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***The development process of the Finnish national innovation culture, policy and strategies in 1980-2008. The role of Science Parks and the network of STPs.***

*Plenary Session 3:*

*Innovation and business country culture in relation to the development and success of STPs*

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# **The development process of the Finnish national innovation culture, policy and strategies in 1980-2008. The role of science parks and the network of STPs.**

Given by:

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## **Executive Summary:**

*The objective of the author is to describe the frames, the historical and current underlying factors, which have affected Finland's development as a national economy and as a technology nation. Technology parks and their regionally and nationally defined operations have had a significant role in this development. The role of the science and technology parks has changed; in the beginning technology parks mainly built and offered facilities near universities, followed by the emphasis on new businesses and ideas and commercialising research findings. This was followed by specialisation, networking and development of business clusters; currently technology parks emphasise globalisation, as it is required by growth and development. Emphasis has changed and will continue to change.*

**Keywords:** Finland's economic development, national innovation policy, the development of STP operation, Centre of Expertise Programme, clusters, networking, STP operation today.

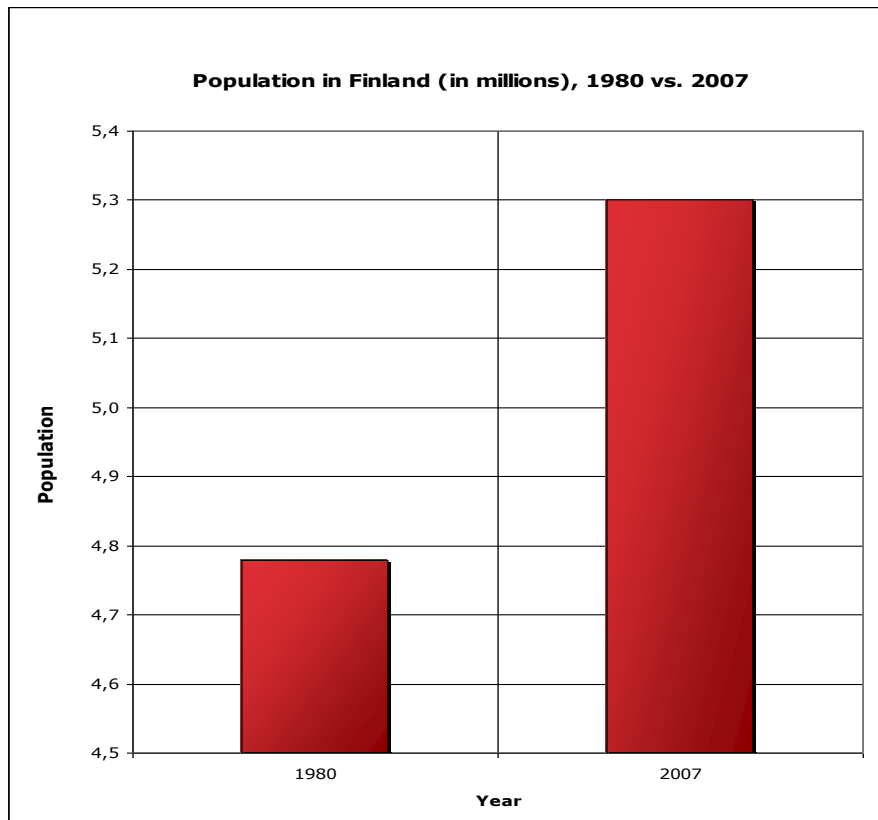
Dear Ladies and Gentlemen,

The purpose of my presentation is to discuss the national development of one country, Nordic Finland, from an agricultural and (large-scale) industrialised nation towards an information and know how society. The studied time period is from 1980 to 2008, during which the network of technology parks covering Finland has been established.

