Business Process Development and Information Technology in Small and Medium-sized Companies, COMPETE

Jörgen Andersson

IMIT WP: 1997_91
Datum: 1997.02.18
Antal sidor: 27

IMIT

Institute for Management of Innovation and Technology

Commission of the European Community
Esprit

Project Acronym and Number ***COMPETE 21865***
Project Start Date ***15 January 1996***
Consortium Members ***Nomisma (C), Aprei-Lerep (P), Imit (P)***

C O M P E T E

IMPROVING COMPETITIVENESS OF SMES THROUGH BUSINESS ENGINEERING AND TARGETED RESEARCH TECHNOLOGIES:
A METHODOLOGICAL APPROACH TO THE SETTING UP OF PILOT CASES IN THREE EUROPEAN COUNTRIES

Document Name *Swedish Local Context Report*
Document Author/s *Jörgen Andersson, Michael Eriksson, Birger*
Rapp, *Bengt Stymne, Claes Tunälv*
Issued by *Partner*
Workpackage/Task *WP 2.5*
File reference ***Swe+Ctxt.doc***
Circulation *2nd review meeting, Stockholm, 18 February 1997*

5. LINKÖPING

5.1. Economic dynamism

5.2. Availability of skilled labour

5.3. 3. Availability of Professional services

5.4. Presence of an Entrepreneurial Spirit and Climate

5.5. Presence of Regional Technology Advisors

5.6. Presence of Supporting Networks and Trade Associations

5.7. Availability of Public Support

5.8. *Availability of private capital*

5.9. Comparative advantages and disadvantages

5.10. Local specificity

1. The Swedish National System of Technology Transfer

1.1. Government Policy

From the end of the 19th century up to around 1965, Sweden enjoyed higher economic growth than any other country in the world. The development was partly driven by natural factor-endowments, partly the result of the expansion of large, export-oriented technology-based companies in the mechanical engineering sector. The Government's policy was to facilitate the industrial transformation processes through financial support to labour that wanted to move from stagnating to expansive areas.

Toward the end of the 1960:ies some of the traditional industries like mining, steel and ship-building began to get serious problems which developed into a fully fledged crises of the industrial structure toward the end of the 1970:ies. Government policy changed toward job-preservation through massive support to failing and state owned companies and to job-creation by granting subsidies and tax-breaks for investments in machinery and buildings.

Financial support has been given to inventors and for research but not for the commercialisation of products. The sums given for this kind of technological development has been relatively low in relation to other industrialised countries. However, the state has provided considerable support to the large Swedish industries as a buyer of advanced equipment: for hydro-electric and nuclear power from ASEA, telecommunication from Ericsson, air-planes from SAAB etc. However, idea that jobs could be created by giving support to develop knowledge and technical competence within small firms have had difficulties in being accepted by Swedish policy-makers.

A sizeable part of the Swedish industry disappeared during the recent economic crisis 1991-92. The cadre of people without a job increased from a few percent of the working population to around 15 percent. That economic shock has increased the interest of policy makers for measures that could increase the technological capacity also of SMEs.

NUTEK - The National Board for Industrial and Technical Development has been charged by the Government to administer the financial support for technology transfer. According the guidelines from the Government, NUTEK should create a system that gives SMEs and improved possibility to use technology for their business development. The technology trade should become more effective through the creation of net-works and from a greater transparency. Each entrepreneur should be able to get adequate advice where he can find the technology he needs.

An estimate of the financial support available to industry is around 2 GSEK (in 1997 1 SEK=8.60) of which 1/3 is ear-marked for small companies. The support can be broken down into the following categories:

1 Support to the establishment and development of industry .8 GSEK

1 Support to rural areas .5 GSEK

2 Programmes for SMEs .7 GSEK

2. NUTEK

During 1994-95, NUTEK channelled MSEK 63 into 18 different programmes in order to strengthen the competence and technical capability of SMEs. For example,in 1996 NUTEK was involved in the following types of activities.:

3 An instrument to evaluate the ability of hi-tech companies to develop new technology and the ability of SMEs to participate in EU-programmes like MINT.

4 Support to R&D (MSEK170) to consortia of companies in stagnating areas.

5 Support to three regional Swedish Innovation Relay Centers as part of the EU infrastructure for technology transfer.

6 TIPPS-Sefström (Technology Input in Products, Processes and Systems) units to be created at some new universities to provide advice SMEs on technical solutions to their problems.

7 Support to improve the capacity of national research institutes (there are 26 of these for different industries) to advice SMEs.

3. ALMI Business Partner

ALMI is the leading public organisation for providing financial support, commercial and technical advice to SMEs. It has its origin in local associations from the 1930ies for mutual support among business-men. Eventually the associations got co-opted by the central government as channels for financing business investments for regional development. ALMI is organised as a group with has 22 affiliates in the different Swedish provinces. As the capital available for ALMI to provide financing of business risks has gradually been decreased, their activities have become more and more geared toward providing advice and opening doors for companies that need help. They also arrange courses. The provincial ALMI-affiliates usually have a sizeable staff of its own (10 to 30 advisors). In addition, they work to a large extent through a network of consultants. Actually, ALMI is charged with the difficult and problematic task of providing direction for the development of the consulting business in Sweden.

ALMI is supposed to finance their activities by charging their clients. However, only a small fraction of the incomes come from client-fees. Instead they try to finance their activities through state grants, the EU structural funds, grants from the provincial government (länsstyrelser) and from organising and participating in various development projects.

