

RÉSEAU EUROPÉEN POUR LA GESTION DES
CONNAISSANCES AU NIVEAU RÉGIONAL



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THE TAMPERE REGION MONOGRAPH



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TABLE OF CONTENTS

1. BRIEF REGIONAL DESCRIPTION	3
2. REGIONAL SOCIO-ECONOMIC PROFILE.....	5
2.1 The industrial heritage.....	5
3. SCIENCE, TECHNOLOGY AND INNOVATION, REGIONAL STRATEGY	11
4. DESCRIPTION OF KNOWLEDGE DOMAINS, AGENTS AND INTERACTIONS.....	16
5. REGIONAL SWOT ANALYSIS	29
STRENGTHS	29
OPPORTUNITIES	29
WEAKNESSES	29
THREATS	29
6. CONCLUSIONS	30
BIBLIOGRAPHY	32

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The Tampere Region (Pirkanmaa)

1. BRIEF REGIONAL DESCRIPTION

The Tampere Region is the second largest region in Finland. It is a modern concentration of industry, commerce, services and education. The region provides its residents attractive living conditions in an environment that combines the centrally located towns with clean nature and rural landscapes close at hand.



Map 1. Europe, Finland and the Tampere Region (Source: The Council of Tampere Region 2004)

1.1 Facts and figures

The city of Tampere is in the heart of the Tampere Region. It was established in 1779. It is located ca. 180 kilometres, two hours, north-west from the Finnish capital, Helsinki. Tampere is the biggest city outside the Helsinki Region and also the biggest inland city in the Nordic countries. The 33 municipalities in the Tampere Region form six sub regions, including the Tampere Central Region as well as Southern, South-western, North-western, Northern and South-eastern Tampere Regions. The total area of the Tampere Region is ca. 14300 km². The total population in the Tampere Region was 458900 people in the year 2004. Some 200000 of the region's inhabitants live in the City of Tampere, while the number of people living in the region's smallest municipality, Kuhmalampi is 1100.



Map 2. The Tampere Region's 33 municipalities (Source: The Council of Tampere Region 2004)

The economic outlook (see the figure 1) in the Tampere Region is positive. The growth can be seen e.g. in terms of better employment. Working population in the Tampere Region was over 210000 people in the end of the year 2004 and there has been a slight decrease in the unemployment rate which was 11, 1 % (in the end of August 2005).



Figure 1. (Source: The economy in the Tampere Region 2005)

The economic activity (see the figure 2) in the Tampere Region is based on private and public services and manufacturing, while construction and primary production play a minor role. The Tampere Region has traditionally been the industrial heart of Finland, dating back to the 19th century. The industry base in the region is quite diverse, including textiles, paper, rubber, medical equipment, media, machinery and telecommunications.

JOB^S in the Tampere Region 31.12.2003

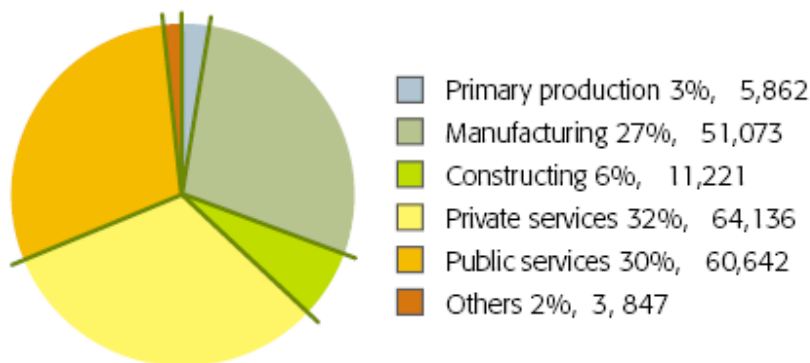


Figure 2. Work force by occupation (Source: The economy in the Tampere Region 2005)

During the past 30 years the local economy has experienced a profound structural change as have many other industrial regions across Europe. The proportion of industrial workers has dropped from over 50% in 1970 to a little over 30% in 2000. Although, when taking into account the outsourcing of various industrial services and the change in the nature of jobs it is clear that industry is still a very strong sector in the Tampere Region. A considerable number of new service jobs have been created in the public sector as a result of the developing welfare state. As a whole, the fastest growth areas in the region are both private and public services.

The diversity of enterprise structure and the amount of investments that the region's companies make in R&D, are what make the Tampere Region an attractive prospect for the location of new enterprises. Many of the companies located here are operating on a global scale. The region has a number of global market leaders such as John Deere Forestry, Metso and Kalmar in the field of machinery and automation, firms whose success is grounded in R&D driven technological superiority and the ability for constant development.

2. REGIONAL SOCIO-ECONOMIC PROFILE

2.1 The industrial heritage

The first industrialised city and region in Finland

The Tammerkoski rapids that run through the heart of the region - the City of Tampere - provided a new source of energy for the industrialization that emerged towards the end of the 18th century, resulting in the establishment of a new town in 1779. Since then the Tampere Region has been a forerunner in applying new technologies, which is well demonstrated by the achievements already during the 1800's. These items also provide a window to the early industrial development of the region.

- Finland's first paper mill started operation in 1783
- 1821 the first textile factory in Finland
- 1842 the first paper machine in Finland
- 1875 the first shoe factory in Finland
- 1878 the 2nd phone connection in the Finland

- 1882 the first electric light (Edison generator number 3) in the Northern Europe
- 1888 the first street lights (30 arc lamps) in the Northern Europe

Followed by further rapid expansion the City of Tampere was the largest industrial city in Finland by the beginning of the 20th century.

World War II promoting the development

The rise of heavy metal industry in the Tampere Region and especially mechanical engineering can be traced back to the period before the World War II. The introduction of the state airplane factory in 1931 was one of the factors that increased the need for engineering industry. This factory moved to Tampere in 1936. By 1943, largely fuelled by the manufacturing of weapons, airplanes, vehicles and components for World War II, the metal industry was the biggest industrial sector with nearly 27% of the workforce. The textile, clothing, footwear and leather industries were also a strong branch after World War II and in 1956 those industries employed 18000 people. Since then, employment in the textile and related industries has fallen dramatically, and in 2000 it was only 2900.