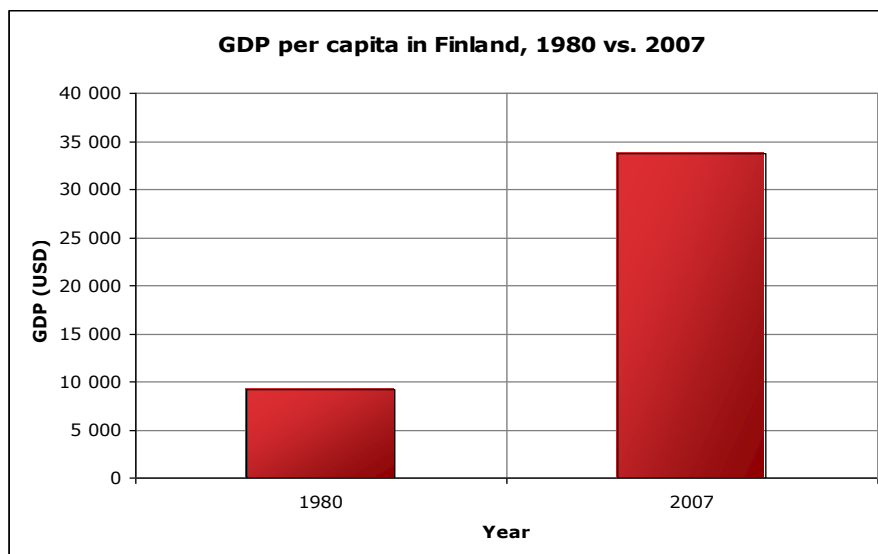
## **1. Development of Finland's national economy 1980 - 2008. The type of change that has taken place.**

First, I am introducing some key figures from the 1980's in Finland. Population was 4,8 million, gross domestic product at the rate of the reference year 2000 was 80.8 B€, and GDP per capita was 6.971 €.

The corresponding numbers in 2007: population 5.5 million, GDP at year 2000 reference rate 157.4 B€, and GDP per capita 31.723 €. Changes in the different indicators are best shown in the graphs.



(Source: OECD)



(Source: OECD)

The change can be examined by many variables, for example, with the import to export ratio in technological industry, in which there has been considerable change during the time period in question.

Hence, a significant change can be noted to have taken place within the last 25 years. In general, the development has been constant; however, there is one significant discontinuity that took place in the beginning of 1990's. Development of national economy was hit by a deep recession from 1991 to 1994, stemming primarily from domestic issues, during which, for example, GDP and other key figures plunged substantially. In retrospect, it has been observed that much was learned from the recession, and that it stimulated strong recovery

efforts by different sectors, which in turn resulted in even more accelerated development. Being able to maintain national focus points in education, research and development of new technologies was significant. These investments even continued to grow during the deep recession of the national economy. This was based on a national strategy formed already in 1950's-60's, with the primary emphasis on increasing R&D investments and significant investments in education, especially in the quality and quantity of higher education, as well as, in regional dimensions.

Finnish education and research, as well as technology and innovation policies have had one important national distinction: perseverance and consistency, which has meant that even though the developmental phase lasting many decades has witnessed a great number of governments with different political coalitions all of them have implemented the same strategy over this policy sector, targeting persistent growth and development.

## **2. National innovation policy and the related fundamental choices.**

Embedded in the change and development that has taken place in Finland, which is described in broad terms above, are national strategy related choices, decisions and actions, which have advanced development in a significant manner.

As a result of debate and political arm-wrestle dating back to the 1970's, some new, so-called countryside universities were established in Finland. In reality they were not located in rural areas but in cities, but taking into consideration the size of the country and population density - currently 17 inhabitants / km<sup>2</sup>, it can be said that the universities were placed in the "countryside". All universities were not then, nor are they now, comprehensive universities with all faculties, but with their help the availability of higher education was increased nationwide and conditions for development of university level research activities were created. Currently there are more than 20 universities with about 180.000 students in total. It is interesting that now, since it is necessary to improve the efficiency of the system, the time has come to discuss the revitalisation of the university structure by integration and the creation of stronger university systems to respond to international competition and development.