4. Other National Level Operators

There is not enough room in this “thumb-nail sketch” of the Swedish National System for technology transfer to make a detailed description of the various actors. It should be pointed out that suppliers of equipment are by far the most important source of technology transfer. Also larger companies - for example Volvo - are important sources of technology (and business knowledge) transfer to smaller firms. Below some other main actors on the scene for technology transfer and business advice are listed:

8 Research institutes for 26 different industries;

9 Industrial contact secretaries in four technical universities;

10 16 technology parks;

11 11 holding companies for financing the commercialisation of patents;

12 7 companies for helping university researchers to patent their inventions;

13 7 Technology Bridge Foundations to finance projects that bring university researchers and business people together;

14 27 competence centres;

15 KK-stiftelsen for competence development (e.g. knowledge of IT in schools);

16 The Foundation for Strategic Research;

17 Innovation Center;

18 The Provincial Government;

19 The Local Governments and their Industry Secretaries (30% of all personal incomes are channelled as tax to the local government);

20 3 Innovation Relay Centers (linked to the EU-network);

21 15 Euro Info Centres;

22 STATT - The Swedish Technical Attachés

23 The Swedish Export Council

24 Private and quasi-public companies that provide venture capital and invest in the development of small business

2. Regions Selected

Labour market statistics in Sweden is based on labour market areas, i.e. areas that more people daily commute into than out from for work. A modified version of this division of the country had been found useful by a group researchers investigating the *Dynamics of Swedish Industry* (Davidsson et

Borås

Linköping

Åre

Borås

Linköping

Åre

insert map from file RKarta.doc

al). After discussions with the researchers responsible for that study, we found that the 83 regions they had defined could be grouped in 3 categories:

1. **Knowledge intensive regions** having a high proportion of university trained people in the work force. Such regions are often found around university centres and exhibit a high rate of establishment of firms in technical and business services.
2. **Small industry intensive regions** having a high proportion of the work-force employed in SMEs. These regions are often known for their entrepreneurial traditions and spirit and are sometimes found in rich agricultural areas.
3. **Resource weak regions** which have neither small companies nor highly skilled labour. They are found in areas where dominating industries like large steel-works have collapsed and in the forested and thinly populated inland of Sweden.

Firms in the Swedish COMPETE- project were selected so that they came from all three types of economic areas. However, each area proved too small for delivering all firms needed in the project from that type of area. We therefore had to select firms from the different areas all over the country. For the purpose of the present report, we have selected three local areas as examples of the different local contexts. They are:

Type of Local Context	**Name of the Region and its Constituent Municipalities**
Resource Weak Regions	Åre
Small Industry Intensive Regions	Borås (Borås, Tranemo, Svenljunga, Herrljunga, Ulricehamn)
Knowledge Intensive Regions	Linköping (Linköping, Ödeshög, Kinda, Boxholm, Åtvidaberg, Vadstena, Mjölby)