After the war, a substantial share of Finland's industrial infrastructure was devoted to paying war reparations to the Soviet Union. Tampere was the production centre of metal products and machines, boosting the development of machinery manufacturing and related fields of expertise in the city region. It can be regarded that the technical, production, and design skills of local engineers and technicians, in machinery in particular, were enhanced by the need to innovate and produce the machines demanded as reparations by the Soviet Union, which often were not previously manufactured at all in Tampere.

There was also a shortage of all kinds of products in the country and new machinery had to be built to start new production of both industrial and consumer products. Later, as many of the companies continued to sell the same machines to the Soviet Union that were previously provided as war reparations and in that sense, new markets were opened. The Soviet Union was the main market for Finnish machinery exports up until the Soviet collapse in 1989.

From industry to service

The nature of work has changed tremendously in the region since the 1970's. The employment base of the region has changed more as a result of intra-industry changes than because of a structural change towards a service economy. A good example is the nearly 4000 jobs at Nokia Corporation none of which are in production – all are in R&D – but are still counted as industrial jobs. The industrial activities have become more knowledge intensive and dependent on global marketing and service networks. The region has been voted the most attractive region in the country several years in a row, which has corroborated to the growth and the positive flow of people into the region.

The region's industrial structure is dominated by small and medium sized enterprises (SME's). There are some 26000 firms of which some 21000 employ less than 10 people and can thus be considered micro firms. Only about 40 companies employ more than 250 people and half of those employ more than 500 people. Thus most of the region's firms are small and medium size companies. Of these companies, some 13% are industrial firms, another 12% operate in construction while the largest majority or some 22% are in trade. About 5% of the firms are in the tourism industry.

The industrial sector employs some 50000 people in the region, or about 11% of the national industrial workforce. The industrial sector employs about a quarter of the region's workforce the total number of jobs in the region being about 195000. The structure of the region's economic scene has changed much in the past 15 years. During 1990-1995 as the region went through the most severe recession since World War II, the region lost 10000 jobs both in private services and industry, while it maintained the number of jobs in public services. In the past decade (until 2003), the region gained 14000 new jobs in the private services and about 10000 jobs in public services, or about a 30% and 20% increases respectively. In the same time period, the industrial sector gained only about 5000 new jobs or a 10% increase. This trend seems to continue. The region has about 11 high tech firms and about 200 knowledge intensive technology service firms per 100 000 inhabitants while the national respective averages are 10 and 170.

The largest employer in the region is the Nokia Corporation with some 4000 employees. It should be noted that Nokia has no production facilities in the region but all people work in the various aspects of R&D. The second and third largest employers are two paper mills UPM Kymmene and Metsäliitto group. Nine firms employ more than 1 000 people. In terms of exports,

the region is responsible for more than 25% of the national exports in such areas as rubber (e.g. Nokian Tyres and Teknikum), leather (mini cluster of leather articles in the South-Western Tampere Region) and textile (e.g. Tamfelt and Nanso) industries.

The unemployment rate was 11,1% in 2005 while the national average was 11,3%. Of those, 12,3% were under the age of 25, which is the same as the national average.

Building on top expertise

The Tampere region could be defined by an “8”. It produces slightly over 8% of the national value added of the GDP of 140 billion € as well as of the national tax earnings. These are all somewhat below the national average as the wealth is accumulated in the capital region.

What the number “8” does **not** define, is the innovation activities in the region. The R&D activity of firms in the region is 17% of the national activity. The R&D activity in general in the region is more than twice the national average. When divided per capita, the Tampere Region invests some 1700€ per capita in R&D while the nationwide figure is 1000€ per capita. As it is allowed for national governments to subsidise R&D activities, one good measure to look at the R&D activity is to look at the funding for R&D from public funding sources. The Tampere Region received about 11% or 237 million € of the National Technology Agency Tekes overall funding. The universities in the region receive about 11% of the basic research funding granted by the Academy of Finland and some 16% of the applied research funding from the National Technology Agency Tekes. In absolute figures, the firms in the region spend about 200 million € in R&D while the public research organisations and universities spend about 500 million €.

When looking at the educational level of the region, there are about 40000 students (cf. population of 460000). More than 62% of the population (15 years of age and older) hold a degree either from a tertiary educational institution (38%) or from a university or a polytechnic (24%), both higher than the national average. Of those who have received a degree, over 50% are women. About 4400 new students start their studies annually at region’s universities (about 2400) or polytechnics (2000). The total number of enrolled students is about 40 000 of which about 2000 are of foreign origin.

The Tampere Region has two universities, three polytechnics, dozens of schools, colleges and research institutes. The University of Tampere is a multidisciplinary academic community characteristically undertaking a wide range of advanced research and teaching focused on social sciences and its economics, administration and humanities. It also has a medical school. The university has been named a quality institution for adult education, and its Medical School research unit for Mitochondrial Biogenesis and Mitochondrial Diseases (FinMIT) has been selected as a Centre of Excellence by the Academy of Finland and the Ministry of Education for the period 2002-2007.

The work of Tampere University of Technology is grounded in extensive basic research in technology, on which it has been possible to build up a structure comprising education, applied research and innovative product development. New fields emerging at the present time include brain research and intelligent machines, biomaterials, wireless multimedia equipment, nanophotonics, optical lasers for a variety of applications, remote and virtual operation, electromagnetic imaging applications and free piston engine technology. The University of Technology had three centres of excellence in 2000 – 2005, nominated by the Academy of Finland: the Biomaterials Research Group, the Department of Hydraulics and Automation and the Signal Processing Research Group, which was also appointed for the present period 2006 - 2011. In general, the Tampere University of Technology has extraordinary good cooperation with local, national and international enterprises and research units.

In addition, there are over 40 intermediate-level educational establishments, including 38 upper secondary schools (some with specializations such as verbal expression, communication, fine art, sport, international baccalaureate). There is also a dedicated school for the Swedish-speaking minority, providing instruction from the junior to the upper secondary level. In Tampere is also located Finland's only police college, which will be transformed in to polytechnic in the autumn 2006.

From 1960 onwards, the University of Tampere and the Tampere University of Technology have been supporting the region's industrial development by educating qualified workforce and co-operating with the industry in research. However, in the end of 1970's the recession and the progressive unemployment rate led the City of Tampere and the industrial corporations in the region to the conclusion that actions were needed to improve the general situation. Active regional development of the city and especially the educational system influenced greatly in

building the competence base that has since been very important for the development of the local industry.