Chronologically the next significant decision was the establishment of Sitra, the Finnish Innovation Fund, to celebrate the 50<sup>th</sup> anniversary of Finnish independence and based on the parliamentary decision of December 5<sup>th</sup>, 1967. The Fund has operated from that point on as an independent institution under the Parliament, with the task of maintaining Finland's steady national development and international competitiveness. In regards to innovation policy, Sitra has played an important role in financing capital investment and business development operations and in developing operational structures.

The next decision regarding the central institution was the establishment of Tekes (Finnish Funding Agency for Technology and Innovation) on July 1<sup>st</sup>, 1983. The development, in a way, is also described by the evolution of the name for the same institution, Tekes, during its time of operation. From its establishment, Tekes has operated as a primary partial financier for business-based R&D projects in the public sector. Tekes' technology programmes have been, during its 25 years of operation, imperative in the development of different technology sectors in Finland.

Defining the national strategy in Finland has essentially included the Science and Technology Policy Council of Finland based on the Council of State statute of December 12<sup>th</sup>, 1986. From

the beginning, it has been run by the prime minister of each term, and in addition to appointed ministers, based on the new statute, it now includes 10 experts from different fields. Its tasks constitute an 8-step list of operations, with the primary task to prepare plans and proposals regarding science and technology policy to the Council of State, that is to the country's government. This council has initiated many decision and implementation processes connected to R&D&I policy and resources.

Periodically the council publishes national guide documents, which include guidelines that each government has followed.

Over the years, the central government has thus made far-reaching principal decisions regarding structures and resources. It has constantly increased the solid R&D investments in the public sector, at the same time expecting it to lead to a comparable growth in the investments by the private sector. This, as a matter of fact, has always taken place until now. This leverage impact has resulted in the current level, where the R&D&I investments in Finland are around 3.5 % of GDP, which is at the topmost level in the world. However, as a small national economy, we must constantly keep in mind that our investment corresponds to only 1% of the global investment in research and development operations. This then requires an effective usage of the limited usable resources and continual and collective development of new operational methods and structures. This process in Finland contains quite centrally the science and technology parks and the network they constitute. Science and technology parks have offered an operational environment to businesses in their area and technological sector, which further offers value-added services essential to growth and development, including facilities and first and foremost contacts to business networks, universities and polytechnics, research institutes and to those national and regional programmes and projects, which can benefit the business.

There have been some basic national decisions that have had a notable impact on development. In 1990's the establishment of the polytechnics began in Finland, and from 2000, 28 permanent polytechnics operate in the country. They have approximately 130.000 students studying for "demands in professional life". Thus we are in a situation where higher education in close proximity of their place of residence is offered to about 75 % of the youth. The polytechnic network is an important cooperative entity for technology parks in basic regional operation. The revitalisation of the now expanded polytechnic structure and enlarging the unit size by reducing their number is currently debated in Finland.

A complete turn-around of the regional development paradigm is a significant decision that has impacted the national development in Finland. Described in simple terms, until the early 1990's, our country's operational mode in regional development policies was to channel financing to areas of the least success, in order to fix the largest deficiencies, and to fill the largest holes. It is clear that no money or resources was enough to change this situation significantly or permanently. Based on a broad examination, the Council of State passed a statute on December 10<sup>th</sup>, 1993 for regional development, which contains, once again simplified, the managing of resources to improve regional strengths. The statute contained a specification of strengthening of regional basis for EXPERTISE. Based on this statute, many actions and their implementation structures were started, e.g. Centre of Expertise Programme belongs to this group and has turned out to be quite essential. I have to mention that the former main architect for this process, Anssi Paasivirta who is present here, is now the TEM Group director, and still strongly involved in the process development.