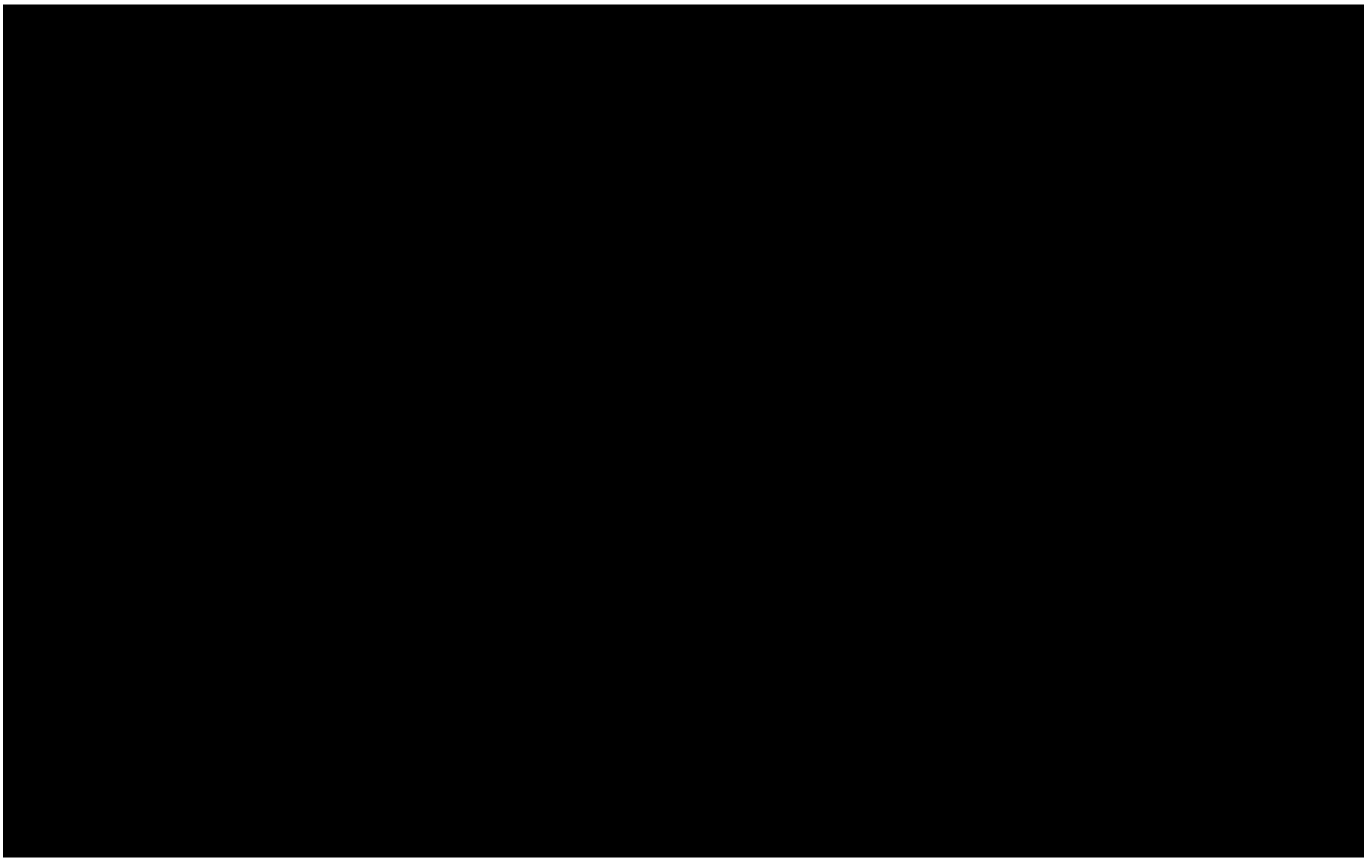
1. A Comparative Local Context Analysis

The table and diagram below compare the business climate of the three selected local areas in Sweden. Åre which is situated in the mountainous region of Jämtland in northern Sweden is a representative of the country's resource thin areas. Borås is situated in the inland of western Sweden and is a representative of a small manufacturing-intensive area. Linköping is a university town in eastern Sweden and together with its surrounding municipalities it is a representative of knowledge-intensive areas. The table and the diagram are based on figures provided by "Näringslivets favoritkommun" (Business-people's Favourite Municipality) which is produced by the "Veckans Affärer" (Ekelids, 1994). The data are fetched from official statistics and from national surveys carried out by SIFO (Swedish Institute for Opinion Polls). It can be noted that the business climate was considerable better in Linköping than in the other areas when the study was carried out. Actually, Linköping was appointed the best context for business in Sweden.

Table Indicators of Business Climate in Three Swedish Local Areas

[redacted]

Figure Business Climate Scores of Three Local Areas in Sweden



3. Åre

Åre is situated in a montainous area in the northwest of Sweden where it occupies an area about three times as large as Luxembourg (7,330 sq. Kms). However, its around 10,000 inhabitants contributes to a population density of only 1.4 person person per sq km. Åre is both a municipality and a labour market area. It is situated in the Province of Jämtland where Östersund is the site of the provincial government. The local government of Åre resides in the village of Järpen. Other larger places are Mörsil, Undersåker, Åre, Duved and Storlien. These and the municipality's other villages are situated along E14 which is the highway between Sundsvall in Sweden and Trondheim in Norway.

Public service is the largest employer with a share of 30% of the working population. The dominating industry is tourism which employs 25% of the working population and provides beds for 2 M tourist nights per yerar . Most important are alpine sports for which the village of Åre is Sweden's leading resort.

Manufacturing industry employs 10% of the working population of 4,000. Among the leading firms are Handöls Täljsten (makes soap-stone stoves), Nobex (saws), Norrmontage AB (electrical transformers), Lundhags Skomakarna (boots and skates - a COMPETE target-firm), and Peak-Performance AB (sport clothing).

3.1. Economic Dynamism

The population of Åre contracted during the 1970:ies but has started to expand again. Tourism provides a large cash flow. Firms like Peak Performance and Lundhags Skomakarna could use the trendy set of Åre tourists as a testing ground for fashion designs which they then can market in more populated areas.

3.2. Skilled Labour

The total labour force is limited due to the small size of the labour market. Experience from manufacturing is limited since only around 400 houndred people working in the manufacturing industry. Seventeen percent of the population has got a schooling beyond high-school compared to 22% for the country as a whole. As indicated by table 1, the supply of high-programmes is limited which makes the area less attractive for skilled labour.

However, it should be pointed out that Jämtland has attracted some people with higher education during recent years, e.g. people who want to move home and who work by means of telematics.

3.3. Professional services

Professional services can be found in Östersund which is a little more than an hours car or train drive away. Because of the positive image of Åre it may not be impossible to persuade consultants from further away to come and stay a few days. Actually, many professional people from the south own secondary homes in Åre.

3.4. Entrepreneurial Spirit

In the study cited in chapter 1, the business climate of Åre was judged to be below the national average. A certain entrepreneurial spirit has can be devind behind the industries that actually have come into being. Especially, the tourist industry rewards entrepreneurship and innovation. The provincial government has as its official policy to get rid of obstacles to entrepreneurship and is seeking contact with business people active in the area.

3.5. Regional and Technical Advisors

ALMI Business Partner in Östersund assists businesses in Åre. Few, however contact them for technical advice. Their typical client is a small mechanical workshop that needs economic help. ALMI carries out an analysis of the client and his project, perhaps with the help of a consultant. The services are provided free and if the analysis yields a positve answer, the client gets a soft loan.

IRC (Innovation Relay Center) Norrland is financed by NUTEK and the EU. Its purpose is to find technology that can match the needs of the firms in the area. They also help companies to market their technology on the European markets. They have made a telephone survey of the needs of the firms and found that these more often are of an economic rather than technical nature.