The restructuring of the old industries started in the late 1970's and lasted through out the 1980's. To complement the rapid structural transformation of the region, something not yet existing was to be created, new industries based on new technologies and to services. In 1983 the Tampere Chamber of Commerce and Industry listed means to develop the regions industry into something new (see the list below). These points have since been the cornerstones of the region's innovation policy.

- A science and technology park was to be set up in the Tampere Region
- The institutions of higher education, industry and the communities were to start developing industry based on new technology
- A regional development company was to be established, it's goal being to bring forth new business and product ideas
- Creativity and entrepreneurship was to be encouraged
- General and common objectives was to be set for the region's business development

Tampere University of Technology has been the trend setter in Finland in university-industry collaboration since the late 1970's. This has resulted during the past 25 years in a very positive development of the region. In 1986 Tampere Technology Centre Ltd. was founded in the immediate vicinity of Tampere University of Technology. The following year Nokia Corporation set up a research unit in Tampere, which has grown to Nokia's biggest single R&D concentration in the world, employing ca. 4000 people.

In the early 1990's, while Finland experienced the worst recession since World War II, the government policy was to invest heavily in research, development and education. At the same time, regions started to develop intensively their own regional innovation policies. Tampere was no exception. The fruits of these seeds can now be reaped.

At the same time the infrastructure for the innovation activities strongly begun to develop. A development company Finn-Medi Research was founded to boost the growth and development of the health technology and life sciences concentration in the proximity of the Tampere university and university hospital. Media Tampere Ltd. and Professia Ltd. were founded to

promote the development in content and media industries and knowledge intensive business services, respectively. The restructuring of two polytechnics in 1996 and 1997 also contributed to the development of the Tampere Region's innovation infrastructure.

3. SCIENCE, TECHNOLOGY AND INNOVATION, REGIONAL STRATEGY

3.1 Cluster based regional development

The vision of the Tampere Region is to be one of the most attractive environments for knowledge intensive businesses and professionals. The region's objective is to develop a competitive operating environment for knowledge intensive companies and to attract highly skilled labour to the Tampere Region.

The City of Tampere comprehensive business policy is based on six elements:

- Infrastructure
- Strategic clusters
- Quality of environment
- Human resources
- Business fields and clusters
- Regional innovation system

The region has carried out a cluster based innovation policy for the past 15 years. In the heart of this development is an interaction between novel and older industrial clusters that form the economic core of the region. Presently, there are six clusters that are in the focal point of development actions, namely mechanical engineering and automation, ICT, media content and services, life science and health technologies, tourism and meetings' industry and knowledge intensive business services (see the figure 3).

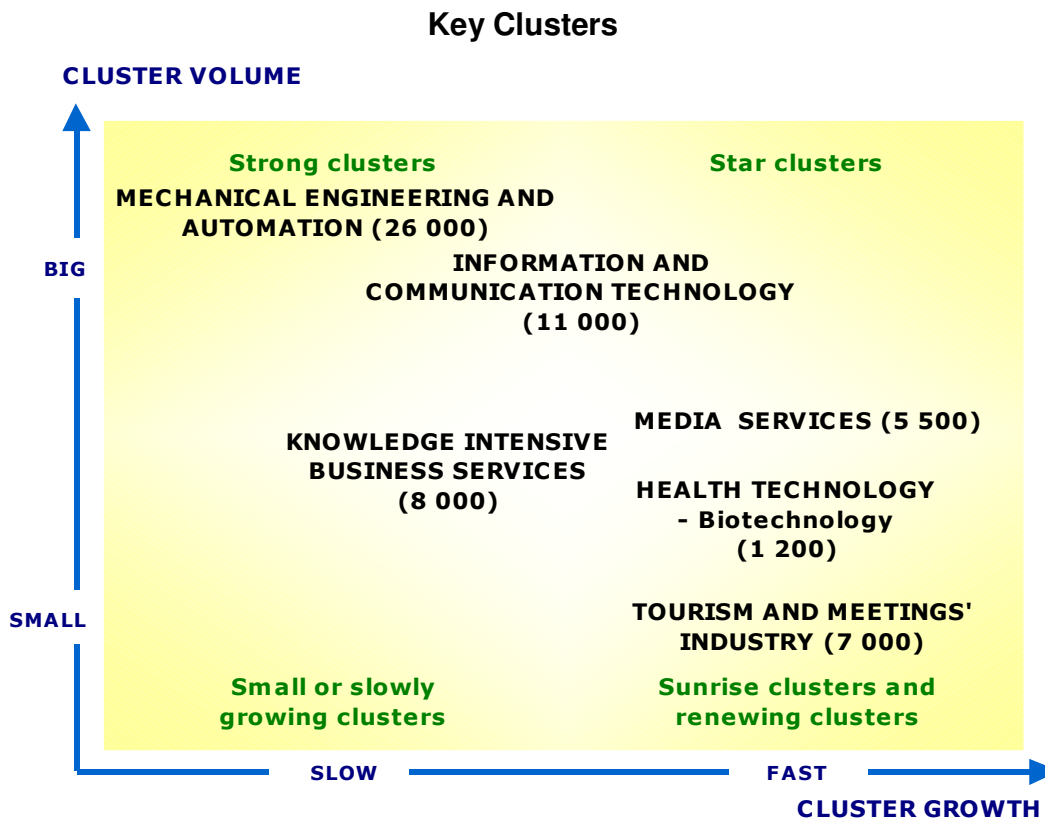


Figure 3. Key clusters in the Tampere Region (number of employees given in parentheses). It should be noted that the number of employees in the health and biotechnology cluster does not consist of the personnel in the public & private health care sector. (Source: Tampere business development centre 2004)

3.2 Towards regional innovation policy

The innovation policy in the region is carried out through permanent organizations and several development programs. While there are permanent structures in the regional innovation system such as funding agencies, regional and local business development units and development firms, the major development activities take place through extensive development programs that bring together regional and national firms, universities, research centers, development firms, and citizens. These programs last several years (typically 5-10 years) and the total funding is tens of millions of €. The role of the municipality funding for these programs is to act as a catalyst: typically the municipalities fund these programs with a total of few million €.

To bring about the total effect, under these large umbrella programs various funding sources and activities are pooled together to achieve more than any of the parties involved could accomplish alone.

The Tampere Centre of Expertise Program is an important platform policy tool for the development of the area. Through this program, enterprises in the whole region gain a common channel for developing their operations in the chosen fields of expertise. Alignment of the Tampere Region innovation policy has been convergent with the Centre of Expertise Program.