Another two topics must be discussed, which have had a fundamental significance in expertise and technology oriented developments, and thereby also in the science park activities in Finland. Since their foundation, science and technology parks have formed bridges and

cooperative structures for operations between universities, polytechnics, research institutes and BUSINESSES. My own experience relating to this involves a descriptive event of the situation in Finland in the early 1990's. I was requested, as the TEKEL chairman of the Board back then, to give an introductory speech at the national convention for university chancellors. The topic was given and it was: "Technology Parks - university success factors or bloodsuckers". Since those times in Finland, a noteworthy improvement took place in the 1990's in this regard. Previously a university professor needed a special permission in order to work in corporate cooperation; nowadays it is not only the university doors that open, but also the minds of the researchers and teachers. The administration also opens more and more to cooperation between businesses and the rest of the society. This operation must of course be beneficial - a success factor - for the university as well. The developing technology parks offered an ingeniously neutral growth basis for increasing cooperation in this process. And now, universities in Finland have by statute, in addition to research and higher education, a third task - interaction and cooperation with the surrounding society. This change to university and polytechnic statute was proposed already in 1997, but it did not become effective until 1.8.2005. In the Finnish way, the operational mode for universities and polytechnics is thus confirmed by legislation.

The last underlying factor to be mentioned is a brand new large structural change in the implementation of national R&D&I policies in Finland. During the last government negotiation a plan was born for the merging of the three centrally implementing departments; ministry of trade and industry, ministry of labour, and ministry of the interior, which is responsible for regional development. Hence, the Ministry of Labour and The Economy was created, and started its operation in the beginning of 2008. In addition to this high level structural reform, the process will naturally have a large number of national and regional operational structure reforms, which expectedly will have a large significance on the operational efficiency.

The before mentioned landmarks describe those operations on the national level, in which the technology and expertise-oriented development has progressed. The practical side of the operation has naturally included a large number of outlook and operational mode developments and wants and needs for many changes in the national operational culture. An advantage for a small country is its flexibility, conductivity and a high degree of organisation, which has enabled the development to follow the same level as operators in practice.

### **3. The development of STP operation in Finland in 1980-2008 and the significance of the science and technology parks as a part of national innovation culture.**

The technology park concept made its global arrival even to Finland. Stories of global means of operation were heard and these ideas were first grasped upon in the Nordic countries by Finland's northern regional park in Oulu in 1982. A university was established in Oulu in 1958 and it represented an advanced "new" university, which was flexible in its operation and sought new operational modes. A pioneer in the Finnish technology park operation, later, among other things, the chairman of IASP International Board, currently the CEO of stock listed and Finland's largest technology park Technopolis LTD, Pertti Huuskonen got the idea to put a sign on top of an old dairy in 1982 stating "Technology Park". That is how the operation began for that park and in that way has began - that is raising a sign on top of the roof - many a park's operation even afterwards.

The actual formation of multiple parks in Finland dates at the end of 1980's and the beginning of 1990's. Then strengthened process led to times where almost all cities of decentralised university structure had a technology park. Growth has been mainly managed and based on distributed ownership. Throughout, municipalities and cities have had a central role in the creation and development of the parks. When we in TEKEL (Finnish Science Park Association) sector have defined requirements for the success of new STP-projects, we start from three basic items: 1) knowledge and expertise and production and usability of skilled personnel from perspective of businesses; 2) facilities and operational environments, as well as, the technological orientation of the businesses in the region and 3) administering and leadership. The last one also meaning the project's status in its region and the region's long-term commitment to it as a, so called, number one project.

Nowadays our network consists of 21 technology park localities in Finland and 33 operative companies are members of TEKEL, who with 750 employees implement the Finnish technology park concept. We define it with three basic functions: a) business development operations and services, b) facilities and operational environments and c) assignment and project operation. The ownership of the operative businesses is emphasised in the region's municipalities and cities. The technology park facilities are owned either by a separate real estate company, where cities and municipalities have often a significant share, or by Technopolis Ltd., which specialises on owning and developing technology park facilities. As a strong quoted company, Technopolis has in the last years been able to acquire equity from the markets and acquired a significant number of technology park properties, and simultaneously freed a considerable amount of university cities' financial obligations in technology park facilities. This has had a large progressive impact on operational development.

