while was approx. 600 M € in 1995 and the added value per employee has certainly improved.

- On a strategic point of view the cluster is evolving from a mere manufacturing cluster to a design and R&D intensive cluster. This has certainly a positive follow-up in the business environment and contribute to reinforce the diamond of cluster and of the same cluster and of other related industries and clusters.

By contrast, some problems, particularly a too fragmented network of suppliers or the lack of electronic components providers, are still on the cluster agenda.

In summary, it can be argued that the strategic analysis carried out first in 1995 and its update five years later (in 2000) was certainly a clear driver for the success of the entire cluster initiative. A close monitoring of the evolution of the business allowed to implement the right responses in time and to facilitate the evolution of the cluster business. In fact, since it was clear that this cluster (similarly to many others located in advanced regions) couldn't compete in low production costs, the analysis of the first initiative suggested to concentrate the efforts in design and R&D activities and, in particular in reducing time to market that seemed one the key success factors in the consumer electronic industry.