The Centre of Expertise Program (CoE), 1994-2006, is based on a cluster-centred development model (see the fig. 4). The development work itself has been allocated to several specialized organizations. Finn-Medi Research Ltd. is responsible for the implementation of the Centre of Expertise for health care technology, Technology Centre Hermia Ltd, for mechanical engineering, automation and ICT, Media Tampere Ltd, was responsible for media and content services but after the merger with Professia Ltd, in March 2006, Professia took the responsibility of the two Centres of Expertise: media and content services and knowledge-intensive business services. In the nationwide networked Centre of Expertise for Tourism, the special field of Tampere is the Meetings Industry.

Innovation System – The Tampere Model

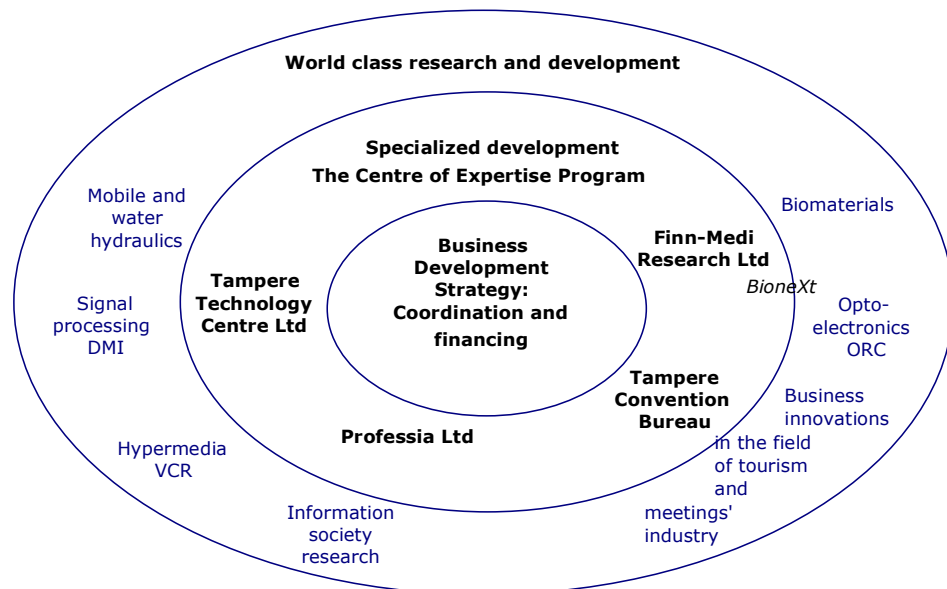


Figure 4. The regional innovation system. (Source: Tampere business development centre 2004)

The Tampere Region centre of expertise program is one example of program based regional development. The centre of expertise program is an underlying backbone program of all the other activities. The CoE program promotes business development based on leading expertise as an international point of contact for expert cooperation and by advancing contacts between enterprises and educational and research institutions as well as launching enterprise-oriented research projects. The centre of expertise program and its sub-projects provide businesses with alternative ways of developing their competitiveness. In addition, the program promotes internationalisation and research in the Tampere Region. Of the annual investment of some 1, 5 million €, 50% comes from the town and municipalities in the central region and 50% from the government through the Council of Tampere Region.

The eTampere program was a five-year, 132 million €, development project (2001-2005). Its general objective was to make Tampere a leader in the research, development and application of the Knowledge Society. The program was an extensive collaborate project to, which the local educational and research institutes, businesses, organisations and communities contributed their own expertise and input. eTampere concentrated on three themes: Network services that eased citizen's daily lives were developed and brought within the reach of everyone, the foundation of expertise in research and education was strengthened, new innovative business was created. eTampere program was a well known trend setter in European knowledge society development.

BioneXt Tampere is a development and investment program (2001–2010) that focuses on top-level research, product development, clinical application and the international commercialization of biotechnology and promoting health and well-being. BioneXt aims to achieve investments totalling of 100 million € by the year 2010. The program places an emphasis on persistently building competitiveness on the strategic level by promoting multidisciplinary research and product development in various fields of biotechnology. It also corroborates cooperation between producers of health care services, businesses and financial institutions. At the same time, the program lays a new foundation of expertise that enables the strengthening of knowledge-intensive business activity in the Tampere Region.

3.3 Future actions

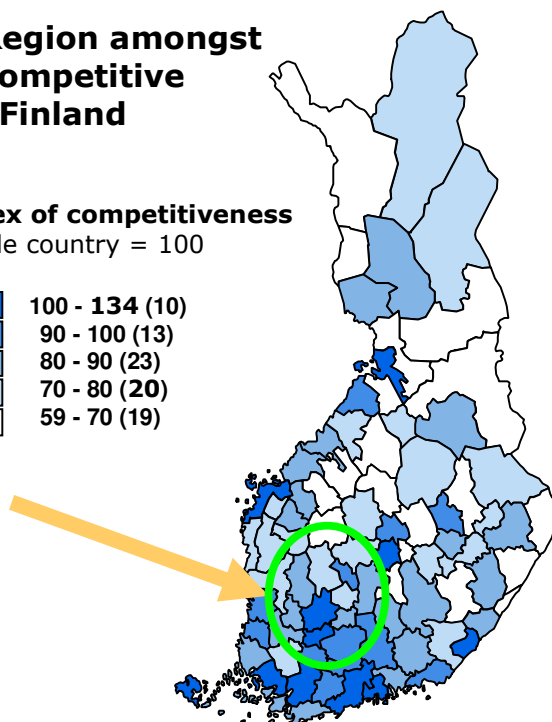
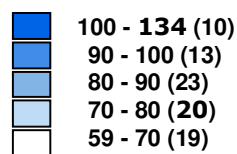
Technology foresight and knowledge management are important factors in regional development activities. The Tampere Region Innovation Council, which consists of the regions leading professionals from industry, academia, public and third sector, was founded in 2004 to assess scientific and technological evolution. The aim and tasks of the council are:

- To help obtain information about possible areas of further technologies in support of business needs and for the benefit of regional economic and social development
- To keep regional economy in the forefront on technological development
- To solve social and economic challenges on regional level
- Promote networking and creation of “new business-foresight” culture
- Give impacts on technology research and knowledge creation & its utilization (human resource development)
- Impact on local innovativeness = regional competitiveness

The competitiveness of the Tampere Region has always based on the capability to take advantage of the latest technology. However, presently the trend from technology based business to more solution and service driven economy continues and becomes stronger. That is and will also be the challenge for the future. The cornerstones that will secure the regions success are a successful combination of learning, the industrial tradition and the information society, observing the principles of sustainable development in all municipal operations, keeping the proportion of a young active population relatively large and to sustain Tampere’s ability to continue to make timely, courageous decisions and decisions vital for its development.