3.6. Supporting Networks

“Åre 2002” is a group for industrial development in which there is a cooperation between, the labour placement agency and industrial association. The group wants businesses to start communicating to learn to know each other and eventually to start trading with each other or forming partnerships and alliances. To facilitate communication a local electronic network has been established - “Åre on line”.

Also “Åre Business Academy” has been launched. It arranges a local industrial fair and seminars and courses on entrepreneurship, occupational skills, and business.

3.7. Public Support

The municipality receives massive support from the Central Government - around SEK 12,000 per inhabitant (to be compared with the SEK 18,000 that each citizen in Åre pays in local taxes). In addition, the Provincial government of Jämtland has been very successful in attracting grants for different projects in the area. Unfortunatly, the fight about hosting the Olympic Games was lost to Norwegian Lillehammer. At the moment, one of the more grandiose schemes promoted is the rapid “Atlantic” train line from Stockholm to Trondheim. Also development of IT and telecommunication are high on the priority list - e.g. there is talk about the Åre Valley as the “IT-Valley”. A creative use of information and telecommunications technology could compensate for the disadvantage of being a sparesly populated and somewhat isolated area.

Åre is classified by the Central Government as belonging to support areas 1 and 2. Therefore business in the region is entitled to a whole set of forms for support, for example from the Structural Funds, national funds, and Goal 6. Regional economic support is given for 50% of investments that leads to a net creation of jobs. For 1996 MSEK 5 was distributed to businesses in Åre.

Special subsidies can be given by the labour placement agency for people who want to start a business. Women that own businesses can get extra support. The Provincial Government can grant money for projects deemed to contribute to regional development. Among other sectors consultants get their social security contribution lowered from 30% to 20%.

The Norrland Foundation grant soft loans for technical and commercial development.

Goal 4 four grants money for competence development in smaller firms.

3.8. Private Capital

Given the rich supply of subsidies for business in the region, it is of course difficult for private capital to compete with risk capital.

3.9. Local Advantage

The disadvantages to being located in the Åre region may be more evident than the advantages: long distances to population centers, small population, and limited supply of labour, especially skilled labour.

3.10. Local specificity

The main asset of Åre is its nature, hotels, ski-lifts etc. These resources open up opportunities for business activities that have some type of connection to tourism and leisure. Development of activities in that area can benefit from research and master theses from the university in Östersund which specialises in tourism. Also, the financial support available is of value for firms who want to expand their activities in the region.

4. Borås

The municipality of Borås lies in the Sjuhäradsbygden region occupying an area of 5,172 km^2 in Western Sweden. The Borås region contains six municipalities: Bollebygd, Borås, Mark, Svenljunga, Tranemo and Ulricehamn. Though the region is famous for agriculture, together, Borås (including Sjuhäradsbygden) makes up one of the most industrialised regions in Sweden. The region's history has many similarities with the first industrialised cities in England, particularly the early on textiles and clothing, which was later supplemented by the manufacturing of machinery to supply this industry.

Borås has gradually developed into an industrialised town and the Sjuhärad district supplies it with both labour and raw materials. Several of Sweden's major clothing company are located in Borås. Up to the mid-1960s Borås and the Sjuhärad district continued to develop specialised labour in textile manufacturing, wholesaling and retailing trade, particularly in the clothing industry.

With its geographical location and its 100,000 inhabitants, the town of Borås is a regional centre for the Sjuhärad district (that holds 200,000 inhabitants in total). About 50% of the inhabitants of Borås belong to the work-force. A third are in industry and construction, a third in trade, communication and private service companies, and a third are employed in the public sector. There are no real giants among the companies in Borås, but there are a couple of dozen companies with between 200 and 500 employees. The majority of the 6,600 companies are relatively small.

One of the fastest growing companies in Borås is Ericsson Microwave Systems that manufactures radio links for telecommunications and employs over 1000 people. In addition there are several other larger manufacturing companies are located in the region. These large firms do not seem to generate work in small- and medium sized firms. Instead, most of the smaller manufacturing companies are either manufacturing parts and products for companies outside the region, or directly to the final customer.

Borås is a strategically located junction for transportation, with several main roads crossing, railroad and 40 km to the Landvetter Airport. Due to the numerous mail-order and trade companies, there are several major transportation firms located in the area.

The newly established University of Borås (1977), with its 3,500 students (about 2,000 full-time courses) is reinforcing Borås' and the region's development. The university has departments for Library and Information, Computer Science and Business Administration, Education Engineering Sciences, Textile and Clothing, and a University Library.

4.1. Economic dynamism

During the 1970's direct employment in the clothing industry gradually fell and was replaced by an upsurge in other industries. New industries moving into the region contributed to this development. In recent years employment has increased in companies linked to the clothing industry.

This sector still accounts for 35-55% of the total number of people employed in industry in the municipal areas in the region.

In the table below, the proportion of work-force employed in different sectors, 1993 is shown (Älvsborg County Council).

Industrial sector	Region	County
Manufacturing sectors	*32%*	*32%*
Agriculture and forestry	2.5 %	2.5%
Engineering industry	7.3%	8.4%
Forest products-based industry	2,6%	2,6%
Textile and clothing	9,7%	0,7%
Other manufacturing	3.7%	8.0%
Construction industry	6.1%	5.8%
Service sector	*68%*	*72%*
Transport, mail, telecomm..	5.3%	6,9%
Commerce	15.1%	11.4%
Tax-based services	32.8%	34.5%
Other services	14.7%	19.2%

Among the 286 municipalities of Sweden, Borås obtains a rating of 68 (national average=index 100) in terms of value added/inhabitant for 1990. Since Borås has index as 103rd as for growth in value added /inhabitant 1985-1990, the municipality as a whole lag behind other municipalities.

