HIGH ROAD TO WORK ORGANISATION

CASE STUDY

The Electronic Cluster In The East Sweden Region

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Nomisma

September 2001

Abstract

The case study refers to a "cluster-oriented" approach to the local development in a small Sweden region and it is interesting for a number of reasons: the cluster of the electronic products is relatively new and still growing; moreover, the cluster development is also the result of a very focused policy, strongly supported by relevant local actors; finally, this emerging cluster benefits from some key local factors (namely the University and business incubators) and from the positive impact of some extra-regional inward investments.

HI-RES Case Study: THE ELECTRONIC CLUSTER IN THE EAST SWEDEN REGION

Sector

Electronics

Key Words

Clusters; inter-organisational structures; institutional change; local development;

Table of Contents

1. Background Information

East Sweden, with the main cities of Norrköping and Linköping, are situated south of Stockholm with access to the growing markets in the Baltic area (of more than 80 millions people). East Sweden industry is characterised by a combination of traditional sectors and high-tech profile, in which there is a combination of big multinational companies and small and medium sized enterprises.

Linköping is the seat of a big University, which is a relevant actor in the cluster development.

The region has a long industrial tradition in industrial manufacturing, even if the sectoral specialisation was mainly on the traditional sectors of forestry industry and textile-garments. The region still has a strong agricultural sector and forest industry. The decline of these sectors during the '70-80s has forced the local authorities to foster the development of new manufacturing and service companies.

Employees by sector in East Sweden - 1998

	%
Agriculture	3
Manufacturing and mining industry	25
Electricity, water e waste processing	1
Constructions	5
Telecommunications, transport and trade	17
Financial and business services	9
Research and educational services	9
Health care and social services	24
Public Administration	5
Not classified	2
Total	*100*

Source: Invest in Sweden Agency

The modern manufacturing sectors in the region are now:
- Military aircraft industry,
- Precision tools for electronic industry.

New sectors have grown recently in the region:
- Electronic industries,
- IT and software industries (mainly based on small and medium sized companies),
- Medical equipment industry.

More than 500 computer companies are located in this region, that ranks high when it comes to using Information Technologies.

Among these emerging specialisations, some are considered by the local institutions as "world class"; in particular: ICTs industry, electronics and aerospace.

According to the local development Agency, there are 5 clusters in the region, specialised in:

- Aerospace,
- Information and Communications Technologies ,
- Electronics,
- Life science technologies,
- Software,

Nevertheless, it seems that some sectors –i.e. electronics, software and ICTS- are strictly interconnected and eventually they could be considered as an integrated cluster of the

electronic products and applications, in which the focus on the Information Technologies is dominating.

2. Drivers for Change

In the cluster development of this region, some key actors have been playing a relevant role. In particular:

- The University,
- A local development Agency, focused on the attraction of inward investments,
- A formal network of local institutions (including –apart from the above mentioned ones- the counties, the municipalities and local banks) that have been involved in defining and supporting a development strategy

In the city of Linköping there is one of the major Sweden Universities, with more than 20,000 students, 32% attending to the course of engineering –the main specialisation of this Universtity.

Even if this University is relatively new, it has reached an international reputation in the field of Information Technologies.

The University has created three science and technology parks, where also business incubators are located, each with a prevalent specialisation in one high-tech sector (ICTs and electronics, medical equipment, multimedia).

One of these incubators, the one of Mjärdevi, is considered one of the fastest growing in Europe, with more than 150 companies and 5,000 employees.

Apart from the University and its research centres, the region benefited of a national project that resulted in the creation of a specialised centre: The Swedish System-On-A-Chip Design Centre (Socware), focused on microelectronics development. Socware is a national collaboration project for design of System on Chip (SoC = System on Chip) between universities, institutes and businesses.

Another research institute, Acreo, involved in the region's electronic sector development, has generated several successful spin-offs.

3. Characteristics and Process of Change

The emerging cluster of East Sweden is an interesting mix of Foreign Direct Investments, local "immaterial" resources and development of local small-medium sized innovative companies.