Tampere Region amongst the most competitive regions in Finland

Index of competitiveness
Whole country = 100



Competitiveness clearly correlates earnings growth, growth in employment, net migration and economic development.

A large part of the competitiveness is explained by human capital, innovation and R&D investment.

Figure 5. The Competitive Tampere Region. (Source: The Council of Tampere Region)

4. DESCRIPTION OF KNOWLEDGE DOMAINS, AGENTS AND INTERACTIONS

4.1 Universities and research institutions

The University of Tampere <http://www.uta.fi/english/index.html> was formally founded in 1966 but its history begins already in 1925. The university is multidisciplinary and committed to scientific research and to teaching. The hallmark of the university is sound, diverse research and teaching focussed on society, its economy, administration and culture and on the health and welfare of individuals. The activities of the University of Tampere are mostly concentrated on the premises around its main campus. The University also operates in other towns, with a teacher education department in the town of Hämeenlinna, the Centre for Extension Studies facilities in

Hämeenlinna and in the town of Seinäjoki, and a unit in Pori with focus on sociology, social policy and social work study programs.

There are six faculties in the University of Tampere:

- Faculty of Social Sciences
- Faculty of Humanities
- Faculty of Economics and Administration including the school of economics and business administration
- Faculty of Medicine
- Faculty of Education
- Faculty of Information Sciences

The University has some 15400 degree students, 12700 taking first degrees, some 1900 postgraduates and 800 other students. Approximately 16000 students annually participate in continuing education courses and programs. In 2004, the intake was about 1700 new students. In 2004, some 1500 degrees were awarded of which about 100 were PhDs. The University of Tampere offers also degree programs in English in three different faculties. The number of foreign students is 700. The University employs approximately 2100 people. The annual turnover of the university is about 120 million € of which some 40 million € is gathered from external sources and 80 million € is provided directly from the government. Private companies fund research at the Tampere University with about 9 million € or 7, 5% of total university turnover.

Research institutes at the University of Tampere include:

The Institute of Medical Technology, IMT <http://www.uta.fi/imt/> of the University of Tampere is located at the Finn-Medi technology centre. The IMT's research programs cover two broad areas, molecular genetics of human disease and molecular mechanisms of immune responses and disorders.

The Hypermedia Laboratory http://www.uta.fi/hyper/index_en.html at the University of Tampere offers education on interactive and digital media. In addition to education the Hypermedia Laboratory conducts research and development of hypermedia in different aspects of science.

The Research Unit for Urban and Regional Development Studies, Sente

http://www.sjoki.uta.fi/sente/index_en.php is one of the research groups at the Department of Regional Studies, University of Tampere. Sente's research work focuses on various decentralised systems, it focuses on games played in various regional and urban policy fields characterised by shared power.

The Research Institute for Social Sciences, RISS

<http://www.uta.fi/laitokset/yty/english.html> comprises several units with diverse research profiles and operating principles. Our common endeavour is to advance and strengthen the position of research within the University of Tampere.

The Business Research and Education Centre, Synergos

<http://www.uta.fi/brc/english.html> is a unit of the University of Tampere that engages in research, evaluation and educational assignments from public institutions and private enterprises. The Centre is a part of the faculty of Economics and Administration and the department of Business Administration. The main focus is in SME's and their business environment.

Tampere Unit for Computer-Human Interaction, TAUCHI <http://www.cs.uta.fi/hci/> is a unit which offers courses in Human-Computer interaction and has several research groups working in human-computer interaction related research fields.

Research group for science, technology and innovation studies, TaSTI

<http://www.uta.fi/laitokset/yty/tasti/english.html> conducts research that provides answers to challenges created by information society development and globalization. The research helps to understand the functioning of science and technology systems and the processes of generating knowledge and innovations.

Tampere University Hospital, TAYS functions on three different districts in Kangasala, Nokia and in the City of Tampere, 34 special fields are represented in the University hospital. TAYS provides basic and special health care services.

Tampere University of Technology (TUT) <http://www.tut.fi/public/index.cfm?siteid=32> was founded in 1965 as the Helsinki Technical University subsidiary, and it got its independence in 1972. The University specializes in the education and scientific research in engineering, technology and architecture. TUT offers its students versatile undergraduate, postgraduate and continuing education in technology and architecture. In its research, TUT produces new technological knowledge and subsequent new innovations for the industry at large. TUT strengthens the business environment in the Tampere Region especially through very close collaboration with the business world by providing training, development and research services.

The University has some 11700 degree students, over 10000 of whom are taking first degrees and almost 2000 are postgraduates. In 2003 the intake was ca. 1400 new students and 713 Master of Science degrees were granted. There are also some 570 foreign students. The University employs some 1800 people. The Tampere University of Technology has also units in the towns of Pori, Lahti, Rauma, Kokkola, Valkeakoski, Hyvinkää and Seinäjoki. TUT's turnover is about 106 million €. Approximately 60% of the funding came directly from the government and 40 % from various funding sources, including about 12% from private companies.

There are ten departments in the Tampere University of Technology:

- Department of Architecture
- Department of Automation
- Department of Civil Engineering
- Department of Electrical Engineering
- Department of Environmental Technology
- Department of Industrial Engineering and Management
- Department of Information Technology
- Department of Materials Engineering
- Department of Mechanical Engineering
- Department of Science and Engineering

During 2000 – 2005, TUT had three Centres of Excellence in Research, appointed by the Academy of Finland and the Ministry of Education: Biomaterials Research Group, Institute of Hydraulics and Automation and Signal Processing Research Group, which is also appointed for the present period 2006 - 2011.

The research at TUT is spearheaded by the following institutes

The Digital Media Institute, DMI

<http://www.tut.fi/dmi/index.cfm?MainSel=2429&Sel=2429&Show=2116&siteid=51>
specialises in digital signal processing, networked multimedia and System-on-Chip (SoC) integration. Research by the DMI is frequently commissioned by corporations.