The population of the Sjuhärad district has grown slightly more than the country as a whole for the last 25 years; 11% in comparison to 8% for Sweden as a whole. During the five-year period from 1990-1994, the region had a positive net inward movement of 405 persons on average. Borås has the greatest net inward movement 324 persons.

4.2. Availability of skilled labour

The educational level of the inhabitants in Borås is lower than the national average, though Borås has the highest educational level in comparison to all the municipalities of the Sjuhärad district (se table below).

	Secondary upper school	University degree (less than 3 years)	University degree (at least 3 years)
Borås	25,6	9,1	6,5

Ulricehamn	21,0	7,2	5,7
Mark	19,7	6,9	5,5
Tranemo	16,7	6,0	4,0
Svenljunga	15,0	4,8	4,2
Sweden	30,3	9,3	9,4

However, Borås has a good position in terms of commuting. Studies of Borås availability of people with higher education is not that bad. However, the time-distance to Göteborg is still too long for a larger number of well-educated people from Göteborg to travel to Borås on a daily schedule. The municipality of Borås is therefore working hard to get the plans on building a high-speed railway to Göteborg and Stockholm fulfilled. A journey from the Central-station of Göteborg to Borås would then be 17 minutes.

The 1996 OECD Study of Borås points out that there is a ”wide-spread condescending attitude to formal education” (Andersson & Henning 1996). That information is not, however, supported by recent studies of young peoples attitude towards education. On the question about younger men’s dream-job in Borås, engineer/MSc (25%) is ranked the highest. Other highly ranked technical positions/jobs are computer engineers (14%) and researchers (13%) (Andersson & Johansson 1995). A possible explanation is that there is a tendency towards higher education in Borås, where the recently established university of Borås is contributing to the changes in attitude to higher education.

4.3. Availability of Professional Services

Borås is well furnished with consultant services of different kinds, a fact supported by comparisons of other communities in Sweden (Veckans Affärer, 1993). There are local consultant firms within most areas of management, marketing, administration and technical support (se Appendix).

Also in the area of computers and computer systems and administration, Borås is well supported by professional companies, due to the regions sign of being an area of trade and imports/exports and service. There are more than 40 companies working in the fields of consultant, service and maintenance, and education. A large number of firms selling hardware and software are also located in Borås. For example, IBM has one of their largest consultant and hardware/software outlets in Western Sweden located in Borås.

4.4. Presence of an Entrepreneurial Spirit and Climate

The Sjuhärad district, and specifically Borås, is well known in Sweden as being a centre for commerce and trade. It has its roots back to the peddlers, the ”knallarna”, that became familiar figures throughout the land as they made their way from the Sjuhärad district with their products, travelling the length and breadth of Sweden. The peddlers laid the foundation for many of the major commercial enterprises in the region.

The conditions for starting a business, especially a textile business, have always been good, at least in the terms of people's values and pattern of thinking (County Council of Älvsborg, 1996). The region has very little of the ”mill mentality” that to a certain extent has paralysed other areas of the country. A recent study of Borås, in terms of its future potential, shows that a remarkably great amount of Borås' youngsters can imagine themselves starting an own business — 82 percent of the men and 67 percent of the women (Andersson and Johansson 1995).

The same study shows that the younger generation favours work within the mechanical industry, to a larger extent than the traditional industries of Borås (textile and mail-order industry), indicating that there might be a growing foundation for an increased industrialisation of the region.

4.5. Presence of Regional Technology Advisors

There are several organisations and projects available to the companies in Borås, aiming at providing them with both information and action in the areas of technology, market/export and business development. The Municipality of Borås has a *Public Trade and Industry Unit* (http://www.bk.boras.se/klk/nu/index.htm), that serves as a hub for guiding companies to projects and associations in the region. I.e. a company that need support of some kind, often turns to this unit first, and then get guided to another organisation such a technology advising organisation, a municipality or private development project, and so forth.

The Foundation for Technology Development in the Sjuhärad district, University of Borås

One important technology advising organisations in the Borås district is STIS (The Foundation for Technology Development in the Sjuhärad district) (http://www2.hb.se/vb/stis/meny.htm). STIS' aim is to develop, and to spread knowledge about the industrial and technical competence in the Sjuhärad district. It support companies and organisations in building company networks, transfer technologies, and educates. To get benefit from the foundation, the companies pay a yearly member fee (about 400 ECU for a company with less than 50 employees). The foundations head-quarter is located at the regional university — the University of Borås. Hence, one of STIS' ideas is to spread the technologies and competencies developed at the university. But most of the technology transfer activities probably comes from other companies in the company networks that STIS maintain.

The Swedish National Testing and Research Institute (SP)

SP is a national Institute for testing and research within the fields of e.g. mechanics, materials technology, Physics and electronics, building technology, fire technology, energy technology and chemical analysis (http://www.sp.se). Furthermore SP certifies company's quality systems (ISO 9000), environmental management systems or products, and make sure they fulfil the requirements that the market impose. The institute is a Notified Body, which means that certifications performed by SP entitle manufacturers to use the CE and other symbols, with resulting access to the European market. SP's main office is located in Borås, and it employs about 450 persons.