The Finnish Science Park association TEKEL was established in 1988, exactly 20 years ago, on behalf of seven member parks operating at that time. Tekel has operated and still operates as the technology park cooperation organisation and as a caretaker for technology and science park **operation** in the nation. It involves broad cooperation and impact on preparatory work in different sectors of the administration, departments and ministries, and in that way influences the decision making of this branch of industry at a national level.

In Finland the science and technology park network and TEKEL have a significant operative role in implementing national innovation policy. Examples of this are national innovative political programs, whose implementation is organised through the TEKEL network. The operational mode in question then is one in which the defined national determination associated with innovation policy changes to practical operation and managed process utilising the network. For this operation, we have developed sustainable tools and capacities for electronic network management.

The largest of the project systems has been the Centre of Expertise Programme that was established already in 1994. From the beginning, its implementation has used the TEKEL network. The third implementation period, 2007-2013, of the Programme is currently taking and involves 13 expertise clusters and 21 Centres of Expertise. The Programme has had a large significance also in the technology park's physical and operational development. As a persevering national, strongly managed programme, it has given operators a strong position when creating cooperative structures and common projects between research, education, businesses and administration. It has been a triple helix even before the concept was talked about and created clear frames for national businesses emphasizing with utilising expertise. This programme would need its own presentation, but I will use it in this one as an example



of how a managed science and technology park network can be used operationally as a national provider.

In Finland, therefore, in science and technology park operation there are two levels: a) regional, basic level, which is used to implement technology park operations significant for the region and operational environment and b) national program and project level, with which the mentioned regional parks partake in the network-like implementation of the national programmes and projects. These two levels are described by company contact numbers; TEKEL parks at this point are operated by 2 600 companies and organisation, but the network's contact base at the same time is about 14 400 companies. The cluster impact of the parks thus reaches about 12 000 companies outside the park, that is in the impact zone created by the programmes and projects. TEKEL's task has been and is still the coordination and "administering" of the operation regarding the network's national utilisation, as well as, the development of the network's capacity and management.

#### **4. How Finland uses and has used its science and technology parks**

A technology park can affect business development in many ways, for instance, offering the businesses in the technology park impact zone the easiest possible route to knowledge and expertise as well as to production of new technology. Here STPs, as neutral value-added service providers, are an important operator in developing and maintaining cooperative structures with universities and research and educational institutions. Nowadays a precondition for growth is most often also globalisation, even global perspective in business operation and related services can be produced in STP. Creative services, especially services connected with business development seen broadly and the ability for their utilisation play an important role in enabling business growth. STP should develop its operation as a producer of these services.

We have often said that the product of technology park operation is contact - we do not necessarily make or produce the value-added services, which are used for development by businesses inside the park and in its impact zone, but we offer a working connection, a contact to them. Operating as such, the technology park is a central operator in the regional innovative environment, who with very private-public and public-private connections offer new contacts for developable and willing businesses.

#### **5. Summary**

Dear friends, my objective has been more so to describe the frames, the historical and current underlying factors, which have affected Finland's development as a national economy and as a technology nation. Technology parks and their regionally and nationally defined operations have had a significant role in this development. The role of the science and technology parks has changed; in the beginning we mainly built and offered facilities near universities, followed by the emphasis on new businesses and ideas and commercialising research findings. This was followed by specialisation, networking and development of business clusters; currently we emphasise globalisation, as it is required by growth and development. Emphasis has changed and will continue to change. We will do what we can in order to further develop our operational modes and structures, because our limited resources are only sufficient for well organised and focused operation. I believe that the same requirement applies to all developing operators - development must develop further.