The Institute of Biomaterials <http://www.tut.fi/units/ms/biom/> is one of the leading European research centres in materials technology of bio absorbable polymers, composites and surgical implants manufactured using them.

The Optoelectronics Research Centre, ORC <http://www.orc.tut.fi/> develops compound semiconductor technology and fibre optical communications systems, studies applied optics in cooperation with enterprises and facilitates undergraduate and postgraduate studies.

Ragnar Granit Institute <http://www.rgi.tut.fi/> research at Ragnar Granit Institute, the Institute of Biomedical Engineering at Tampere University of Technology, focuses on bioelectric and bio magnetic phenomena.

In addition to the universities, there are two major research organizations in the region, namely the aforementioned Tampere University Hospital, which is affiliated with the University of Tampere and the Technical Research Centre of Finland VTT.

Technical Research Centre of Finland, VTT <http://www.vtt.fi/?lang=en> is an impartial expert organisation that provides extensive technological and research services to businesses and the public sector. Units in Tampere specialize in industrial systems and automation, including e.g. virtual and simulation technologies, manufacturing automation, sensors and wireless communication, remote control and life cycle services.

4.2 Polytechnic universities

Pirkanmaa Polytechnic - University of Applied Sciences (PIRAMK) www.piramk.fi/english is a regional higher education institution located in Tampere, Ikaalinen, Mänttä and Virrat.

Pirkanmaa Polytechnic provides multidisciplinary education and develops professional know-how and work communities in the Tampere Region. The school has been established in 1997. There are more than 4000 students and 300 full-time employees in Pirkanmaa Polytechnic. In 2004, the intake was 755 new students. In the same year, 629 bachelor degrees were granted. Pirkanmaa Polytechnic's annual budget was 23 million € in 2004 of which 20 million (87%) was from the Ministry of Education.

The Pirkanmaa Polytechnic provides degree programs in the field of social services, health and sports, music, hospitality management, service management and laboratory sciences and the option of marketing of agricultural and rural industries in the degree program in business administration

The research, development and consulting unit of Pirkanmaa Polytechnic offers diverse development projects, education and career and recruitment services for companies and communities as well as for students, trainees and thesis projects.

Tampere Polytechnic - University of Applied Sciences (TAMK)

<http://www.tamk.fi/servlet/sivu/0/250334> is a multidisciplinary polytechnic of applied sciences with a strong industrial and business focus. It offers bachelor level degrees in Art and Media, Business Economics and Technology. Two Bachelor degree programs, BBA in International Business and BEng in Environmental Engineering are taught completely in English. A second-cycle polytechnic degree is offered in Business Administration, and the Teacher Education Centre also offers post-graduate education. The school has a long history but it started as polytechnic in 1996.

There are 5000 students, 15 degree programs and 400 full- and 700 part-time staff members at Tampere Polytechnic. New students were in taken 1300 and 734 passed degree in 2004. The polytechnic is located on two campuses in the city centre. The school had 104 foreign students in 2003. Tampere Polytechnic ranks among the three top polytechnics in Finland.

HAMK University of Applied Sciences www.hamk.fi is a polytechnic university of applied sciences with more than 20 degree programs, 7500 students and 800 employees. It started operating in 1997. It offers broad-based, high-quality education, research and development with

focus on internationalisation. HAMK's fields of education are culture, natural resources and the environment, natural sciences, social sciences, business and administration, social services, health and sports, technology, communication and transport, tourism, catering and domestic services and vocational teacher education.

4.3 Vocational Institutions

Tampere College http://www.tao.tampere.fi/content.php?ktg_id=191&db_id=1 was founded in 2000 from five different institutions. There are 3500 students, 4000 adult students and 400 staff members. The college co-operates closely with the regions firms and other employers. The college offers study programs in English for international students and preparatory teaching for immigrants intending to enter into vocational education.

Pirkanmaa Vocational Skills Centre

http://server.perlasoft.fi/PIRTAPRO/index.php?PAGE=1&NODE_ID=1&LANG=1 was founded in 1999 from five different institutions. The departments are hotel and restaurant studies, catering, technology and transport, crafts and design and apprenticeship centre.

4.4 Tampere Science Parks

Tampere Science Parks Ltd. http://www.tamperescienceparks.fi/in_english/ The science parks in Tampere provide developing operational environments for technology-oriented companies. The real estate activities of Tampere's science parks were reorganized in the summer 2004. Now the development of the premises and services of both the Hermia and Finn-Medi science parks are operated by Tampere Science Parks Ltd.

Hermia Science Park http://www3.hermia.fi/in_english/ is a concentration of expertise in the proximity of Tampere University of Technology. 3000 persons work in the Hermia Science Parks premises. There is 100000 m² of office space in Hermia, which is home to 150 companies and research organizations. It is located close to the Tampere University of Technology and is in

direct contact with the university's top specialists and also with the Technical Research Centre of Finland, VTT.

Finn-Medi Science Park <http://www.finnmedi.fi/english/> which is located in the campus of the Tampere University Hospital and the Tampere University Medical School, currently comprises 155000 m². It is home to approximately 20 companies and research organizations providing ca. 5000 jobs. It is a combination of multi-disciplinary, technological, bio-medical and medical expertise and an efficient operational environment. This expertise and environment make Finn-Medi an attractive entity of research, innovations and business as well as a good target for investors. The Finn-Medi campus area comprises of the technology centre that focuses on research and development activities and new business generation, the Tampere University Hospital and the Finn-Medi Park.

4.5 Technology transfer

Technology Centre Hermia Ltd. http://www3.hermia.fi/in_english/ was established in 1990 (then under the name Tampere Technology Centre) as a development and administration company for Hermia Science Park. Business development activities were launched in 1992. In 1994, regional development was introduced as one of the technology centre's activities. Since November 2002, business development services have been coordinated by the Hermia Business Development Ltd. At the moment there are about 25 employees at the Technology Centre Hermia whose annual turnover is ca. 5, 5 million€.

Finn-Medi Research Ltd. http://www.finnmediresearch.com/in_english/ is the development engine of the Finn-Medi health care technology concentration. Finn-Medi Research works with start-ups, commercialisation, R&D services, and the development of innovation and technology transfer system. Finn-Medi Research employs 14 people and its annual turnover is ca. 2, 6 million €.