Some key investments, partially realised by Sweden high-tech companies, and the "aggressive" action of some local institutions (above all the University) have generated a conductive environment for the development of the electronic sector.

In East Sweden, there is now one of the Sweden's largest accumulation of electronics companies after Stockholm.

This sector is now composed by an integrated variety of specialised producers and research centres, which are active in the fields of:

- Electronics products,
- Software,
- Information and Communications Technologies (ICTs).

These specialisations share with other local sectors (the emerging life science technologies sector and the aerospace sector) an important common base of scientific and technological knowledge, skilled human resources and infrastructures.

East Sweden has developed expertise and has established research collaboration among leading companies and local institutes within sectors such as: signal processing, system-

on-chip design, high frequency electronic devices, semiconductor physics and thin films, polymer and paper electronics as well as electronics manufacturing and design.

Thanks to the presence of the University and of other research institutes, local companies benefit from a good availability of experienced labour-force, in particular as regards engineers with masters' degrees and PhDs, and also as regards qualified personnel with experience of electronics production.

Alongside with the companies specialised in the electronic products, the region has developed a good specialisation in the software sector. This sector is in East Sweden is by tradition very strong and it is estimated to maintain a high standard, thanks to a wide variety of companies within several niches and to the recent development of Internet companies.

Furthermore, two of the world top-10 companies within business systems were established in Linköping (i.e. Intentia and IFS). Both companies have carried out research and development activities in Linköping.

The third specialisation that forms the cluster in East Sweden is the Information and Communications Technology. This is one of Sweden's most successful sectors and it also is an important driving force in the East Sweden region.

This sector has a significant role for the other companies of the cluster as it creates a demand for competent subcontractors within for example electronics and software development.

Within the cluster, world leading telecommunication companies like Ericsson and Nokia are found, which both have research and development as well as production in the region.

These two large companies (even if only small-medium units are located in this region) have fostered the creation of local providers and small-medium companies operating in related sectors.

Once again, the competence assembled at Linköping University has a major significance to the development of the cluster. The Department of Computer and Information Science (IDA) is considered Sweden's largest computer research department, and has generated a number of successful spin-off companies. The University also offers one of the Sweden broadest educational programme in Information Technology.

A support for the spin-off companies and the start-up of new innovative enterprises has been offered through entrepreneur programs and three main incubators (the Mjärdevi Science Park –above mentioned- is the most important).

Incubators are integrated within the University, even if there also is a support from other local authorities.

4. Obstacles to Change

The limited capacity of an endogenous and spontaneous accumulation of knowledge, competencies and skills has been initially the main obstacle to the development of the cluster, stressing the need for focused local public policies in order to co-ordinate the evolution of the cluster, in turn leading to a huge public intervention oriented to favouring foreign direct investments inflows.

5. Risk Analysis

In the process of evolution of the cluster, the need for a strong support by the local authorities arose as a quite unexpected and yet key factor in the development of the cluster. In particular, the role of inward investments (both national and international) is very important. For this reason a regional development agency has been created in 1997 and focused its activity on the promotion of the area and on the attraction of investments. For the attraction of investments, the local authorities have adopted a

strategy based on: a) a strong focus on few key sectors, b) the promotion and valorisation of the local resources in line with the target sectors (such as the University and science and technology parks), the strong co-ordination among the local actors in order to define and offer a wide and integrated range of services and support both to local and to international companies.

6. Benefits of Change

The case shows the importance of the knowledge as fundamental resource for the development of electronic sector in particular, and of innovative dynamics in network-oriented organisations at large. The stress given on the University, its central role in several local initiatives (such as the incubators pr the collaboration with international companies) and its innovative organisation are among the successful factors of the cluster, favouring the development of a local labour market based on highly specialised and well trained and academically trained human resources, in turn improving the local knowledge system.

Conclusions

The approach applied by the local authorities shows the importance devoted to specific local resources such as: skilled labour-force, strong involvement of the research centres (through the University), interconnections among the local firms and between these firms and the multinational companies localised in the region.

Publication Details

Published by: Nomisma

Publication date: 2001

Journal: -

URL: -

Revised: -

Notes: -