SP is working closely with large and small companies, universities, institutes of technology and other organisations, and with a international network of contacts, contribute to industrial development, safety of products/production and technical development of society. SP has a staff of 500 employees. Though SP is a national institute, the fact that it is located in Borås, makes it an important source for technology competence and knowledge at the local level.

Access to advisors operating at a regional level
At the regional level there are several organisations available in the field of technology transfer, most of them located in Göteborg. Among the organisations are the EU-funded Innovation Relay Centre (IRC), The Swedish Institute of Production Research Engineering (IVF), Chalmers University of Technology, The Technology Bridge Foundation in Göteborg and ALMI.

Innovation Relay Centre

There are three Innovation Relay Centres in Sweden; one located in Göteborg with offices at IVF and at Chalmers University of Technology. The Innovation Relay Centres are a network of (technology) transfer centres assisting companies, particularly small and medium sized enterprises, willing to absorb new technologies. The IRCs are a service for the transfer of research results and technologies to industry and for assistance for participating in Community RTD programs. The goal is to improve competitiveness in local industry. Advice in innovation, technology transfer and exploitation of research results.

IRC map the needs for science and technology in the local industry and actively disseminate information and promote exploitation of research results and technology transfer in correspondence with the needs of the companies. Furthermore IRC assist in identifying partners through the IRC network, for exploitation of research results and technology transfer and provide information about the possibilities of financial support for promoting exploitation of results and technology transfer, from Sweden and the EC.

The Swedish Institute of Production Research Engineering (IVF)

IVF is the Swedish engineering industry's industrial research institute (http://www.ivf.se). Working with engineering companies and suppliers, e.g. software companies, equipment and materials suppliers, they conduct research and other activities intended to reinforce the sector and improve the competitiveness of individual companies. IVF works at all levels. They operate projects in a large number technology areas: e.g. work with companies to develop new technologies and new applications, and involved in the dissemination of technology and the establishment of operating systems and methods. Their overall objective is to ”create the right conditions for growth and good working conditions”. IVF's activities are based on the human resource of its highly skilled and qualified personnel. IVF’s main office is located in Göteborg, about 60 km from Borås, and of its over 200 staff, more than 160 are university graduates, mainly in the field of engineering.

Except from the ”normal” consultancy projects, IVF offers SME’s in the engineering industry 2 days of telephone support, or a physical visit, at no charge. Projects from 15-90 hours are charged at 70% of the normal cost. The projects should be in the areas of production technology or work environment. In total, IVF claims to have been involved in over 3000 projects.

Chalmers University of Technology

Chalmers University of Technology (CTH), situated 60 km from Borås, is a notable potential to many small- and medium sized companies in the Western part of Sweden (http://www.chalmers.se/HyperText/Industri/EngSam/collabind.html). Historically, CTH has mainly been involved in projects in the larger companies in the region (Volvo, SKF, Ericsson etc.), but the new *Industrial Liaison and Development Office* is emphasising the collaboration with, and technology transfer to small- and medium-sized enterprises. Also Chalmers research departments offers a limited support at no charge to SME’s. Furthermore, CTH is one of five partners within the Innovation

Relay Centre (IRS) for Western and Southern Sweden. The Industrial Liaison and Development office has produced an on-line catalogue (http://www.chalmers.se/HyperText/Forskning-S.html) as well as a paper-back catalogue that is forwarded at no charge to companies in Sweden. One of the companies in the Compete-project from Borås, has actually started a production development project together with a department at Chalmers the fall 1996 after browsing this catalogue.

Jönköping University

Jönköping University is a regional university, located about 80 km east of Borås (http://www.hj.se/hijen.html) . The university holds about 3500 whole year students, and is divided into three areas: School of Engineering, School of Education and Communication, and the International Business School. Though the university is newly founded, the International Business School (JBS) has gained great interest both nationally and internationally (http://www.hj.se/jibs/). JBS is specialised in e.g. Entrepreneurship, European Business, Management, Service Management, Informatics and Commercial Law. Both education and research is focused on the needs of future companies; especially small and medium sized enterprises - SMEs - in Sweden and throughout Europe. Its location in Jönköping is natural due to high concentration of SME's with international contracts in that part of Sweden. Of special interest for the Compete project is the focus on SME's also in the field of Informatics, where they use a model which we have specially developed for these companies, helping them to state the right requirements on modern IT.

The Technology Bridge Foundation

There are seven Technology Bridge Foundations in Sweden, where the closes to Borås is the foundation in Göteborg. These foundations have the aim to increase the knowledge transfer and the co-operation between the research community and small- and medium sized companies. The foundations are working independently from each other, and have different strategies to fulfil their goals. The foundation in Göteborg focus 1) the commercialisation of research results from the universities, and 2) Support and builds networks for co-operation between the research community and SME's.

4.6. Presence of Supporting Networks and Trade Associations

There are several organisations in Borås that support small- and medium sized enterprises. Among the most important private associations for business and industry are: *Företagarna i Borås* — A national organisation for small- and medium sized companies, with regional offices in most municipalities in Sweden. The Borås branch has about 600 member companies, and supports the member companies primarily with legal and financial advise. *Borås Merchant Association* — an association with 230 member companies in Borås, primarily promoting the interests of retail shops in Borås. *PROTEKO* is a special centre for the textile and clothing industry, focusing on production and technical solutions. It provides demonstration facilities, training and development of new technology for manufacturers in the textile and clothing industry. *The Swedish Institute for Fibre and Polymer Research* (IFP) shares the same premises. *The Swedish Mail-Order Associations* (SMOA) head office —

with its 40 corporate members, SMOA is a major player in influencing the mail-order business and their interests and organisation. Other local private organisations are: *West Sweden's Textile Association, The Freight-forwarding association*, and *Borås Local Road Haulage Operators*.