Tamlink Ltd. <http://www.tamlink.fi/eng/> has operated in technology transfer business since 1986 in close co-operation with industry and research organizations. Tamlink's main product is the design and implementation of industrial research, technology and development projects. Tamlink employs 5 people and its annual turnover is ca. 1, 3 million €.

Professia Ltd. http://www.professia.fi/in_english/ provides services to start-ups, already established companies and also to researchers and other personnel in universities and colleges in Tampere. The company also plays a central role in marketing the regional knowledge base. Professia's goal is to help companies in their efforts to grow and network by strengthening their business expertise, clarifying their strategy and assisting in planning and acquiring the required financing. Professia employs 15 people and had a turnover of about 2, 9 million €.

4.6 Funding and financing

Employment and Economic Development Centre of Tampere Region, TE-Centre <http://www.te-keskus.fi/web/tepir.nsf/FrameSetENG?OpenFrameSet> The Ministry of Trade and Industry, the Ministry of Agriculture and Forestry and the Ministry of Labour have jointly combined their regional forces in the Employment and Economic Development Centers (TE-centres). Fifteen centers, which TE-Centre of the Tampere Region is one, countrywide provide a range of advisory and development services for businesses, entrepreneurs, and private individuals. One of the tasks is to speed up internationalization and access to foreign markets, particularly for SMEs.

National Technology Agency of Finland, TEKES <http://www.tekes.fi/eng/>

Tekes is a national agency under the umbrella of the Ministry of Trade and Industry. Tekes is the main Finnish public funding organization for research and development. It has offices both in Finland and abroad. Tekes funds industrial research and development projects as well as projects in research institutes, especially those that promote innovative and risk-intensive projects. Also foreign companies that have established a business unit in Finland are entitled to Tekes funding. In addition Tekes offers technology-oriented partners from abroad a gateway to the key technology players in Finland. The regional operations are carried out through the TE-centres (see above).

Finnvera Plc. <http://www.finnvera.fi/index.cfm?id=3> is a government owned specialised financing company offering financing services to promote the operations of Finnish businesses, and to further exports and internationalisation of enterprises. Finnvera has a large portfolio of loan and guarantee instruments for the companies to choose from.

Venture Capital funding

Venture capital funding in the region is provided by three management companies Sentica Partners Ltd., Innofinance Ltd. and Hermia Business Development Ltd.

Innofinance Ltd. http://www.innofinance.fi/en_GB/ manages funds that invest in very early stage knowledge based start-ups. The management firm has made several investments in southern Finland. Through their five funds they are involved in the activities of some 70 growing companies. Funds under management are 13, 5 million €.

Hermia Business Development Ltd. <http://www.hermiayrityskehitys.fi/english/index.htm> manages Hermia Ventures Fund, it is a new early stage fund. Hermia Ventures Fund started in 2005 and has since made 4 investments.

Sentica Partners Ltd. <http://www.sentica.fi/eng/cfmldocs/> manages several funds with operations in southern Finland with a dual focus. One set of funds invests in traditional industries with a secure growth pattern. The other set of funds invests in aggressively growing firms. Total amount of assets under Sentica Partner's management is 74 million €.

4.7 Focused business development programs

Neogames <http://www.neogames.fi/fingames/index.htm> creates a games business cluster in Finland and expands the international network. The Neogames development centre operates within the Technology Centre Hermia with the purpose of forming a national cluster in the games field. The cluster's assembly is based on a survey conducted at the University of Art and Design's Media Centre Lume, concerning the structure and state of games-related activity in Finland.

COSS <http://www.coss.fi/en/> the initiative for Finnish Centre for Open Source Software has been launched at the beginning of 2004. COSS aims at recognizing versatile ways of utilizing Open Source in different business sectors and making Open Source more familiar in different user groups; implement development projects together with corporate partners to improve usability of Open Source components and solutions; create co-operation and networking in between

developers and corporate partners; make Finnish Open Source know-how better known internationally. COSS network is open for companies, communities and public organizations.

eYrityspalvelu http://www.eliiiketoiminta.com/alue_esittely.asp?lang=eng&area=pirkanmaa

makes it easier for the Tampere Region companies to start using electronic services, impartially and widely it looks for alternatives among good practice and professional partners, and introduces them to your company. eYrityspalvelu was an eTampere service for small and medium-sized companies. Presently it is carried out by Pirkanmaan Yrittäjät.

Creative Tampere 2011 is an economic development policy program, which will be implemented in 2006–2011. The objective is to lift cultural industry into a strategic competence area, to create new service innovations, and to provide conditions for creativity and creative structures. The program presents the focus areas in the development of cultural industry, business and business incubator projects. It also offers economical premises, develops the business network and marketing of the AV industry, and promotes the implementation of a mobile and wireless Tampere.

In addition there are several business development forums in the Tampere Region that are mainly coordinated by Technology Centre Hermia Ltd.

National Forum for Intelligent Machines, FIMA More than 30 members (mobile work machine manufacturers, research units, suppliers of automation etc.) www.fima.fi

Laser Competence Center Finland, LCC Finland works to strengthen its members position in research and development activities. It also promotes the laser cluster in international forums. www.lccfinland.fi

Centre for Sustainable Energy Solutions, Sentre www.sentre.fi/english/ It is a developer network in the field of energy.

Centre for Remote Operation and Virtual Reality, ROViR www.rovir.fi is a versatile enterprise developing remote handling and virtual technology for industrial applications.

4.8 Regional development agencies

Tampere City Business Development Centre's

<http://www.tampere.fi/english/jobsandbusiness.html> main task is to plan and implement the city's business strategy. The business strategy sets the general guidelines for the city's business and industrial structure. The Business Development Centre operates in co-operation with an extensive network of participants within the framework of a number of projects and initiatives. The most current projects include the already completed eTampere and the ongoing BioneXt projects, as well as initiatives focusing on general promotion of expertise and know-how.

The Council of Tampere Region <http://www.pirkanmaa.fi/english/council/> is one of Finland's 19 regional councils. It is a joint municipal authority maintained by 33 municipalities, with 455000 inhabitants within its area. The activities of the Council are based on the legislation on municipalities, which defines the administrative structures, operation legality and forms of decision-making. The Council operates as regional development and regional planning authority according to the principles of local self-government.

Business development Centres in all the municipalities of the Region. Every municipality is independently responsible for its development since there is no general development company for that (see above).