In addition to these associations, there are several networks and projects aiming at developing the district as well as individual companies. Here are a few examples:

25 *West Sweden Traders* is a co-operation between all 70 municipalities in western Sweden, set up in order to superintend the EU developments and to market the region.

26 *The network 46/33* is a co-operation between the City of Borås, local and cultural institutions, and it aims at marketing the region.

Borås Full Fart 96 is a co-operation between the City of Borås, the Network 46/33, The University of Borås, The Labour Exchange in Borås, and Telia. The purpose is to stimulate the use of Information Technology in Borås, and to connect companies and organisations to each other. The project started in the summer 1996, and in January 1997 over 562 companies are connected. All companies receives a home-page, an e-mail address, News, possibility to browse the net etc. (see: http://www.plus4633.boras.se/ and http://www.boras.se/ffb96.htm).

7. Availability of Public Support

There are several possibilities for limited financial support from the public. *The Department for Regional Development* at The County Council of Älvsborg offers *temporary small business support, consultancy cheques*, and *investment subsidies*. A common prerequisite for these three supports is that the it should lead to generation of new jobs.

The local EU Program office at The County Council of Älvsborg also supplies competence cheques from the *Objective 4* (EU Social Fund), for projects aiming at increasing employers competence and supporting organisational renewal.

ALMI is a group comprised of 22 regional development companies and a group head quarters in Stockholm. They promote strategic business development of small and medium sized businesses (SMEs) and help in the establishment of new businesses. ALMI West has 5 offices; one of them in Borås. The support is directed towards firms with an expanding potential larger than the local market. Except from initial analyses of technological and financial requirements (based on company strategy), ALMI may give beneficial loans.

8. Availability of private capital

According to the *Public Trade and Industry Unit* at the Municipality of Borås, there are very few possibilities to get private venture capital. The Public Trade and Industry Unit direct companies either to the public funds (see above) or to the banks for normal bank loans. The national venture capital firms have no local office in Borås.

9. Comparative advantages and disadvantages and Local specificity

Historically, Borås is renowned for its high concentration of textile firms and trading and mail-order businesses. The mail-order businesses are to a large extent based on imports, and therefore the value-added is fairly low. It is in the latest few years that manufacturing companies have localised in Borås and its surroundings. Companies such as Ericsson Microwave Systems and Mont Blanc Industries have growth tremendously the latest few years. According to the *Public Trade and Industry Unit* of Borås, this has not resulted in any notable increase of supplying firms.

A rough conclusion from this would be that there is no tradition of starting/running manufacturing firms in the area, especially in the high-tech branches of industry. One factor that may contribute to this is the comparative low level of education in Borås. Only 25,6 % of the population has at least three years of education in upper secondary school (30,3% for all Sweden) and 6.5% has at least three years at university (9,4% for all Sweden). The neighbouring municipalities in the Sjuhärad District have even lower figures when it comes to education.

There are several factors working for a higher portion of manufacturing firms in Borås and its surroundings. The fact that the larger manufacturing firms are growing at a high speed will, at least on the long term, increase the need for local suppliers of various products and services. The Borås Municipality tries to enhance this process through different kinds of establishing support. One non-conventional project is to get U.S. supplying firms to establish around the larger manufacturers in Borås.

An investigation of young peoples expectations of their future working life in Borås indicates that there is a ground for the starting of new enterprises, specifically in the manufacturing area. 82 percent of all young men, and 67 percent of all women, could consider starting an own enterprise. As many as 61% of the men say they could consider working in the engineering industry, while only 23% of them could consider working at the major mail-order company (Ellos) (see Andersson & Johansson, 1995).

However, the study of the renewal of West Sweden’s regions (Andersson & Johansson, 1995) suggest that Borås’ near future probably lies in the service industry; except from the progress of the traditional industries in Borås (mail-order, textile, trading etc.) - probably with the help of modern information technology, e.g., into electronic commerce - companies supporting the established companies with telecommunications, information technology and the basic services, such as hotels, restaurants, travels and conferences etc.

Appendix Borås

Number of Consultancy firms (1995)

Administrative consultancy and services	7
Documentation and information services	1
Management consultancy firms	14
Computer consultancy firms	24
Financial advisory firms	12
Industrial design	6
Engineering firms - Electromechanical	9
Engineering firms - Mechanical	11
Market/marketing consultancy	5
Bookkeeping firms	43
Accountancy firms	15
Advertising	50+
Telecommunication	1

5. Linköping

In 1996 Linköping had about 132.000 inhabitants and it is the fifth town in Sweden. Within half an hour's drive east another large town Norrköping is situated with about 123.000 inhabitants. The seat of Östergötland is situated in Linköping castle. The town has a medieval cathedral with a dean and another closely situated church of medieval origin, Saint Lars church. The number of inhabitants has increased since 1950. The trade and industry are similar to the whole country in average. However the number of employees in manufacturing industry is 24% compared with 19,5% in the whole country. The trade is 10% (11,5%) and the private services are 14% (17%).

The riches provided from the region surrounded Linköping, including iron ore and timber, have been processed and shipped out to the rest of the world from Norrköping's port for centuries.