Tampere International Business Office TIBO www.investintampere.com

The focus of TIBO is in transforming the Tampere Region into an increasingly vibrant business environment by attracting investments to support the region's business and expertise. TIBO concentrates especially in strengthening the region's already existing clusters of information and communication technology, mechanical engineering and automation and health technology.

4.9 Business Incubators in the Tampere Region

Finn-Medi Research Ltd. http://www.finnmediresearch.com/in_english/ merges new medical knowledge and technical expertise to develop customers' products and technology for their success. Finn-Medi Research is in charge of start-ups, commercialisation, R&D services, and

the development of innovation and technology transfer system. Through its national and international networks Finn-Medi Research offers the latest information and expertise.

Hermia Business Development Ltd. <http://www.hermiayrityskehitys.fi/english/index.htm> is a company, which aim is to help customers to commercialise their technology based product and business innovations, and to develop business of technology based companies. Their customers include inventors, students, researchers and existing technology based companies with growth potential.

Professia Ltd. http://www.professia.fi/in_english/ develops knowledge-intensive business service companies. Professia provides services to start-ups, already established companies and also to researchers and other personnel in universities and colleges in Tampere. Professia also offers incubator services for start-up knowledge-intensive companies. This service includes business plan preparation, seeking financing and offering modern premises and telecommunications. The wide expertise of our partners is also available.

4.10 Other interest groups

Tampere Chamber of Commerce & Industry (TCCI)

http://www.tampere.chamber.fi/alasivu.php3?target=cr_page&id=69 represents businesses in the Tampere Region. It is established and maintained by the regions companies. It has 1300 member companies, which represent different sizes and branches of business. The main objective of the Tampere CCI is to maintain the regions favourable and attractive environment for business and create an atmosphere that would support entrepreneurship.

The Tampere Region Entrepreneurs is an association, which is promoting the interests of the regions small and medium sized companies. The association acts as an advisor and also as an opinion leader. Its aim is to create a better business environment for entrepreneurs.

Tampere Region Cooperative Centre has operated since 1998 and promoted co-operative entrepreneurship through counselling, education and information dissemination. Anyone considering setting up a co-operative can obtain practical advice and moral support from the very

first steps of the establishment process. The new co-operatives are offered overall expertise taking into account of the individuals of which the co-operative is to be formed.

5. REGIONAL SWOT ANALYSIS

The following SWOT analysis points out the strengths, opportunities, weaknesses and threats of the Tampere Region. The analysis is greatly based on the business point of view.

<p style="text-align: center;">STRENGTHS</p> <ul style="list-style-type: none"> ○ Strong clusters and top expertise in <ul style="list-style-type: none"> ○ Information and communication technology ○ Mechanical Engineering and Automation, ○ Bio- and Health Care Technology, ○ Several global market leaders in the region form a solid customer base in world class clusters ○ One of the least corrupted countries in the world ○ Finland is one of the most competitive countries in the world ○ Quality of life: recent studies show that the Tampere Region is the most attractive place to live, work and study in Finland 	<p style="text-align: center;">OPPORTUNITIES</p> <ul style="list-style-type: none"> ○ Closeness to the Nordic, Russian and Baltic markets ○ Low labour costs of for example engineers, if compared to the rest of the Europe ○ Collaborative business climate: multidisciplinary approach and good cooperation between education and business ○ Safe environment for business ○ Accessibility: Direct flight connections to and from Europe ○ Exotic and attractive location for business and living: beautiful and clean nature is close by everywhere in the region ○ Highly educated and skilled workforce
<p style="text-align: center;">WEAKNESSES</p> <ul style="list-style-type: none"> ○ Finland is unfortunately often thought to be cold and dark country during the wintertime ○ Unknown language, which is spoken only in Finland ○ Relatively high living costs ○ The domestic market in Finland is fairly small 	<p style="text-align: center;">THREATS</p> <ul style="list-style-type: none"> ○ Unfamiliarity of the possibilities in the Tampere Region ○ Incapability to attract expertise to Finland ○ Dependence of the global market leaders including Nokia ○ Maintaining the competitiveness in the global market especially against the low-cost countries ○ Sustain the ability for development and innovations: brain drain abroad ○ Competition with the other Finnish regions ○ The development of the right (wrong) technologies ○ Risk for ignoring the big technology changes

6. CONCLUSIONS

The future challenges in regional development and in taking advantage of the all the existing knowledge assets in the Tampere Region lie, for the most part, in the effectiveness of regional cooperation and the proper functioning of the new and already established regional organs.

In 2004, the Tampere Region Innovation Council was founded to assess scientific and technological evolution and megatrends. Two years before in 2002 the Tampere Region preindication services were created to gather information and to create visions of the future for medium and long-term. The aim of this service is to create a preindication system to the Tampere Region, which produces systematic information about the future needs of employment and expertise and the development of business sectors for the use of strategical planning in business and public sector. The future goal is to implement the functioning of the innovation council and the preindication services and in addition to disseminate the information that they produce particularly to the use of enterprises and educational institutes.

In a relatively small region like the Tampere Region the cooperation between different parties and municipalities is one of the key issues when accelerating the regional development and assuring the regional competitiveness. Strengthening of regional cooperation in particular between the municipalities is one of the region's main tasks. Therefore, a vision could be for example to establish a joint regional business development centre to facilitate and speed up the regional decision making processes and make the functions more effective. This is, however, only one way to approach the regional development framework. It is also essential that the regional internationalization continues and that resources are allocated into it. Relating to the aforementioned the interregional cooperation in different EU and other projects is also fundamental for the Tampere Region's ability to continuously develop, sustain the innovativeness and to prosper.

In Finland, the national Centre of Expertise Program's second period is at its final phase at the moment and the third program period starts in 2007. During the next period 2007–2013 the program will be transformed into a more cluster based development program. The relevance of business knowledge as well as the different types of service businesses are taken more into

account in it. Hence, also the importance of the expertise in the knowledge management is emphasised. Also the biggest challenges in Finland nationwide as well as in the Tampere Region is promoting the top expertise here, that is likewise one of the objectives of the third Centre of Expertise Program.

As a conclusion it can be said, that the investments, which have been made to education are still the main factors that guarantee the continuous success and competitiveness of the Tampere Region. In addition the systematic and well coordinated knowledge management between the different regional bodies is a key matter in the regional development.

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