The flat land of Östergötland is one of the best agricultural districts in Sweden although it covers only 3% of the total number of jobs in Östergötland. Östergötland has good transport facilities. The highway to Stockholm and to the south of Sweden is passing (E4). It began with smelters to produce cannons and materiel for the navies of Europe in the 17 century, and continues today with to of the world's most sophisticated paper mills at Holmens Paper. So is the railway with the new fast train X2000. It takes less than two hours to Stockholm and about four hours to Malmö. Both Linköping and Norrköping have airports with both national and international flights. There are also good connections with other parts of Sweden.

The region of Linköping is an old district and you can find many interesting examples of Swedish culture and traditions. It is a center of Swedish monasteries and here the first nunnery of the Saint Birgitta sisters was founded. In Linköping the origin of the city planning between the cathedral and Saint Lars church is medieval.

Today the cultural also offer symphony orchestras and two permanent world class theatres.

In the survey mentioned earlier Linköping was (1993) voted as the "best in Sweden" when it comes to doing business. No other city in Sweden had a better or more educated labour market. And in terms of R&D opportunities, Linköping was matched only by Stockholm.

In this study some municipalities close to Linköping are regarded as the region of Linköping. In the list below we can se the number of daily net commuters to the municipalities outside. For instance, the commuters from Linköping to Motala are 562 and from Motala to Linköping 1596. The net is 1030 (1596-562). Those communes that get a negative sign below, have more commuters leaving Linköping than vice versa. These communes are not considered to belong to the Linköping region.

Motala	1030
Vadstena	77
Mjölby	1438

Boxholm	61
Kinda	656
Åtvidaberg	1111
Söderköping	130
Norrköping	-60
Finspång	-6

Figure 1 The number of commuters _to_ Linköping

The different municipalities inside the Linköping region have been rated for business climate in the same investigation that was cited above. The total score for business climate varies from 3,88 (Linköping) to 2,35 (Ödeshög). The added value for each of the 6,000 inhabitants of Ödeshög's was only 63 on an index for which the national average is 100. The figures and observations below are valid only for the regions center, i.e. the Linköping municipality.

Linköping has many companies and a medium sized university. Closed to the University in Linköping a Science Park is situated. In 1993 Compared with the average figures of Sweden the unemployment is about 2 % less in Linköping. In average the number of inhabitants/1000 m^2 is 92. The average temperature is 6,4C. In July it is in average a little less than 20C, and in December it is in average a little less than 0C. The rain is in average 500 mm/year. The number of inhabitants in Linköping compared with the rest of Sweden is growing about 15% faster. The number of inhabitants per 5 years of age is shown in appendix.

The presence of students explains partly the domination of age-classes 20-29 and the lower average income. Linköping has about the same number of both sexes.

The largest employers are the commune (8166), the SAAB (7156), University hospital (4871) and the University (2550).

Indicators Supporting the local Context Analysis.

5.1. Economic dynamism

Economic growth. Since 1990 the average income growth per year has increased from 1,2% to 2,6%.

Population growth. Since 1960 the population has increased about 40% which means a little less than 1%/year.

Growth in labour force - yes (details will follow)

Unemployment about 8% (including those in public activities). It is decreasing. It is about 2 % lower than average in Sweden.

Growth in per capita income Yes

5.2. Availability of skilled labour

Craft men/Skilled labour,	good
Technicians/engineers	good

Higher professional education, good, 24,67 % of total labour

5.3. 3. Availability of Professional services

Consultants	60,8/10,000 working
Soft-ware houses,	110

The last three years a computer company has been awarded ”Best Swedish computer company”.

IT-vendors, good

5.4. Presence of an Entrepreneurial Spirit and Climate

BKP is 107 and the change between 1985 and 1990 is 73.000

Tradition Values, attitude surveys. Linköping has a long tradition of manufacturing and trade. The business climate is good. According to the reported investigation Linköping got 3,83 points including insurance (total premiums 2883), sales in retail trade index, 100 (average in Sweden is 100), day-care (56) in number of children (3 to 6 years old) there to total number in the commune, culture (2%) measured as number of employees in the culture sector in percentage, new, newspapers (13) measured as number of newspapers per week published in Linköping and lifetime, as average lifetime for both men and women (75,7).

5.5. Presence of Regional Technology Advisors

Being the fourth region in Sweden, it is not surprising to find everything that you can find in Stockholm, Gothenburg or Malmö.

In general

For different industries	good
Access to advisors operating a national level,	good

5.6. Presence of Supporting Networks and Trade Associations

Being the fourth region in Sweden, it is not surprising to find everything that you can find in Stockholm, Gothenburg or Malmö.

Associations	yes
Clubs	yes
Networks	yes
National	yes
Local	yes

5.7. Availability of Public Support

27 It seems to be of minor importance in this region

Financial support	Not specific for the region
Regional development funds	Yes
Tax breaks	No

280

Investment subsidies	No
Transport and other	No

8. *Availability of private capital*

At least one bank have now started to try to connect the capital owner directly with the company.

Venture capital	Yes

Bank engaged in small business financing Östgötabanken, is a bank often associated with active interest in supporting the local business activities.

9. Comparative advantages and disadvantages

In the marketing of the region they claim that it has it advantages like larger cities by the availability of all kinds of resources and support, and the advantages of small cities with no traffic jams, close to the nature and culture.

10. Local specificity

I. The region is Sweden in miniature, but a little better according to the politicians.